# The Impact of Capital Market Development on Economic Growth: Time Series Evidence from Singapore

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# ABSTRACT

Using a time series approach, this thesis investigates the impact of capital market development on economic growth using Singapore as a case study for a period of 1987 - 2019. Johansen cointegration method disclosed that there exists a long run relationship in the variables. The vector error correction model revealed the coefficient of the error correction term, which implies that in the short run the values of total value of stocks traded, trade openness, gross fixed capital formation, stocks traded, turnover ratio of domestic shares and market capitalization of listed domestic companies contribute to economic growth converging to its long run by 8.68% speed of adjustment every year. The estimated long run coefficient implies that the capital market development has a statical significant positive impact on economic growth.

**Keywords:** Capital Market Development, Economic Growth, Time Series Analysis, Johansen Cointegration

# ÖZ

Bu tez, bir zaman serisi yaklaşımı kullanarak, sermaye piyasası gelişiminin ekonomik büyüme üzerindeki etkisini, 1987 - 2019 dönemi için Singapur'u vaka çalışması olarak kullanarak araştırmaktadır. Johansen eşbütünleşme yöntemi, değişkenlerde uzun dönemli bir ilişki olduğunu ortaya koymuştur. Vektör hata düzeltme modeli, kısa dönemde işlem gören hisse senetlerinin toplam değeri, ticari açıklık, brüt sabit sermaye oluşumu, işlem gören hisse senetleri, yerli hisselerin devir oranı ve borsaya kote hisse senetlerinin piyasa değeri değerleri anlamına gelen hata düzeltme teriminin katsayısını ortaya koydu. yerli şirketler her yıl %8,68'lik uyumlanma hızı ile uzun vadeye yaklaşan ekonomik büyümeye katkı sağlamaktadır. Tahmin edilen uzun dönem katsayısı, sermaye piyasası gelişiminin ekonomik büyüme üzerinde istatistiksel olarak anlamlı bir pozitif etkiye sahip olduğunu ima etmektedir.

**Anahtar Kelimeler:** Sermaye Piyasası Gelişimi, Ekonomik Büyüme, Zaman Serisi Analizi, Johansen Eşbütünleşme

# DEDICATION

This work is dedicated to God Almighty and to all the unprivileged girl-child.

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# INTRODUCTION

## 1.1 Research Background

The relationship between global financial development and economic growth has been a source of contention among economists. Global capital mobility does contribute to long-term growth. However, such mobility has a variety of negative effects, including an increase in the local currency, changes in asset prices, and a sudden halt to foreign capital inflows. When faced with such repercussions, countries attempt to combat them by implementing macroeconomic measures like taxes and direct capital regulation. Working with other nations is the greatest method to deal with the negative effects. When comparing industrialized and less developed nations, it becomes clear that financial services are carried out safely and effectively in the former, while they are likely to be less effective in the latter. Thought must be given to the factual implications of the financial sector's impact on economic expansion. The classic work of Schumpeter (1911), in which he noted that services provided by well-developed financial institutions have an impact on productivity and growth, has spawned a vast body of literature, according to Kargbo and Adamu (2009). In addition, he asserted that financial intermediaries play a significant part in the process of fostering economic growth by providing services such as pooling risks, monitoring, and evaluating investments, and facilitating the accumulation of savings, amongst other things. According to Ouandlous (2010), the establishment of capital markets "requires time and, more importantly, cooperation between the government agencies and the private sector. “A

favorable economic and political climate, as well as the corresponding suitable institutional support for this environment, are necessary for the proper operation of the capital markets.

The capital market's primary function is to help various institutions raise money. A variety of securities will be issued in order to raise capital. Borrowing from the money market is a channel for transferring short-term or working capital. By issuing different securities, including bills, promissory notes, etc., this is accomplished. On the other hand, businesses use the issuance of shares and bonds to raise long-term cash or fixed capital. As a result, the capital market plays a crucially important role in the domestic economy. Businesses require financing from the local market. Along with cheaper pricing and longer maturities, it additionally provides alternate sources of funding. The capital market offers funding for riskier firms that regular banking does not. Additionally, the government could use funds from the local market to better manage risk and inflation. Along with the previously mentioned benefits, the capital market provides opportunities for savers and investors to earn higher returns through a range of services that lower risk and diversify portfolios, particularly for institutional investors. Better institutions are needed for faster economic growth, and these institutions need capital market financing. A nation's financial system consists of three components: a payment system, resource allocation, and risk management. In a similar vein, the financial market facilitates the exchange of assets through the capital, money, currency, commodities, mortgage, and derivatives markets. Similar to this, Levine (1997) proposed that financial intermediaries might significantly contribute to economic growth in a number of ways. Simple payment methods facilitate the exchange of products and services, channel investor resources, increase the effectiveness of savings allocation through information availability, monitor investments, and lower intertemporal risk (Caporale

et al., 2009). Several empirical studies have demonstrated that the activities of a nation's financial intermediaries contribute to the expansion of its economy. Therefore, it has been demonstrated that integration of capital markets has a favorable effect on economic growth in European Union member states (Oprea & Stoica, 2018). These assessments consider the three most significant characteristics of financial development as an engine of economic growth. The initial step is to invest your savings. The second concern is whether or not it supports economic activity, while the third is the size of financial intermediaries (Iheanacho, 2016). The purpose of this study is to investigate the connection that exists between Singapore's flourishing capital market and the country's Economic growth.

Nearly every macroeconomics textbook presents research findings and has a chapter dedicated to discussing the empirical factors that underpin economic growth. The degree of financial stability, the quality of financial institutions, the openness of trade, the amount of public spending on financial infrastructure, the volume of foreign aid and foreign direct investment, inflation, and the stage of the economy's financial development are some of the variables that are on the list. Other variables on the list include the size of the public debt and the amount of public spending on financial infrastructure. The purpose of this article is not to investigate each and every factor that may or may not have an impact on economic growth. Throughout the entirety of this presentation, the key topics of discussion will center on the rise of economies all over the world as well as the expansion of global financial markets. The goal of this paper is to analyze the available literature and empirical data around the prevailing hypotheses on the causal linkages between key measures of capital market development and economic growth, and then to examine the results of that analysis. This ob-

jective might be presented in a more concise manner. The direction of causality between the expansion of the capital market and the expansion of the economy has historically been difficult to identify and separate since both phenomena are non-stationary, dynamic processes that are influenced by a variety of conditions. According to the classic notion of the relationship between growth and development, stock and bond markets can improve capital allocation, reduce transaction costs, and stimulate technical innovation. This approach maintains that the relationship is either "Supply-Leading" (increased economic activity increases demand for capital markets) or "Demand-Leading" (increased economic activity raises demand for stock and bond markets) or "Reciprocal" (initial supply creates growth creating demand increasing supply).

It is customary to evaluate the growth of capital markets based on their size, liquidity, and volatility. It is also widely acknowledged that the expansion of capital stock, the increase in productivity, and savings are the three fundamental ways in which capital markets influence production. Capital markets are believed to promote economic growth through enhanced capital allocation, decreased transaction costs, increased risk management, incentives for technical innovation, and reduction of moral hazard issues. Additionally, economic expansion can stimulate demand by reducing the price of capital borrowing. This might occur as a result of lower information costs linked with higher levels of capital accumulation or more savings, which can result in a rise in demand. Alternatively, increasing savings might boost demand.

## 1.2 Brief Overview of Singapore

On the southernmost point of the Malaysian Peninsula, there is an island city-state called the Republic of Singapore. In a Chinese report from the third century, the island of Pu Luo Chung, which is a translated term from Malay and means "island at the

end,". This is the oldest documented mention of Singapore. The island was a little fishing community with a few hundred Malay and Chinese residents before the British arrived. The British East India Company established a trading post in 1819 that served as a port on the spice trade route. As a result, Singapore rose to prominence as one of the British Empire's most significant commercial and military hubs and the core of British influence in Southeast Asia. Singapore was occupied by the Japanese from 1942 to 1945 during World War II. Singapore won its independence from Britain after the war. As a small island republic, Singapore began to encounter significant difficulties in 1963. Unemployment, substandard housing, limited education, and a lack of natural resources and land all afflicted the economy. With the help of Dutch economist Dr. Albert Winsemius, an Economic Development Board was created. Singapore's industrial industry was promoted through the creation of national economic strategies. The economy of Singapore expanded steadily in the 1980s and rapidly in the 1990s. Singapore is one of the Four Asian Tigers, along with Hong Kong, South Korea, and Taiwan.

## 1.3 Objective of Studies

The primary purpose of this research is to assess the influence of Singapore's capital market on economic growth. To accomplish this, the paper will empirically investigate the relationships between market capitalization, all share index, and total transaction value (measures of capital market performance) and GDP over the entire time series taken, precisely, to express the trend of the capital market over time; specify the relationships between the capital market and economic growth (GDP as a substitute); and provide recommendations based on the research findings.

Other study objectives that will be investigated include:

1. To comprehend Singapore's economic development in connection to capital market development.

2. To see if there is still a link between capital market growth and economic growth.

3. Determine the nature and direction of the causal link between capital market development and economic expansion.

4. To look into how financial intermediaries influence economic growth.

## 1.4 Research Hypothesis

H0: there is no evident relationship between Capital market success and Singaporean economic growth.

H1: There is evident relationship between capital market success and Singaporean economic growth.

## 1.5 Significance of The Study

Two important themes in the current empirical literature on the relationship between the establishment of capital markets and the economic progress of emerging economies motivated this research. The investigation was prompted by these concerns. To begin with, the economic growth hypothesis claims that there is a persistent positive association between the capital market and economic growth. However, actual research on developing countries is sometimes ambiguous in this regard. The empirical research on whether or not there is a correlation between capital market growth and economic expansion is inconsistent (Osinubi and Amaghionyeodiwe 2003, Ang 2008, Enisan and Olufisayo 2009, Wang 2010). This is perplexing because, according to Singh (1997), a nation's financial system's ability to effectively promote growth is dependent not only on the structure of the system but also on the quality of the institutions

(regulatory and supervisory), the government's capabilities, and the laws. Given this information, it is unclear why this is the case.

According to the empirical findings, the precise nature of the causal relationship between the emergence of capital markets and the expansion of economies in developed countries cannot be accurately characterized. This is because the relationship is not linear. Even less is known about the circumstances that led to the interaction of these two factors in economically developing countries. The empirical literature provides different responses to the question of whether economic expansion impacts or is impacted by capital market growth (Osei 2005, Singh 2008, Soytas and Kucukkaya 2011).

# Chapter 2

# CONCEPTUAL AND THEORETICAL FRAMEWORK

## 2.1 Introduction

This chapter examines several studies involving various theories, notions, and terminologies applied by various researchers in relation to the objectives of the study.

## 2.2 Conceptual Framework

### 2.2.1 The Significance of the Capital Market to the Economic Growth

According to Levine and Zervos (1998), the capital market should encourage people to save money by offering access to a variety of financial instruments that may better match the level of risk they are willing to assume and the quantity of liquidity they require. It is feasible that the rate of savings will grow as a result of enhanced savings mobilization. Utilizing the financial markets can lower the cost of capital-raising efforts for expanding businesses. In addition, enterprises in nations with well-established capital markets rely less on bank financing, which further lessens the likelihood of a financial catastrophe. Therefore, capital markets can have a favorable effect on economic growth since they stimulate personal savings and offer firms with a source of capital. This confluence of elements contributes to economic expansion.

Kumar (1984) asserts that the capital market, either directly or indirectly, helps to the economic growth through the provision of certain services. A number of essential functions are performed by the capital market, including the collection and distribution of savings, the production of liquid assets, the diversification of risks, the enhancement

of incentives for corporate governance, and the improvement of information dissemination and the acquisition of new knowledge. Increasing the effectiveness and efficiency of these tasks through the provision of quick services can help accelerate economic growth. The capital market is the principal source of long-term capital, which is required by both the public and private sectors at every stage of a nation's economic development.

### 2.2.2 Stability of the Economy as a Whole

According to Garcia and Liu, the expansion of the capital market is dependent on the existence of a stable macroeconomic environment (1999). Informational asymmetries are exacerbated by the instability of the macroeconomy, which also renders the financial sector more prone to risk. Low and predictable inflation rates are more likely to have an impact on the development of the capital market and economic growth. When high inflation is anticipated, investors from both the domestic and international markets may be cautious to invest in the capital market. Moreover, according to Garcia and Liu (1999), the primary factors of capital market development in developing nations include macroeconomic stability, respectably high-income levels, GDP per capita, domestic savings, and domestic investments.

### 2.2.3 The Evolution of Banks Within the Financial System

According to Yartey (2007), the expansion of capital markets in developing countries is contingent on the expansion of the banking industry. During the early phases of the emergence of the capital market, the banking industry serves more as a complement than as a rival. The expansion of the financial intermediary industry may facilitate the growth of the capital market. It is vital to remember that the application of macroeconomic policies may have an impact on the current position of the financial system, in addition to the possibility that it may alter that status. The expansion of the capital

market has been significantly aided by the financial industry's provision of a variety of support services. For this reason, it is essential for there to be a dependable banking system as well as liquid interbank exchanges in order for the capital market to prosper.

### 2.2.4 Institutional Excellence

According to the International Monetary Fund (IMF, 2007), institutional quality is crucial for capital market growth. This is due to the fact that efficient and responsible institutions tend to increase investor trust and the desirability of equity investments. Consequently, stock ownership increasingly becomes more alluring as a result of the diminishing political risk over time. Consequently, the establishment of high-quality institutions has the potential to influence the desirability of equity investments and drive the expansion of the capital market. Bekaert (1995) provides data to support the premise that more political risk is related with greater levels of capital market segmentation and, as a result of this association, an unsatisfactory level of capital market development. According to research conducted by Erb et al. in 1996, there is a correlation between the level of political risk and anticipated income. They conclude that the lower the level of political risk, in both developing nations and advanced governments, the greater the likelihood of economic growth.

### 2.2.5 Security for Investors

According to the research of Shleifer and Vishny, one of the most influential factors in determining the growth of capital markets is the level of protection provided to shareholders in publicly traded corporations (1997). When comprehensive shareholder protection is in place, investors are less concerned about the loss of their investments, which increases the likelihood of the expansion of capital markets. Additionally, the ownership of these marketplaces may be somewhat spread, contributing to the market's

considerable liquidity. La Porta, Lopezde, and Shleifer (2003) utilize legislative indicators of shareholder protection as support for their assertion regarding the significance of minority rights protection. They illustrate that the effectiveness of shareholder protection is dependent on the market capitalization and liquidity of stock markets in 49 nations. Laporta et al. (1997) discovered that nations with weaker legal systems were more likely to.

## 2.3 Metrics and Standards for Measuring Economic Development and Capital Market

### 2.3.1 Indicators of Capital Market

The degree of capital market development can be determined by comparing various costs or quantities, such as interest rate spreads or stock-flow ratios, in which money or debt aggregates are evaluated against GDP.

#### 2.3.1.1 Stock Market Capitalization as a Percentage of Gross Domestic GDP

The rapid rise of the stock market has been the most influential factor in the overall rise in market capitalisation. The most important aspect in the rise of stock-flow indicators, which are used to measure the size of the financial industry, is the ratio of listed shares to GDP (Sene & Thiam, 2018). Because major corporation stocks dominate this statistic, it was suggested that two additional criteria be used to qualify the first assessment. These criteria would be used in addition to the first examination. These figures represent the total value of all trades in relation to GDP and the number of publicly traded enterprises. Market capitalization multiplied by GDP and domestic credit added to the private sector provides a figure that accurately represents the market worth of publicly traded firms (Furstenberg & Fratianni, 1996).

#### 2.3.1.2 Stocks that are Actively Traded and the Yearly Domestic Turnover Rate Expressed as a Percentage

The World Bank defines this statistic as market capitalization divided by the market value of domestically traded shares.

#### 2.3.1.3 The Total Market Value of Publicly Traded Shares Expressed as a Proportion of Total GDP

This statistic is defined by the World Bank as the total number of local and international shares traded multiplied by their most recent trading price. The important statistic, according to this definition, is the sum of all these numbers.

The total quantity of existing domestic debt instruments divided by the gross domestic product yields the private bond market capitalization. These securities could have been issued by either private or public domestic enterprises (World Bank).

Liquid Liabilities (LLY), Domestic Credit of the Private Sector to GDP (PRIVY), and (PRIVATE), which measures the ratio of claims on the Nonfinancial Private Sector to Total Domestic Credit, were also used as Quantity-based Indicators of Banking Market Development to evaluate the growth of the banking market. These three indicators are known as Quantity-based Indicators of Banking Market Growth.

### 2.3.2 Metrics that Track Economic Growth

#### 2.3.2.1 GDP: GDP (Gross Domestic Product) Per Capita

The International Monetary Fund (IMF) assesses the state of national economies as well as the global economy using GDP as a yardstick. The GDP data set provides an estimate of the total market value of all products and services produced in a country during a given time period. Economists typically use Gross Domestic Product (GDP) as a standard gauge of economic growth.

#### 2.3.2.2 Foreign Direct Investment

Sometimes shortened as "FDI," refers to equity flows arising from reported direct investment in the economy. This figure includes the sum of other capital, reinvested earnings, and equity capital. Direct investment occurs when a citizen of one economy has significant control or influence over the functioning of a company established in another economy. This type of investment is known as international investment. Ownership of at least 10% or more of the voting stock's ordinary shares is required to demonstrate the existence of a direct investment link.

#### 2.3.2.3 Trade Openness

Is defined as the share of a country's GDP that is made up of products and services exported and imported. "Trade openness" refers to the amount to which economic activity is authorized.

#### 2.3.2.4 Gross Domestic Investment

Also known as gross capital formation, is the amount of money spent on new fixed assets for the economy, as well as the difference between beginning and ending product inventories. It is a percentage of GDP and was previously known as gross capital formation. Purchase of plant, machinery, and equipment, as well as building of roads, railways, and other related projects. Fixed assets include structures and facilities that may be commercial or industrial in nature. Inventories are the stocks of items that businesses store as "work in progress" and to cover short-term or unexpected changes in output. Inventories must be kept for a variety of reasons.

## 2.4 Overview and The Evolution of Singapore Capital Market

As Singapore's financial services industry grew more complex and internationalized as both domestic financial institutions multiplied and foreign financial institutions entered, it became increasingly necessary to govern and regulate these firms and entities

in a more consolidated manner. As a direct consequence of this, the Monetary Authority of Singapore Act was enacted in 1971. This act laid the legal groundwork for the founding of the Monetary Authority of Singapore (MAS), which acted in dual capacities as a central bank and a financial regulator. In the years that followed, 1973 saw the establishment of the Stock Exchange of Singapore (SES), which opened the door for companies to participate in the equity capital market and so raise capital. 10 In order to accommodate the growing depth and breadth of Singapore's financial markets, the Singapore Exchange was subsequently formed by the demutualization of the Singapore Exchange System and the merger of that system with the Singapore International Monetary Exchange (SGX). Both the Singapore International Monetary Exchange (SIMEX) and the SESDAQ board, which allowed smaller firms to be listed, were established in 1983 and 1987, respectively. Both boards allowed for the listing of corporations. An institutional response to the spectacular growth that Singapore's financial services sector experienced during this time period was the establishment of regulatory entities such as the Monetary Authority of Singapore (MAS) and the Singapore Exchange (SGX). In order to meet the growing demand for a wider and more complex range of financial institutions, the development of trading platforms such as the SGX, SIMEX, or SASDAQ was required. Concurrently, there was a demand for regulatory organizations that could ensure market and systemic stability in the midst of such growth in the financial sector. The Monetary Authority of Singapore (MAS) was the major financial regulator, while the Singapore Exchange (SGX) played an important part in the licensing process. This was particularly true when it came to retaining control over its members and guaranteeing the legitimacy of transactions conducted on its platforms. The Central Provident Fund (CPF) Board and the Accounting and Corporate Regulatory Authority are two entities that have evolved to fulfil

regulatory functions in the financial sector. The CPF Board is responsible for managing the reinvestment of monies held in the mandated pension funds system of Singapore. In Singapore, the Accounting and Corporate Regulatory Authority regulates commercial companies, public accountants, and corporate service providers.

In the 1960s, Singapore launched a concerted effort to position itself as the central financial market for the surrounding region of Southeast Asia. It has become the most important hub for conducting the region's financial activities as a result of its forward-looking approach on the growth of the financial sector, which has resulted in it having a huge concentration of financial institutions as well as capital markets.

The financial system functions through multinational bank branches in offshore locations. Asian Currency Units refers to the nexus of international banking and foreign exchange transactions. The unification of Singapore's securities and derivatives exchanges into a single body, the Singapore Exchange, has equipped the country's capital market with the economic fortitude and intellectual energy necessary to undertake major capital investments. As a result of financial innovation and strategic alliances with foreign exchanges, efficiency will rise, and new international players will be drawn. The following is a list of current areas that have space for enhancement: As liberalization advances, domestic banks must expand to remain competitive with international banks and to overcome the restrictions of their relatively small home market. The bond market, while is more liquid than the markets in Thailand, Hong Kong, and Indonesia, still needs to develop in depth and breadth in order to be regarded successful. Hong Kong's management industry controls a substantially lesser quantity of total assets than its competitors in other locations.

In the coming years, Singapore's regional status as a superpower will be put to the test by a variety of factors.

Financial hub, as well as the emergence of new competitors such as Malaysia and Hong Kong-Shanghai, technological advancements that diminish its comparative advantage, the mix of advantages, structural changes, and growing global financial activity consolidation. Therefore, in order to keep its position as a financial leader, it must continue to make preparations, invest, and foresee future consequences. Vandenbrink et al (2005).

The unusual degree to which Singapore's economy is open to the free flow of both commerce and capital is an essential characteristic. Over the course of the past three decades, the overall value of imports and exports has been about equivalent to three times that of GDP. In order to allow a freer flow of money, nearly all capital controls and foreign exchange limits have been eliminated since 1978. Due to its small size and open structure, Singapore's economy has frequently been affected by shocks from the rest of the world. The 1996–1997 global downturn in the electronics industry, the 1997–1998 Asian financial crisis, and the 2001 burst of the information technology bubble are instances of these shocks.

Despite the economy's adaptability and the ease with which capital may be moved, Singapore has consistently maintained current account surpluses and sent money abroad.

In 1998, the Monetary Authority of Singapore made a number of significant steps to accelerate the growth of the bond market. These measures were taken. Since then, both the size and scope of the bond market in Singapore have grown.

As a direct consequence of the expansion of the bond market, the scope of the structured product market has also expanded.

Within the borders of the country, the Singapore Exchange, also known simply as SGX, is still and will continue to be the only stock exchange. A multi-asset exchange is characterized by the operation of derivatives, fixed income, and stock markets, as well as the provision of trading, clearing, data, settlement, and depository services. This market is the most significant stock exchange in Southeast Asia. As of June 30th, 2021, the total market capitalization reached $663 billion in listed shares, and it continues to expand daily. $0.99 billion in average trading value. The FTSE Straits Times Index, or STI for short, serves as the benchmark for the Singapore Exchange. The STI is a capitalization-weighted stock market index that tracks the thirty most significant Singapore Exchange-listed businesses (SGX). Over forty percent of the businesses that are listed on the Singapore Exchange have their headquarters located in a nation other than Singapore. The SGX touts itself as an offshore equity index futures exchange, comprising key Asian economies and having the highest liquidity in the world. Singapore has been identified as one of the world's most significant financial centers. Currently, Singapore is home to the world's third-largest foreign currency market, which sees daily trade worth over 640 billion dollars. Ngiam, K. J., & Loh, L. (2002).

### 2.4.1 Singapore Government Securities

Before Singaporean enterprises could use bond markets to serve their financial needs, the Singaporean government had to establish the necessary infrastructure. The development was set off by the government with the introduction of a domestic yield curve.

In order to establish a standard for corporate bonds, the government of Singapore established a plan to issue targeted Singapore Government Securities (SGS). Recently, the yield curve has been extended to the year 2015. In addition, the government implemented initiatives to expand the SGS market's number of important dealers and liquidity. The establishment of a repo facility was done so in order to make the activities of the secondary market more accessible. (Trade Chakra).

As a direct result of the government's initiatives, a thriving and liquid SGS market was established.

Both domestic statutory boards and businesses were strongly encouraged to participate in the corporate bond market in order to expedite its expansion and maximize its potential benefits.

Foreign companies were another group that was encouraged to use the bond markets denominated in Singapore dollars (S$). In order to make S$ more available to non-residents, the applicable laws have been loosened.

Since 2004, non-resident, non-financial issuers of Singapore dollar bonds and stocks are not required to convert or exchange the proceeds of their securities into other currencies prior to sending the cash abroad. This exception pertains to the transmission of funds to non-Singaporean countries.

The market for corporate bonds is demonstrating some promising new characteristics. In recent years, Singapore has become a destination for a diverse range of international issuers who wish to access the Singapore dollar bond market. (Trade Chakra)

### 2.4.2 Bond Market

The bond market in Singapore continues to be attractive to both domestic and foreign investors. As a result of possessing one of the few AAA credit ratings issued by major rating agencies, the country is regarded as one of Asia's most developed markets.

Singapore Government Securities refers to the government's debt obligations. These bonds were issued by the government of Singapore (SGS). The acronyms Treasury Bills, SGS Bonds, SSBs (Singapore Savings Bonds), and CMTBs (Cash Management Treasury Bills) designate the four main types of Singapore Government Securities (SGS) (CMTBS). The Monetary Authority of Singapore's (MAS) stated objectives for the issuance of SGS Bonds and T-bills are to build market liquidity and provide a strong government yield curve; to expand an active secondary market for cash transactions and derivatives; to achieve efficiency in risk management; and to encourage domestic and international issuers and investors to participate in Singapore's bond market. These are only a few of the objectives. Another stated objective is to achieve risk management efficiency. Sumeet (2022) (2022).

### 2.4.3 Diversity of Product

In order to provide the final customer with more options, the government encouraged research and manufacture of a wide range of items. The rise of the market for structured goods, which includes asset securitization, has been accorded special government attention.

In order to ensure that asset securitization can be exploited as an alternative means of financing, the government enacted regulations governing the capital treatment of asset securitization as well as legislation governing credit derivatives. This provides the participating financial institutions with certainty regarding the risks and duties connected with such transactions.

In addition, the government has imposed limitations on investments made by insurance companies.

As a result, insurance companies were able to use credit derivatives for portfolio management and hedging, allowing them to invest in a broader range of products.

All of the government's regulatory efforts have resulted in the establishment of a regulated and organized product market.

Examples of structured debt securities include asset backed securitization (ABS), equity linked notes (ELNs), credit linked notes (CLNs), and collateralized debt obligations (CDOs) (CDO) (CDO).

The tax law in Singapore has been liberalized in order to support the expansion of the country's capital market. (Trade Chakra).

## 2.5 Theoretical Literature

### 2.5.1 Post-Keynesian Model of Economic Growth

The Harrod-Domar (HD) model is named after the distinguishing contributions of Roy Harrod (1939, 1948) and Evsey Domar (1947) to the creation of the Neo-Keynesian theory of growth. This model is also known as the Harrod-Domar model. According to the HD model, the rate of technical advancement is determined by forces external to an organization, and the accumulation of capital plays a vital role in the expansion process. For there to be an increase in the total amount of capital stock, there must first be an increase in the total amount of capital stock over time, the model assumes (K). According to Bhagwati (1984), the model suggests that the solution to the problem of underdevelopment is as simple as increasing the amount of available resources for investment. This is the approach proposed by the model to address the issue of underdevelopment. It has been stated that the concept is problematic because it assumes constant labor and capital expenses, as well as employed ratios. Due to this assumption, it is probable that economic growth will not be adequate to maintain full employment levels.

### 2.5.2 Economic Growth Model According to Neoclassical Theory

Marshall (1898), Ramsey (1928), Solow (1956), Swan (1956), Cass (1965), and Koopmans were instrumental in the creation of the neoclassical theory of economic growth. Each of these individuals has made significant contributions to the theory (1965). If this hypothesis is accurate, the elasticity of substitution should remain constant across inputs, and the rate of return should fall as more inputs are made. The levels of worker productivity, capital stock, and technical advancements should all be

proportional to the rate of economic expansion. As a result, the law of diminishing marginal returns would result in a decrease in output if capital stock utilization rose.

It is predicated on the idea that increases in output per worker are only able to be maintained over the course of time by simultaneous increases in overall productivity.

One of the possible objections of the neoclassical growth model is that it assumes the forces that drive long-term growth are fully exogenous, or external to the model. This assumption's validity is the basis for one of the model's criticisms.

### 2.5.3 Endogenous Growth Model

It is believed that the contributions of Romer (1986), Lucas (1988), Rebelo (1991), Grossman and Helpman (1991), and Barro and Sala-i-Martin (1995), among others, were significant in the evolution of the endogenous theory of growth at various periods in its history. In the 1980s, a variety of models that endogenously explain long-term economic growth by relaxing the assumption of decreasing returns to capital and incorporating technological innovation emerged. These models account endogenously for technological advancement as an endogenous variable to explain long-term economic growth. This was done in order to make the models more relevant to the actual events that occurred. There is no correlation between technological advancements in the outer world and output or productivity gains.

Romer (1986) introduced the revolutionary concept that R&D operations are linked to externalities that have an effect on the body of information that is accessible to all enterprises. This concept was innovative at the time. This was a big step forward for the profession as a whole. A shift term (technology index), which is a function of the

information pool made available to all firms, and firm-specific variables (capital services, labor, and R&D inputs), which indicate the public-good features of activities such as R&D that generate new knowledge. No one should be surprised by the notion that "shift" could be viewed either as "learning by doing" or as the effect of the human capital pool. It is plainly clear that the endogenous development hypothesis may account for a diverse range of circumstances that inspire creative thought.

According to models of endogenous growth centered on research and development (R&D) or ideas, innovation, specifically the accumulation and dissemination of technological knowledge, is viewed as the fundamental driver of sustainable economic expansion over the long run. According to these notions, spending money on research and development will generate "ideas" (in the form of blueprints for new goods or procedures). According to these beliefs, research and development is described as an example of an entrepreneurial undertaking conducted by enterprises whose primary objective is to maximize profits. The outputs of research and development are the invention of one-of-a-kind techniques and components, which are then utilized in the manufacture of final items. These things function as inputs of a higher quality, intermediates with greater specialization, or capital products, all of which contribute to an overall rise in productivity. It has acquired a level of widespread acceptability at this time.

Research and development-driven innovation is one of the most critical determinants of a company's competitiveness. This element not only influences the company's internal performance, but it also has substantial ramifications for the company's connection with its surroundings ("R&D spillovers") ("R&D spillovers"). In addition, economic theory suggests that the global diffusion of information directly contributes to

higher levels of output and productivity. According to research conducted by Eaton and Kortum in 1996, the innovations of only three nations account for more than half of each of the 19 OECD countries in their sample's productivity gains (US, Germany, and Japan). These three nations, along with France and the United Kingdom, receive more than 10 percent of their respective GDP growth from domestic research. There are three approaches that may be utilized to explain the influence that the global diffusion of technology has had on the increase in productivity. First, the research and development operations of the participating nations become more productive as a result of access to a broader knowledge base, which fosters future productivity growth. This is among the advantages of international cooperation. As a result, the development of a nation's production is demonstrated to be positively correlated not only with its degree of openness to the flow of information, but also with its capacity to assimilate and apply foreign knowledge. During this time period, domestic research and development could aid in the expansion and maintenance of the nation's absorptive capacity. The chance to use input products of a higher grade than those produced domestically is the second advantage of engaging in foreign trade. This leads in an increase in total productivity, which is advantageous for both parties. Thirdly, it is feasible to learn about products, production processes, market circumstances, and other areas of business through engaging in international commerce or receiving direct investment from other nations. The presence of international direct investment makes this possible. Because of this learning, there is a probability that expenses associated to innovation may go down and overall factor productivity may go up.

### 2.5.4 Evolutionary Model of Economic Growth

The evolutionary perspective on growth gives light on three elements of expansion that neither the neoclassical growth model nor the endogenous expansion model takes

into account. Technological advancement must initially be viewed as a condition of disequilibrium marked by high degrees of ex ante uncertainty, route dependence, and long-term adjustment processes. Second, instead of focusing primarily on investments in research and development and human capital, growth theory should be grounded in a more realistic vision of the organization, one that emphasizes the (strategic) capabilities of the firm in a broader sense. This should be done instead of the present approach, which prioritizes investments in R&D and human capital. Thirdly, it is crucial to analyze the institutional environment, which is likely to have a substantial influence in explaining regional disparities in economic growth and must be taken into account. It should come as no surprise that the fundamental objective of the actions listed in this strategy should be to strengthen the capabilities of enterprises and organizations that promote economic growth. In addition to the operations of the European Union and the OECD, the significance of the evolutionary method is implicitly reflected in the policy discussions and design processes of other nations. Stern et.al (2000), OECD (2001).

### 2.5.5 Theories of Capital Market

The fundamental responsibility of the capital markets is to ensure that the nation's total capital stock is divided evenly among the many economic sectors. To state it in the simplest words possible, the ideal market is one in which all market participants can make informed decisions because economic activity is sufficiently transparent. From the information provided by the market at the time, it is straightforward to determine that these producers were making informed decisions, indicating that the market in question is, in essence, efficient. When producers can decide when and how much to invest, they will be able to make such well-informed judgments. Despite this, numer-

ous other schools of thought contribute to the operation of the financial markets. During the course of this investigation, we will investigate one of the financial market's presumptions.

According to Mapsofworld, "capital market theory" is an umbrella term for the analysis of numerous asset classes (2014). The basic objective of the financial markets is to create a price for each of the underlying assets that are represented by various share kinds. It is commonly regarded that the Markowitz portfolio model is the most essential conceptual building block in the field of capital markets theory. The central concept of rational decision-making by investors is the focus of capital market theory research. All investors have the same investment horizon or time horizon; there are no taxes or transaction fees; assets can be split up in a very short period of time; and all investors have identical expectations regarding the outcomes.

# Chapter 3

# EMPIRICAL LITERATURE OF PAST STUDIES

In recent years, numerous industrialized and emerging nations have performed substantial research on the relationship between the capital market and economic growth. The majority of past research, including that of Henry, revealed that the capital market, which comprises the stock and bond markets, contributes to economic growth (2000). Between 1985 and 1994, he studied the effects of capital market liberalization on private investment and economic growth in eleven developing Asian and Latin American nations. This list includes Argentina, Brazil, Chile, Colombia, India, Korea, Malaysia, Mexico, the Philippines, and Thailand. This is due to the fact that allowing international and domestic agents to share risk could reduce the cost of equity capital in the country. The second reason for spending was the belief that the marginal productivity of capital will increase in the future. This was expected to lead to an increase.

King and Levine are two researchers who have explored the relationship between the expansion of the financial sector and the expansion of the economy as a whole from a variety of perspectives. Using a range of methodologies, these academics studied the relationship between the two (1993). The study studied data from 80 nations from 1960 to 1989 and discovered that data supported Schumpeter's theory that the financial system may be responsible for economic growth. The rise of the financial sector, which encompassed the banking system and the stock market, was crucial for future economic growth, the accumulation of physical capital, and the enhancement of economic

efficiency. This was because expansion in the financial sector was necessary for growth in physical capital. This group's dominance in the United States is not surprising. Choe and Moosa found that financial deregulation and the formation of financial markets, such as the stock and bond markets, contributed to the expansion of the economy. The stock and bond markets are depicted below (1999).

According to Valle (2000), the capital market may suffer a similar flow as a result of basic economic difficulties that have the same effect on all markets and represent global financial conditions. This perspective aligns with that of Baele et al. (2004), Weber (2006), and Karolyi and Stulz (2007). (2005). (1995). Weber (2006) and Karolyi and Stulz (1995) concur that the capital market may exhibit such behavior. This discovery lends credence to Baele and his colleagues' claims (2004). The relationship between national capital markets may be transformed by deregulation and market liberalization, new communication and trading technologies, new financial commodities and services, and the increase of multinational businesses' global activities (Chay and Eleswarapu 2001). (Chay and Eleswarapu 2001).

Palac-McMiken (1997) conducted studies on how ASEAN countries' capital markets were linked between January 1987 and October 1995. This group included the Philippine, Indonesian, Singaporean, Malaysian, and Thai capital markets. Except for the Jakarta (Indonesia) Stock Exchange, all of the analyzed capital markets were interconnected, according to cointegration study. Indonesia's Jakarta Stock Exchange was unlike any other market. From 1987 to 1995, the financial industry as a whole did not function well, according to the study's conclusions.

Ho, Pham, and Nguyen (2021) explore the relationship between financial development and economic growth via trade openness in the six ASEAN nations deemed most important (Indonesia, the Philippines, Malaysia, Singapore, Thailand, and Vietnam). From 1995 to 2019, we analyzed data from an enormous number of individuals. It has been found that trade openness is a strong predictor of economic growth, whereas financial development is a less strong predictor of economic growth. There is a positive correlation between financial sector growth and economic expansion. When business is simplified, the same thing occurs. This is because vibrant financial markets might potentially contribute to a thriving economy.

Malarvizhi, Zeynali, Al Mamun, and Bin Ahmed (2019) investigate the correlation between the growth of the financial industry and the growth of GDP in a subset of ASEAN-5 nations (Malaysia, Indonesia, Singapore, Thailand, and the Philippines) between 1980 and 2011. The pertinent time period is 1980 to 2011. This information spans the years 1980 to 2011. This study aims to discover if there is a connection between financial development, economic growth, capital accumulation, and efficiency gains. The findings of the study reveal that FD has a substantial and positive effect on economic growth. However, the calculated models indicate that exports and domestic investment are more important than foreign direct investment for the economic growth of the ASEAN-5 nations (FDI).

Murinde and Eng conduct field research to evaluate two hypotheses regarding the connection between developing financial markets and expanding economies (1994). In Singapore, these ideas are debated in the context of supply-leading and demand-following finance. A bivariate vector autoregressive model (BVAR model) is one of the

statistical frameworks they apply to construct hypotheses. In this instance, an auto-regressive vector model with two variables is used. Using econometric techniques, it is possible to determine whether the Granger-causality, cointegration, and stationarity assumptions hold true. Only large volumes of money and a monetization variable can entirely replace financial progress, according to the research. These findings support the validity of the supply-led paradigm.

During the Asian financial crisis that began in 1997, Abd Majid and Mahrizal conduct an experiment to investigate the relationship between shortterm and longterm finances and the rate of economic development in the ASEAN-4 countries (2007). Southeast Asian nations and territories (Indonesia, Malaysia, Thailand, and the Philippines). There appears to be a long-term equilibrium between economic growth, financial complexity, investment proportion, and inflation, according to the ARDL models. In addition, they assert that the expansion of the financial sector and the stability of prices are the most significant factors in predicting whether the global economy will expand or decrease. The relationship between growth and finance is one-way in Malaysia, two-way in Thailand, and one-way in the Philippines, according to Granger causality tests performed on the VECM. In Thailand, growth and wealth are two sides of the same coin. In Thailand, acquiring wealth and enhancing one's abilities go hand in hand.

Cao and Quek (2010) examine the elements that contributed to Singapore's rapid economic development. They conclude that Singapore's economic success is due to a variety of variables, such as economic development, good government policies, a number of pull pressures that occur naturally, and push influences from other countries. Statistical studies, on the other hand, indicate that liberalization of the financial sector, which typically takes the shape of a drop in interest rates, does not contribute much to

the development of the financial industry. This revelation contradicts previously held beliefs.

Additionally, Karim and Karim (2012) analyzed the interconnection of the capital markets in Malaysia, Indonesia, Singapore, Thailand, and the Philippines. Before 1997, after 1997, and after the US financial crisis, the research was conducted between January 1988 and December 2010. (Subprime mortgage). This study examined the time periods preceding, during, and following the crisis. According to Karim and Karim, subprime mortgages in the United States precipitated a crisis that led to the integration of financial markets in ASEAN nations (2012). They reached these conclusions because of this crucial factor. Consistent with the findings of Robiyanto (2018), Catherine and Robiyanto (2020), and Robiyanto and Ernayani (2018), who employed the DCC-GARCH approach to study the relationship between the Indonesian capital market and those of other ASEAN and Asian nations. Catherine and Robiyanto (2020) employed this method to assess the extent to which the Indonesian capital market is interconnected with those of other ASEAN and Asian nations. They concluded, in the wake of the Asian financial crisis, that the dynamic relationship between the Indonesian capital market and ASEAN states will likely strengthen over time. This supports Robiyanto and Ernayani's findings (2018). In their investigation, Robiyanto's Rob method was used with vector autoregression (VAR). Muharam et al. (2020), who also employed the Orthodox GARCH (OGARCH) technique, reached the same conclusion. Using this methodology, they determined that the Great Recession was the worst and had the highest level of integration.

Akdogan (1995) examines the relationship between the inherent risk of an asset and its prospective investment return. This occurred in 1995. A well-integrated financial

market, according to his definition, is one in which the risk premiums of equivalent assets are the same everywhere they are exchanged. This method is distinctive in that it focuses the interaction between capital markets rather than the interaction between monetary markets or the amount of money available in each country. According to this viewpoint, the links between the capital and money markets are more important than the links between the markets themselves. According to Akdogan (1995), capital controls make it harder for capital markets to coordinate, which is a significant concern. He also considers currency exchange rates because they influence the volatility of asset returns. In 1995, Bekaert and Harvey present an argument similar to ours. When assets with the same level of risk have the same expected return regardless of where they are exchanged, markets are said to be adequately integrated. According to the authors, markets that are not connected to the global market engage with it less effectively. This is owing to the fact that leveraging interconnected global markets can result in the anticipated profits. We believe that the notions developed by Akdogan, Bekaert, and Harvey in 1995 provide the clearest and most accurate account of how capital market integration happens. Recent works by Choudary, Siag, and Lehkonen, among others, reveal and explain the pervasiveness of these views in current culture. Since they are the primary source of liquid cash and capital that facilitate the quick generation of new capital, capital markets play a crucial role in boosting economic productivity and efficiency (Atje and Jovanovic, 1993; Levine and Zervos, 1993, 1998; Rousseau and Wachtel, 2000; Caporale, Howells and Soliman, 2004; Beck and Levine, 2005). Emerging markets are new markets that have expanded as the world has become more interconnected and as economic and investment barriers have diminished. Consequently, so-called "developing markets" have emerged. These markets are still in their infancy, hence the phrase "emerging markets." As emerging markets grow

more financially interconnected, the amount and frequency of volatile capital flows may increase, according to one theory. Microeconomic issues have a significant impact on stock prices, according to Menkhoff, Sarno, Schmelling, and Shrimpf (2012), McKinnon (2013), Gua and Huang (2010), and Schwert (1989). It is currently unknown what the organization hopes to achieve in the future. Rapach and Weber examined the use of global macroeconomic indicators for predicting capital market volatility (2004). They were able to achieve their objective by combining data from twelve developed nations. This study reveals that INTR is the most important indication of the overall health of the economy. Therefore, it should not come as a surprise. Wu and Lee's (2015) investigation into the predictability of the relationship between macroeconomic data and capital market volatility is strikingly similar to our findings. Finally, they discovered that these variables had a substantial effect on the volatility of stock prices. Some indicators, including INTR, ER, INF, and PI, do not alter appreciably over time or across international borders. Using data from the United States, the United Kingdom, Germany, France, and Japan, Duca (2007) explored how the capital market affects GDP growth. The findings lend credence to the view that the capital market is an essential element of national progress. Comparable research was undertaken by Caporale et al. in 2009. They used the Co integration test to examine whether or not there was a link between growing capital markets and growing GDP in 10 countries that are members of the EU. Their findings demonstrate a causal connection between the factors they analyzed. Recent global expansion of stock trading systems is another proof of the capital market's importance to economic progress (Yartey & Adjasi, 2007). They are Yartey and Adjasi (2007). At its most fundamental level, the capital

market functions similarly to the "central nervous system" of the economy. The direction of the capital market index affects many parts of the economy, including how much individuals consume, save, and invest.

Because we utilized EGARCH-dynamic conditional correlations, we were able to: Narayan et al. (2014) explored the relationship between the capital markets of Asian countries just beginning industrialization and those of developing nations (DCC). Even during the economic crisis, the survey indicated that good relationships were preserved. Capital market integration is influenced by the global financial crisis, economic ties between nations, an openness variable, and domestic market features, according to additional research.

Kose et al. (2003) explored the relationship between capital market fluctuations and international trade. They discovered that the data did not support the idea that there is a positive relationship between the two. There was no association that was statistically significant between the two variables. In a study undertaken by Bracker and his colleagues in 1999, it was shown that a range of factors had a major impact on the movement of the capital market. One of these problems is the enormous difference between the two markets. Another factor is the potential volume of trade between the two countries.

Between 1980 and 2004, Tang et al. analyzed what they perceive to be a correlation between the expansion of capital markets and the growth of economies in the Asian-12 countries as a whole. (2007). According to their findings, just four of the twelve countries (China, the Philippines, Singapore, and Taiwan) indicate a long-term correlation between capital market growth and economic expansion. Twenty years were

spent investigating the relationship between the two people. Only in China, Hong Kong, Indonesia, Malaysia, and Thailand is the relationship between capital markets and economic growth bidirectional, as determined by the Granger causality test. [Root causes and repercussions] Japan and Korea's economies, on the other hand, grow more rapidly because their capital markets have a short-term, unidirectional effect on their economies, resulting in a quicker rate of economic expansion. The effect is directly attributable to the fluctuation in stock prices. Unlike India and Singapore, the Sri Lankan capital market does not rise in tandem with the economy. This link is unavailable to Singapore and Sri Lanka at this time.

In the United States, Jiang (2019) observed a strong association between economic growth and stock returns, but this correlation is less but still present in China. In the United States, this connection is stronger than in China. In contrast, Cave et al. (2019) reported on their investigation and reached the opposite conclusion. Between 1990 and 2014, researchers analyzed 101 nations to determine if there was a correlation between the banking industry and economic growth. In addition, they highlighted the close correlation they identified between rising capital markets and overall economic prosperity in these nations.

Osaseri and Osamwonyi (2019) discovered a correlation between the growth of BRIC capital markets and GDP. This was revealed when Kapaya (2020) analyzed the correlation between the growth of Tanzania's capital market and its gross domestic product from 2001 to 2019. He believes that in the long run, everyone will benefit if the capital market grows. However, economic development decreases market liquidity both temporarily and permanently. Abbas et al. (2016) discovered no correlation between the capital market and economic expansion. The findings of this study, on the other hand,

indicate that the capital market currently contributes more to the growth of Tanzania's economy. Abbas et al. (2016) were unable to detect a correlation between the capital market and economic growth. This is due to the fact that the most recent study revealed no correlation between capital market expansion and economic expansion.

# Chapter 4

# DATA AND METHODOLOGY

This chapter defines the data used in this dissertation, examines the econometric model, illustrates the methodology, and describes the data's characteristics.

## 4.1 Data Source and Nature

I employed Secondary source annual time series data from the world bank's Development Indicators.

## 4.2 Series

- Real GDP per capita (constant 2015 US$)
- Market capitalization of listed domestic companies (% of GDP)
- Gross fixed capital formation (constant 2015 US$)
- Stock Trade, total value (% of GDP)
- Stock traded, turnover ratio of domestic shares (%)
- Trade (% of GDP)

## 4.3 Model Specification

According to this thesis, the pace of economic growth is a linear function of the total value of stocks traded, the extent to which trade barriers are eliminated, the quantity of money invested, the turnover ratio of stocks, and the market capitalization.

$$lnGDP = f(lnTVST, lnTR, lnGFCF, lnTRST, lnMCAP) \quad (1)$$

From equation 1 the model will be expressed in Econometric form.

$$lnGDP = B0 + B1(lnTVST) + B2(lnTR) + B3(lnGFCF) + B4(lnTRST) + B5(lnMCAP) + u. \quad (2)$$

GDP is the real gross domestic product of the United States in 2015; TVST is the total value of stocks traded as a percentage of GDP; TR is trade openness (trade as a percentage of GDP); GFCF is gross fixed capital formation; TRST is stocks traded as a percentage of the turnover ratio of domestic shares; and MCAP is the market capitalization of domestic companies that are listed as a percentage of GDP. All of the data have been transformed logarithmically throughout because we want to make our data to be normally distributed and also for easy interpretation of our result.

## 4.4 Methodology

### 4.4.1 Unit Roots Approach Tests

When conducting time-series analysis, it is essential to confirm that your variables are stationary and begin with unit root testing. This is because if one or more of the variables are non-stationary (have a unit root), shocks to the system will not dissipate gradually, which could lead to misleading regressions. This is because of the fact that shocks to the system will not fade away gradually. In addition, in the presence of non-stationarity, the t-statistics will not adhere to the t distributions and the F-statistics will not adhere to the F distributions, resulting in inaccurate results from hypothesis testing.

Traditional unit root tests and those of the second generation are utilized frequently. The augmented Dickey-Fuller (ADF) and Philips-Perron (PP) classic unit root tests will be used to determine whether or not the variables and their orders of integration are stationary. Each of these assessments will employ all three of these models. In this article, three different types of models are considered: the general model including

both the trend and the intercept, the model that just considers the intercept, and the null model (the model with neither trend nor intercept). In the present investigation, the following hypotheses are being tested:

The null hypothesis states that the variable in question does not have a unit root and makes that assumption as its starting point (H0) (the value of the variable does not remain constant).

On the other hand, the variable in question does not have a unit root (H1) (which indicates that the variable is stationary) (the variable is stationary).

Each variable's stationarity has been examined using both its level form and its initial difference, as confirmed. When employing conventional econometrics, the appropriate time-series methodology is highly dependent on the outcomes of unit root tests and the sequence of integration of the investigated variables. Every variable is regarded as integrated of order zero (I (0)) if and only if its level forms do not change while it is represented by them. For the objective of identifying the causal relationships between the variables as a function of time, the basic regression technique employing ordinary least squares (OLS) should be utilized in this case. If a variable has a unit root, it is said to be integrated of order one (I (1)) (that is, if they are non-stationary at their level forms and stationery at their first differences). In such a circumstance, the three-step Johansen method is the best option. If the order of integration across variables is inconsistent, the autoregressive distributed lag (ARDL) bounds test method should be applied.

This dissertation's unit-root tests indicated that all variables were integrated at the first-order level (see results in Chapter 5). In light of this, Johansen's three-step strategy has been implemented.

### 4.4.2 Johansen's Cointegration

This begins with the estimation of an unconstrained standard vector autoregressive (VAR) model. Johansen's test for cointegration is the second stage, followed by estimate of a vector error correction model (VECM).

#### 4.4.2.1 Vector Autoregressive (VAR) Model

In the first step of this procedure, Johansen estimates a regular, restriction-free vector autoregressive (VAR) model. This VAR model is employed in order to estimate the vector error correction model and conduct the Johansen cointegration test (VECM). Both the Johansen cointegration test and the Vector error correction model are quite sensitive to the lag length used in the study. Information metrics such as the Akaike Information Criterion (AIC), the Schwarz Information Criterion (SC), the Hannan-Quinn Information Criterion (HQ), and the Final Prediction Error are used to determine the best lag time for the estimated VAR model (FPE). If you wish to have confidence in the VAR model's selection of the optimal lag length, you must verify the model's stability by examining the autoregressive (AR) roots graph and table. This will allow you to trust the VAR model's selection of the optimal lag length. The second step of Johansen's technique is to conduct Johansen's cointegration test after determining that the VAR model is stable and selecting the proper leg length. Following these two phases, the procedure is complete.

#### 4.4.2.2 The Johansen Cointegration

In the second phase of Johansen's methodology, the Johansen cointegration test is used to determine whether or not the variables have a long-term relationship (that is, to

check if there is cointegration between the variables). It is necessary to have cointegration because, if the variables are not cointegrated, we can only establish short-run correlations. Therefore, cointegration is crucial. Since our purpose is to provide policy suggestions, we are particularly concerned with the long-term relationships. The linear combination of the non-stationary (unit root) variables must be stationary for cointegration to be valid over the long term.

When doing a cointegration test using the Johansen method, both the highest eigen value and the trace test statistic are required. Several hypotheses will be tested throughout this experiment, including the following:

H0: There is no cointegrating equation

H1: There is at least one cointegrating equation

H0: There is at most one cointegrating equation

H1: There are at least two cointegrating equations

H0: There are at most two cointegrating equations

H1: There are at least three cointegrating equations

H0: There are at most three cointegrating equations

H1: There are at least four cointegrating equations

H0: There are at most four cointegrating equations

H1: There are at least five cointegrating equations

H0: There are at most five cointegrating equations

H1: There are at least six cointegrating equations

Methodically and sequentially, the null hypotheses are probed until it becomes evident that they cannot be disproven. A thorough tally of the cointegrating vectors, also known as equations, will be conducted at this stage. If we discover at least one cointegrating equation, we know that the variables of interest are interconnected over time.

The variables in our analysis were discovered to be cointegrated (see results in chapter 5). As a direct outcome of this, the third and final step of Johansen's approach, which consisted of the estimation of a vector error correction model, was successfully done (VECM).

#### 4.4.2.3 Vector Error Correction Model (VECM)

The Johansen method has three stages total, and the third one is the estimate of a vector error correction model (VECM). You will receive the short run and long run (cointegrating) coefficients of the explanatory variables as well as the coefficient for the error correction term at this step of the analysis (ECT). The short run coefficients reflect the effects of the regressors during the short term, whilst the long run coefficients reveal the influences of the regressors on the dependent variable over the long term. Both sets of coefficients are used in regression analysis. The long run coefficients represent the long-term effects of the regressors on the dependent variable. Following a short-run shock, the coefficient of the error correction term represents the pace at which the dependent variable returns to its long-run equilibrium level. This rate is often referred to as the "recovery rate" (ECT). For the vector error correction model (VECM) to be useful for constructing long-run correlations, the error correction component's coefficient must be statistically significant and negative.

### 4.4.3 Granger Causality Test

In conclusion, the Granger-causality test will be conducted to assess the direction of the short- and long-term relationships between the variables. This will reveal if the relationships between the variables are unidirectional, bidirectional, or multidirectional, so shedding light on the nature of those relationships.

# Chapter 5

# RESULTS AND ANALYSES

## 5.1 Preliminary Evidence (Time Series Plots)

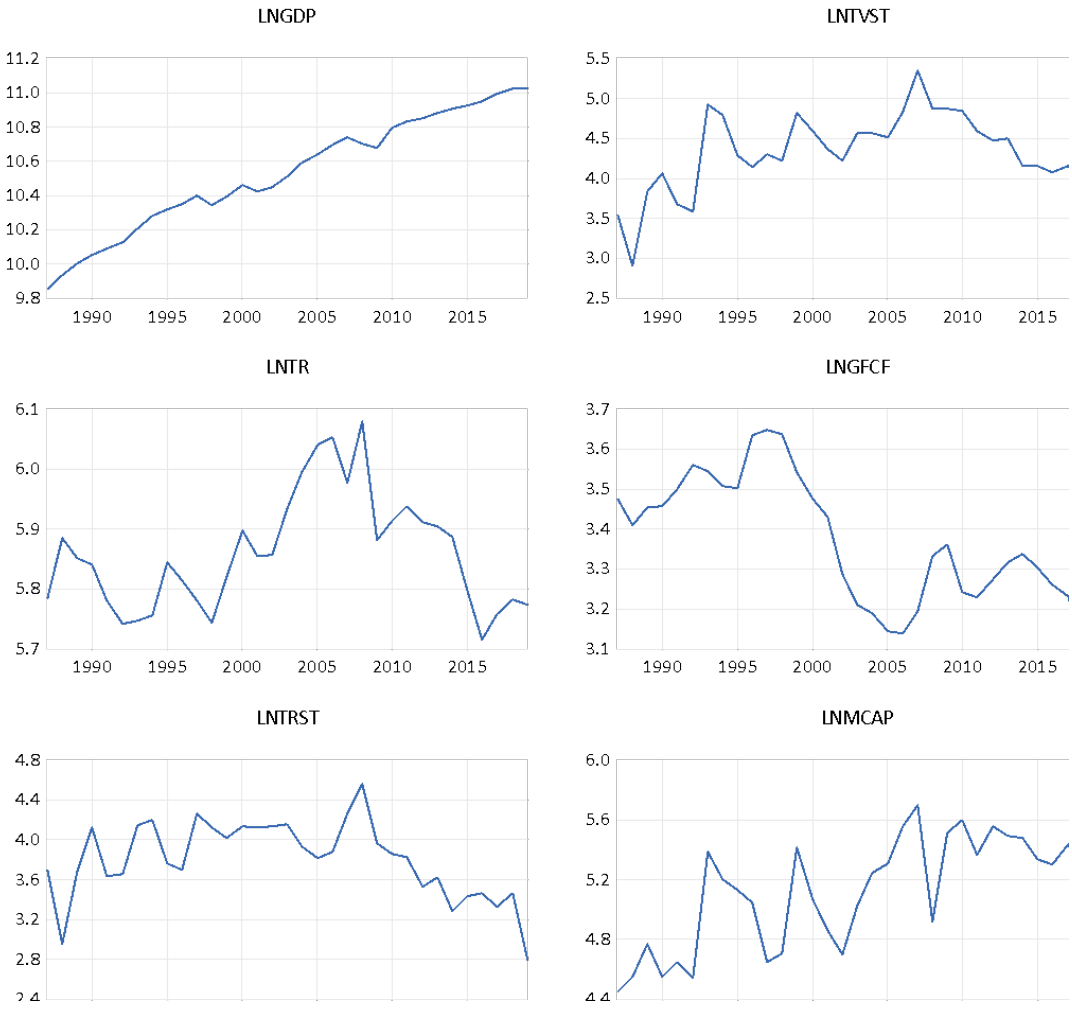


Figure 1: Time Series Plots

From the graphs, we notice that the GDP, TVST, and MCAP series have average upward trends, the GFCF series has an average downward trend, while the mean values

of the TR and TRST series are pretty stable. As a result, the following hypotheses are formulated:

H1: Total value of stocks traded has an average positive impact on economic growth in the long run

H2: In the long run, the market capitalization of listed domestic companies has an influence that is, on average, positive on economic growth.

H3: Investment has an average negative impact on economic growth in the long run

H4: Trade openness has no statistically significant impact on economic growth in the long run

H5: Stocks traded as % of turnover ratio has no statistically significant impact on economic growth in the long run

The signs that are to be expected of the coefficients are given as follows in Table 3:

Table 1: Apriori Expectations

| Variable | Expected impact on economic growth (lnGDP) |
|---|---|
| lnTVST | Positive |
| lnTR | Positive |
| lnGFCF | Negative |
| lnTRST | Insignificant |
| lnMCAP | Insignificant |

## 5.2 Empirical Evidence

### 5.2.1 Tests for Unit Root

Table 2: Unit Root Test Results

| **LEVEL FORM** | **lnGDP** | **lnTVST** | **lnTR** | **lnGFCF** | **lnTRST** | **lnM-CAP** |
|---|---|---|---|---|---|---|
| ADF (trend and intercept) | -3.06 | -2.06 | -1.76 | -2.82 | -2.82 | -2.07 |
| ADF (intercept only) | -1.96 | -2.45 | -1.93 | -1.35 | -2.58 | -2.06 |
| ADF (neither trend nor intercept) | 5.39 | -0.31 | -0.06 | -0.97 | -1.01 | 0.24 |
| PP (trend and intercept) | -3.01 | -1.54 | -1.72 | -1.73 | -2.82 | -2.99 |
| PP (intercept only) | -2.57 | -2.21 | -1.90 | -0.77 | -2.62 | -1.99 |
| PP (neither trend nor intercept) | 5.26 | -0.25 | -0.06 | -0.86 | -0.85 | 0.99 |
| **FIRST DIFFERENCE** | **lnGDP** | **lnTVST** | **lnTR** | **lnGFCF** | **lnTRST** | **lnM-CAP** |
| ADF (trend and intercept) | -5.43* | -6.97* | -6.53* | -3.90** | -7.70* | -5.88* |

| | | | | | | |
|---|---|---|---|---|---|---|
| ADF (intercept only) | -5.10* | -6.35* | -6.62* | -3.88* | -7.22* | -5.90* |
| ADF (neither trend nor inter-cept) | -3.37* | -6.45* | -6.72* | -3.91* | -7.34* | -5.93* |
| PP (trend and in-tercept) | -5.78* | -15.80* | -6.58* | -3.84** | -14.07* | -20.16* |
| PP (intercept only) | -5.26* | -6.44* | -6.64* | -3.82* | -7.06* | -13.35* |
| PP (neither trend nor intercept) | -3.29* | -6.53* | -6.72* | -3.89* | -7.20* | -9.55* |
| ***NOTE: ADF is the augmented Dickey-Fuller unit root test, while PP is the Phillips-Perron unit root test. *, **, and *** denote the rejection of the null hypothesis at the 1%, 5%, and 10% levels of significance, respectively*** | | | | | | |

For the ADF and PP unit root tests, the hypotheses are as follows:

Null hypothesis (H0): The variable has a unit root (variable is non-stationary)

Alternative hypothesis (H1): The variable is stationary

Table 4 illustrates that all of the variables are, in the vast majority of instances, integrated of order one, which is denoted by the letter I. (1). In other words, they have a tendency to remain stationary at their first differences, but when they are at their level forms, they are no longer stationary. This is because the probability values of the test

statistics for all of the variables, when using all three models – the general model with trend and intercept, the intercept-only model, and the none model (the model with neither trend nor intercept), for both the ADF and PP unit root tests, are generally greater than 10% (the test statistics are generally less negative than the critical values or they are positive) in the case of the level forms of the variable. This is due to the general model with trend and intercept, the intercept- Also, for all of the variables, the probability values of the test statistics for the ADF and PP unit root tests are generally less than 10% (the test statistics are generally more negative than the critical values) for the case of the first differences of the variables. Also, for all of the variables, the probability values of the test statistics for the ADF and PP unit root tests are generally less than 10%. This is due to the fact that the reason for this is due to the fact that the reason for this is due to the fact that the reason for this is due to the fact that the reason for this is due to the fact that the reason for this is due to the fact that the reason This leads us to believe that we should dismiss the general model with trend and intercept, the model that focuses just on the intercept, and the model that does not include an intercept at all (the model with neither trend nor intercept). The model that does not have either a trend nor an intercept is the generic model that has both a trend and an intercept.

After it was determined that all of the variables are normally integrated of order one (I(1)), Johansen's technique, which consists of three steps, was chosen as the method to use for analyzing the data. This decision was made after it was established that all of the variables are normally integrated of order one.

### 5.2.2 Johansen's Cointegration

The three-step Johansen's co-integration entails the estimation of an unrestricted standard vector autoregressive (VAR) model, the running of Johansen cointegration test, and the estimation of a vector error correction model (VECM).

#### 5.2.2.1 Vector Autoregressive (VAR) Model

Table 3: Optimal Lag Length Selection

| Lag Order | FPE | AIC | SC | HQ |
|---|---|---|---|---|
| 0 | 5.88e-12 | -8.831924 | -8.551684 | -8.742273 |
| 1 | 1.53e-14 | -14.83698 | -12.87531* | -14.20943 |
| 2 | 2.53e-14 | -14.64892 | -11.00581 | -13.48346 |
| 3 | 6.09e-15* | -17.06797* | -11.74342 | -15.36460* |
| ***NOTE: Final prediction error, Akaike information criterion, Schwarz information criterion, and Hannan-Quinn information criteria are abbreviated as FPE, AIC, SC, and HQ, respectively.*** | | | | |

For the purpose of the Johansen test for cointegration and the estimation of the VECM, the standard VAR model is used in order to ascertain the most appropriate value for the leg length parameter. The information criteria utilized to establish the proper lag time, which is subsequently determined, are presented in Table 3.

Table 3 shows that lag order 3 is the most often used lag order. As a result, the best lag length is 3. The ideal lag length of 3 will be employed in the Johansen cointegration test. A lag period of one to two will be employed to estimate the VECM. This is because the lag interval to be applied for estimating the VECM is the ideal leg length minis 1. The stability of the VAR model is shown in figure 2.

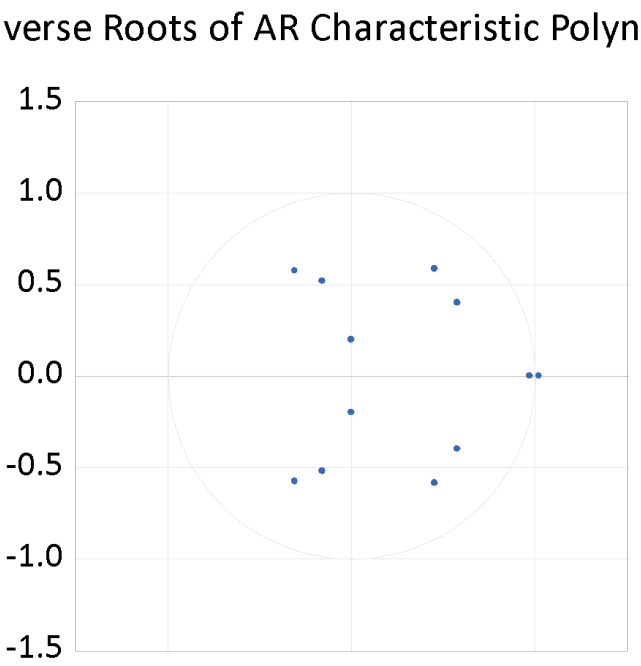


Figure 2:Characteristic Roots of VAR Model

Figure 2 demonstrates that none of the typical roots lie entirely outside the unit circle. We thus have trust in the VAR model's determination of the appropriate lag duration.

**5.2.2.2 Johansen Test for Cointegration**

Table 4: Johansen Cointegration Test Results

| Null Hypothesis | Trace Test Statistic | Maximum Eigen Value |
|---|---|---|
| None | 197.7409** | 93.95642** |
| At most 1 | 103.7845** | 41.23585** |
| At most 2 | 62.54861** | 25.78813 |
| At most 3 | 36.76049** | 16.73318 |
| At most 4 | 20.02730 | 11.63667 |
| At most 5 | 8.390637 | 8.390637 |
| ***NOTE: ** denotes the rejection of the null hypothesis at the 5% level of significance*** | | |

In the Johansen Test for Cointegration, a lag length of three is considered to be best for the purposes of determining the number of cointegrating equations (vectors) that are present and determining whether or not there is a long-run equilibrium correlation between the variables. The findings are shown in Table 4.

The maximum Eigenvalue as well as the Trace test statistic are both utilized in the Johansen Test for Cointegration. You will find information on the null and alternative hypotheses in the section labeled 4.4.2.2. After each of these sets of null and alternative hypotheses has been examined, the next batch is brought up until the point where the null hypothesis can no longer be rejected. At this point, the precise number of equations that cointegrate can be determined. The findings are shown here in Table 4.

The alternative hypothesis that there is at least one cointegrating vector is accepted, whereas the null hypothesis that there is no such thing as a cointegrating vector is shown to be rejected by the Trace test statistic when the significance level is set at 5%. The alternative hypothesis that there is at least one cointegrating vector is accepted. As a result, the following set of hypotheses will be investigated. At the same 5% level of significance, the alternative hypothesis of at least two cointegrating vectors is accepted, whilst the null hypothesis of at most one cointegrating vector is rejected. Neither of these results is surprising. Again, the null hypotheses of at most two and at most three cointegrating vectors are rejected at a significance level of 5% because there exist at most two and at most three cointegrating vectors. At the 5% significance level, however, we are unable to conclude that the null hypothesis that there are no more than four cointegrating equations is false. As a direct result of this, we have arrived to the conclusion that there are four cointegrating equations.

At a significance level of 5%, the alternative hypothesis that there is at least one cointegrating vector is accepted. On the other hand, the null hypothesis that there is no cointegrating equation is rejected. This is done by using the Eigenvalue that is the highest. Next, the alternative hypothesis that there are at least two cointegrating vectors is accepted at a significance level of 5%, whereas the null hypothesis that there is at most one cointegrating vector is rejected. the null hypothesis of there is no more than two cointegrating vectors is rejected at 5% significant level. we then discovered that there are two cointegrating equations by basing this on the maximum Eigenvalue

Because at least one cointegrating equation has been found using the Trace test statistic and the maximum Eigenvalue, it is reasonable to conclude that our variables are cointegrated in the long run and will converge to an equilibrium value. This is because the Trace test statistic and the maximum Eigenvalue were used in the analysis.

The Vector Error Correction Model (VECM) is used to estimate the long-run and short-run coefficients of the independent variables and the coefficient of the error correction term (ECT). The ECT represents the rate at which the dependent variable adjusts to its long-run equilibrium level following a short-run shock. The VECM allows for the examination of both long-term and short-term relationships between the variables, and it enables the estimation of the speed of adjustment to long-run equilibrium.

The VECM is estimated using the estimated cointegrating vectors obtained in the previous stages of Johansen's procedure. The long-run coefficients of the independent variables represent the long-run relationship between the variables, while the short-run coefficients represent the short-term relationship. The ECT, which represents the speed of adjustment to long-run equilibrium, is also estimated.

By examining the long-run and short-run coefficients and the ECT, it is possible to gain insight into the dynamic relationship between the variables and the speed at which the system returns to its long-run equilibrium following a shock. This allows for a more comprehensive understanding of the relationship between the variables and economic growth, and it can inform policy decisions aimed at promoting economic growth.

#### 5.2.2.3 Vector Error Correction Model (VECM)

The VECM is estimated to correct for any short-run deviation in economic growth away from its long-run equilibrium level. The results are shown in Table 5.

Table 5: Vector Error Correction Output

| Variable | Long-run coefficient | Short-run coefficient |
|---|---|---|
| lnGDP | - | - |
| lnTVST | 13.13868* | -1.072968 |
| lnTR | -1.854932* | 0.003348 |
| lnGFCF | -0.561107* | 0.001329 |
| lnTRST | -12.73627* | 1.017586 |
| lnMCAP | -13.94783* | 1.175797 |
| ECT | - | -0.086832* |
| ***NOTE: ECT stands for error correction term. * denotes the statistical significance of the coefficient*** | | |

Table 5 shows the findings of the vector error correction model estimate (VECM). Regarding short-run relationships, all coefficients are statistically insignificant, since the absolute values of all t-statistics fall below the crucial t value (which is 2, according

to the rule of thumb). Therefore, none of the independent factors has a statistically significant effect on short-term economic growth.

All coefficients in the long run are statistically significant. This is due to the fact that the absolute values of all t-statistics exceed the critical t value (which, according to the rule of thumb, is 2). Therefore, all independent factors have a statistically significant effect on long-term economic growth. The estimated equation for the long term is provided in equation 3.

$$\ln GDP = -4.38 - 13.14(\ln TVST) + 1.85(\ln TR) + 0.56(\ln GFCF) + 12.74(\ln TRST) + 13.95(\ln MCAP) \quad (3)$$

The signs of the coefficients are reversed in order to properly understand the long-run effects of these coefficients on economic growth. As a result, TR, GFCF, TRST, and MCAP all have long-term effects that are beneficial to the growth of the economy, whereas TVST has a long-term effect that is negative to the economic growth of the country.

If the impacts of TR, GFCF, TRST, and MCAP are maintained constant, a 1% rise in TVST will lead to an average 13.14% decline in GDP in the long term. This prediction is based on the assumption that these other factors will not change. This is based on the assumption that all other factors remain the same. If the impacts of TVST, GFCF, TRST, and MCAP are maintained constant, a 1% rise in TR will lead to a 1.85% average increase in GDP in the long term. This is assuming that the effects of these other factors will not change. This is based on the assumption that the influence of these other factors won't shift over time. If the impacts of TVST, TR, TRST, and MCAP do

not change, a 1% rise in GFCF will result in a 0.56% average gain in GDP in the long term. This is assuming that these other factors will continue to have the same effects. This is based on the assumption that these other aspects will not change. If the impacts of TVST, TR, GFCF, and MCAP do not change, a 1% rise in TRST will lead to a 12.74% average increase in GDP in the long term. This is assuming that these other factors will continue to have the same effects. This is based on the assumption that the TVST, TR, GFCF, and MCAP will not change. If the effects of TVST, TR, GFCF, and TRST do not change, a 1% increase in MCAP will lead to a 13.95% average growth in GDP in the long term. This is assuming that these other factors will not change. This is based on the assumption that these other factors will continue to have the same impact.

The VECM functioned extremely effectively, and due to the fact that it is so successful, it is appropriate for use in identifying long-run relationships. As a consequence of this, the outcomes that were covered earlier in the discussion are both reliable and valid.

This is due to the fact that the absolute value of the coefficient of the error correction term (ECT) is less than 1, as well as the fact that it has a negative value and is statistically significant (-0.09). After a short-run shock, the rate at which economic growth returns to its long-run equilibrium value is represented by this coefficient of the ECT. It is implied that short-run values of TVST, TR, GFCF, TRST, and MCAP contribute to economic growth converging to its long-run equilibrium level at an average speed of adjustment of approximately 9% per year. This is due to the fact that economic growth will eventually reach its long-run equilibrium level.

#### 5.2.2.3.1 Analysis and Interpretation of the Results

Stocks traded (percent of GDP), market capitalization, investment, trade openness, and stocks traded (percent of turnover) have been found to have statistically significant negative, positive, positive, and positive effects, respectively, on economic growth over the long term. Stocks traded (percent of turnover) has also been found to have a positive effect on economic growth. The majority of these findings may be rationalized and understood with ease.

It makes sense that there is a positive correlation between total market capitalisation and overall economic expansion. When a company has a large market capitalization, this indicates that the number of outstanding shares is high and/or that the share price is high. If the price of the share remains high, existing shareholders who want to sell their holdings may be able to realize significant capital gains. Additionally, in comparison to the standard income tax, the tax on capital gains is not very high. As a result, the existing shareholders will see an increase in their after-tax wages, as well as an improvement in their standard of life. In addition, higher market capitalizations indicate that the companies are extremely valuable. This will pique the interest of more investors, leading to an increase in the amount of capital raised by the companies. The companies can utilize these funds to invest in more initiatives, which will ultimately be beneficial to the growth of the economy as a whole.

It shouldn't come as a surprise that investments have a beneficial influence on economic growth. Increasing investments will lead to a rise in revenue, which, in turn, will lead to an improvement in living standards and economic development.

It is plausible to assume that there is a positive correlation between increased trade openness and increased economic growth. If there is an increase in output, there will also be an increase in commerce (exports). The expansion of international trade, which has an impact on the balance of payments as well, will lead to an increase in income from other countries, which in turn will lead to an improvement in living standards and economic expansion.

### 5.2.3 Granger Causality Test

In conclusion, the Granger causality test was performed, and the findings are summarized in Table 6. This allowed for an estimation of the directions of the long-run and short-run correlations that exist between the variables.

Table 6: Granger Causality Test Results

| | Dependent variable | | | | | |
|---|---|---|---|---|---|---|
| | D(lnGDP) | D(lnTVST) | D(lnTR) | D(lnGFCF) | D(lnTRST) | D(lnM-CAP) |
| D(lnGDP) | - | 1.369198 | 1.859321 | 1.413426 | 0.880978 | 4.513450 |
| D(lnTVST) | 1.910225 | - | 1.993442 | 15.03251** | 3.728878 | 8.526900** |
| D(lnTR) | 0.001695 | 0.951465 | - | 4.638845*** | 2.162242 | 5.920773*** |
| D(lnGFCF) | 0.247057 | 2.033656 | 2.268825 | - | 1.105607 | 3.658854 |
| D(lnTRST) | 1.766585 | 3.994085 | 2.003512 | 14.84164** | - | 8.428176** |

| | | | | | | |
|---|---|---|---|---|---|---|
| D(lnM-CAP) | 2.203931 | 4.128414 | 2.326593 | 14.73109* | 3.403505 | - |
| All variables combined | 25.74011* | 6.541332 | 25.75215* | 22.00490** | 13.37905 | 13.61613 |
| ***NOTE: *, **, and ***indicate that the null hypothesis was shown to be rejected at the levels of significance of 1%, 5%, and 10%, respectively.*** | | | | | | |

For the Granger causality test, the hypotheses are as follows:

Null hypothesis (H0): A variable does not Granger-cause another variable

Alternative hypothesis (H1): A variable Granger-causes another variable

Granger causality demonstrates whether lagging values of one variable can explain the current value of another variable. Short-run Granger causalities exist between lnGFCF and lnTVST, lnGFCF and lnTR, lnGFCF and lnTRST, lnGFCF and lnMCAP, lnMCAP and lnTVST, lnMCAP and lnTR, and lnMCAP and lnTRST, as shown in Table 6. All of these Granger causalities are short-run unidirectional.

Granger causalities. With respect to the research question of this thesis, none of the independent variables Granger-causes economic growth in the short-run.

In the long-run, as seen from Table 6, there are long-run Granger causalities running from all the other variables to lnGDP, lnTR, and lnGFCF. With respect to the research

question of this thesis, all the independent variables combined, Granger-cause economic growth in the long-run.

### 5.2.4 Variance Decomposition

The variance decomposition results are shown in Figure 3. The graphs are self-explanatory. They show the various contributions of each of the shocks to the independent variables, as well as shocks of the dependent variable itself, on the change in the variance of the dependent variable.

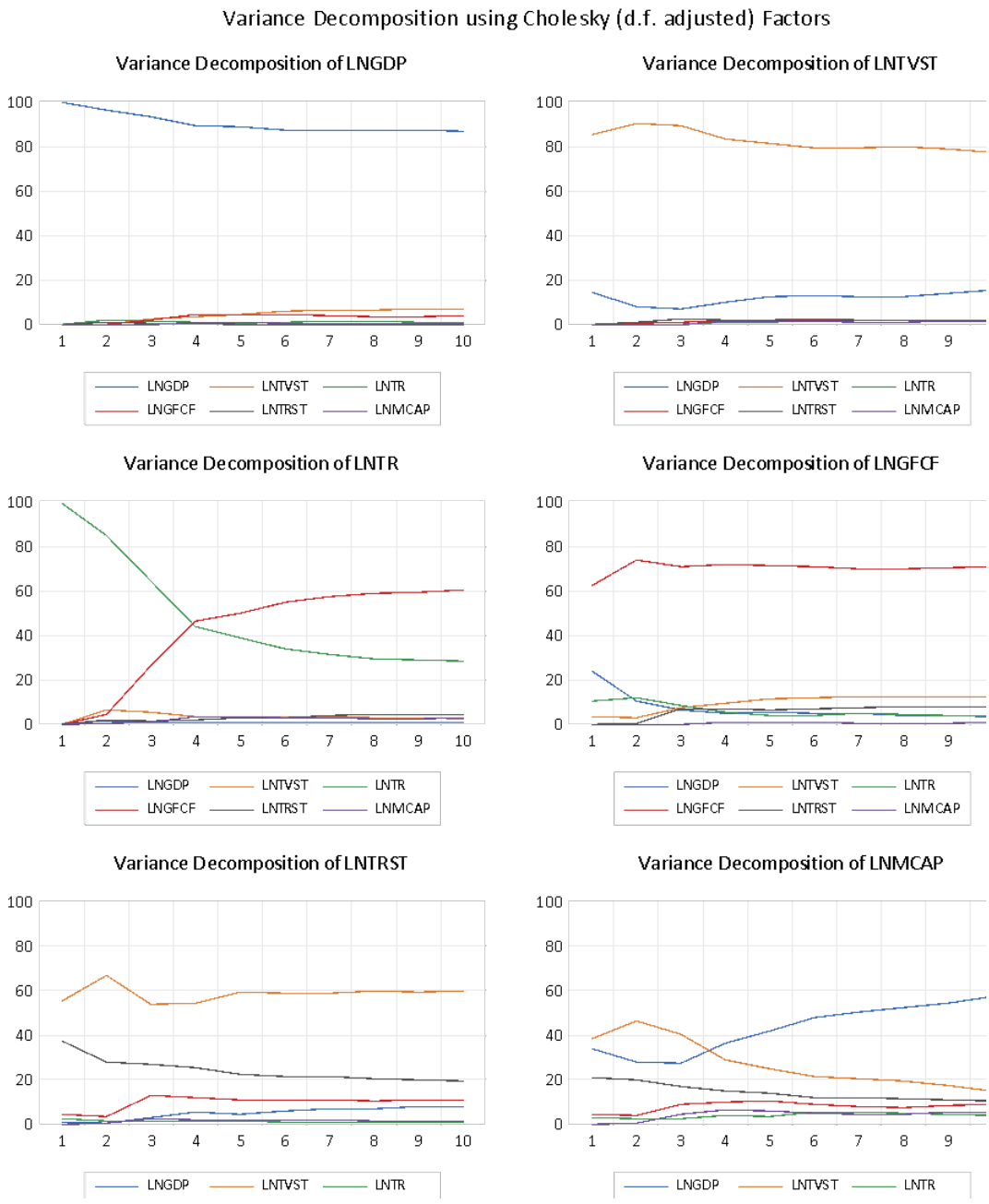


Figure 3: Variance Decomposition Results

### 5.2.5 Impulse Response Function (IRF)

Figure 4 shows the time path of the responses of each of the variables over various periods, to a shock in the system. These are the impulse response functions (IRF). The graphs are all self-explanatory.

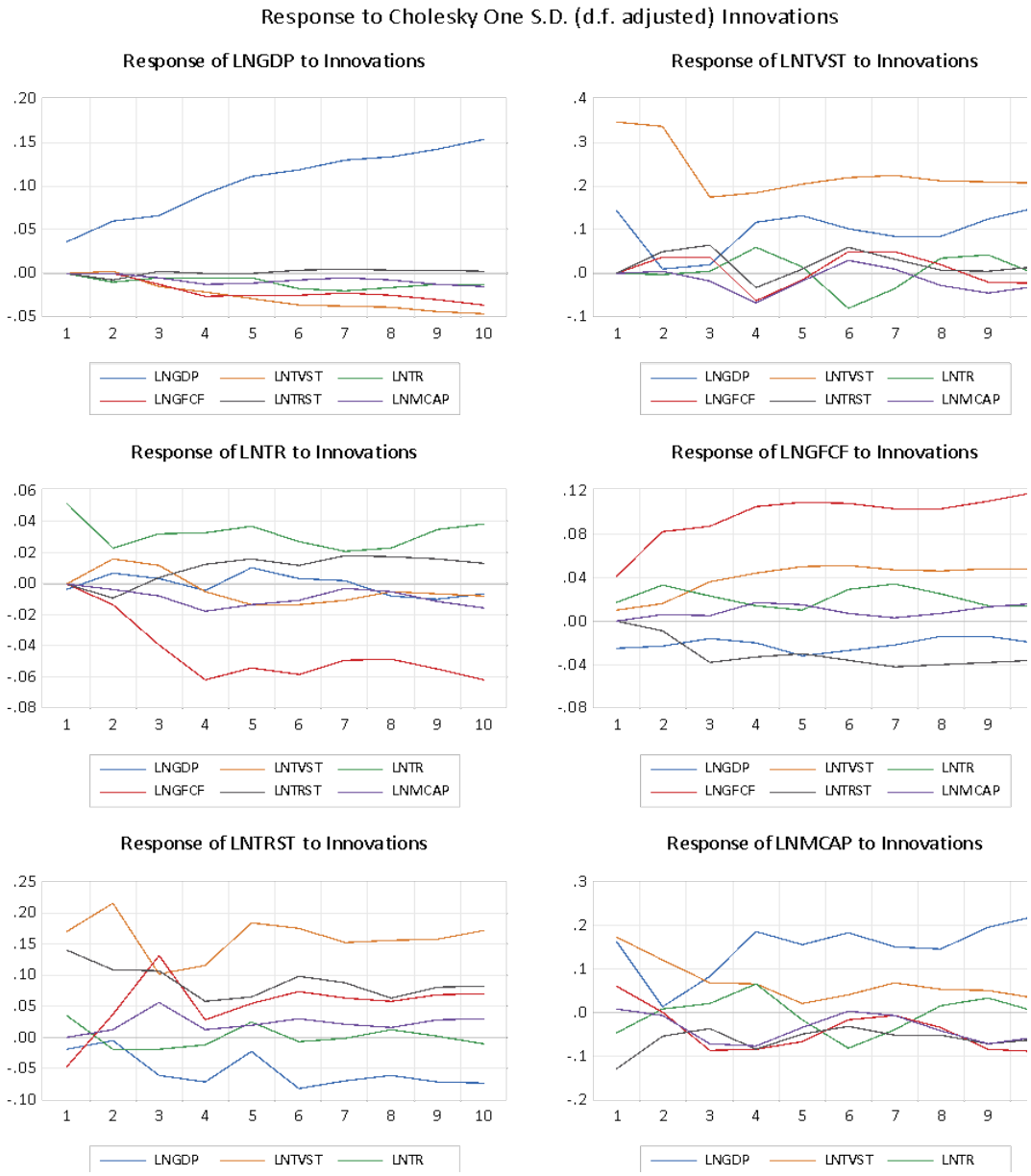


Figure 4: Impulse Response Functions

# Chapter 6

# CONCLUSION AND POLICY IMPLICATIONS

## 6.1 Conclusion

Economic growth begets financial development, increases income, alleviates poverty, and raises living standards in an economy. In the literature, the determinants of economic growth have been overly examined. This thesis has extended the discussion by examining the impacts of stocks traded (% of GDP), trade openness, investments, stocks traded (% of shares turnover), and market capitalization on economic growth. Up to five regressors were included in the model, in order to reduce the potential omitted-variable bias. The World Development Indicators (WDI) of the World Bank served as the primary reference point for all of the data. All the variables in the model were log-transformed, to reduce the possibility of heteroscedasticity and make normality more plausible.

It was then demonstrated that they are I (1) variables, which means that they have a unit root at their level forms and are stationary at their first differences. This assertion was supported by the evidence obtained from the unit root test.

After determining the order of integration and stationery of the variables, the next step was to apply Johansen's three stage procedure to examine the long run relationship between the variables and economic growth. This allowed for the testing of the research hypotheses and the examinations with the actual empirical findings.

In addition to adding to the literature on the determinant of economic growth and the impacts of key macroeconomic variables, the thesis provides important policy recommendations based on the results of analysis.

I analyze the order of integration of all variables and their stationarity by performing a stationarity test using unit root tests. This test looks at the variables' stationarity. It was discovered through the use of the Augmented Dickey-Fuller (ADF) and Philipps-Perron (PP) unit root tests that all of the variables were integrated of order one. It was demonstrated that they are I (1) variables due to the fact that, in general, they have a unit root at their level forms and are stationary at their first differences. This assertion was supported by evidence. The next step was to execute Johansen's three-stage procedure because all variables are I (1). This was the next phase.

The estimation of a typical unconstrained vector autoregressive (VAR) model is the initial step in Johansen's procedure. It has been determined that this particular VAR model is robust. It was determined that the optimal lag duration was three by using the Akaike, Schwarz, and Hannan-Quinn information criteria in conjunction with the final prediction error (FPE). The Johansen test for cointegration made use of this ideal lag length, but the estimation of the vector error correction model made use of a lag length of two (which was optimal lag length minus one). The second step in Johansen's technique was to perform the Johansen cointegration test. We examined not just the maximum Eigenvalue but also the Trace test statistic in order to reach a conclusion. According to the trace test statistic, four cointegrating equations were found. As per the maximum eigenvalue, the presence of two cointegrating vectors was revealed. Since at least one cointegrating equation was found, it was concluded that the variables are cointegrated, and they will converge to their long-run equilibrium values.

In the third step of Johansen's approach, the vector error correction model was estimated. This yielded the long-run coefficients, short-run coefficients, and error correction term coefficient (ECT). In the long-run, stocks traded (% of GDP), market capitalization, investment, trade openness, and stocks traded (% of turnover) were found to have statistically significant negative (contrary to a priori expectations), positive (as expected), positive (contrary to a priori expectations), positive (contrary to a priori expectations), and positive (contrary to a priori expectations) effects, respectively, on economic growth. Most of these results are logical: increased market capitalization means increased share prices, thereby increasing potential capital gains for existing shareholders of firms. This increases disposable incomes and raises living standards, thereby promoting economic growth. Also, increased investments will increase income and bring economic prosperity. Again, increased production will increase exports (trade openness), and this will generate more foreign income and promote economic growth.

In the short run, none of stocks traded (% of GDP), market capitalization, investment, trade openness, and stocks traded (% of turnover) was found to have a statistically significant impact on economic growth. However, the effects of shocks to the system were explored, by looking at the impulse response functions (IRF) of the variables, as well as their variance decompositions. With respect to the impulse response functions, over the next decade, shocks to economic growth itself will cause economic growth to increase on average, shocks to stocks traded (% of turnover) and market capitalization will cause economic growth to be relatively stable on average, while shocks to stocks traded (% of GDP) and investments will cause economic growth to decrease on average. With respect to the variance decompositions, the variation (variance) in economic

growth is almost exclusively dependent on shocks to economic growth itself, with the shocks to the other variables having a very minimal effect.

The Granger causality-in-mean tests under the VECM were carried out in order to determine the directions of the long-run and short-run correlations that exist between the variables. In the long run, it was found that Granger-caused economic growth was caused by a combination of stocks traded (% of GDP), market capitalization, investment, trade openness, and stocks traded (% of turnover). However, in the short run, this effect was not observed.

Because the VECM performed so well, and because it is suitable for determining long-run associations, all of the results, both long-term and short-term, were considered to be valid. This is because it was found that the coefficient of the ECT, which measures the speed of adjustment of economic growth towards long-run equilibrium, had a negative value, was statistically significant, and had an absolute value of less than one. The reason for this is that it was discovered that the coefficient of the ECT measures the speed of adjustment of economic growth towards long-run equilibrium. To be more specific, the short-run values of stocks traded (percentage of GDP), market capitalization, investment, trade openness, and stocks traded (percentage of turnover) all contribute to economic growth eventually converging to its long-run equilibrium level at an average annual adjustment speed of about 9 percent.

## 6.2 Policy Implications

According to the results of the empirical research, it was discovered that stocks traded (as a percentage of GDP), market capitalization, investment, trade openness, and stocks traded (as a percentage of turnover) each had statistically significant negative,

positive, positive, positive, and positive effects, respectively, on the expansion of the economy over the course of a longer period of time. The following suggestions for changes to public policy are offered in light of these findings:

The market capitalization of businesses, the number of investments made in the economy, and the economy's access to international trade should all be increased. To increase the market capitalization, firms can be encouraged, through incentives, to issue more shares to the public (and increase the number of shares outstanding) and / or to take share-price-increasing decisions such as increasing dividends. In order to ensure the effectiveness and efficiency of the trading system, it may also be necessary to update the monitoring system and current laws and regulations. For instance, it is necessary to develop more open accounting and transparency practices. Increasing investor confidence in the system is more crucial. More investors' engagement, particularly international investors, will once more increase market liquidity. By increasing market liquidity, the market will be better able to support investment and provide effective asset allocation, which could accelerate the economic growth of the nation. More measures should be put forth to increase the competitiveness of the capital market and give investors liquidity. A capital market's liquidity is particularly important since it has a big impact on how an investor makes financial decisions. This is so that an investor can preserve their money by choosing to participate in a capital market where shares can be quickly sold, and the act of selling has little impact on the stock's price. However, as it is also discovered that the debt market has a large positive impact on the economy, it should be taken into account when creating policy.

## 6.3 Suggestions for Future Research

It is advised that additional study be conducted so that the following constraints can be addressed:

When conducting unit root tests, the first step is to ensure that structural breaks are properly handled for. Unit root tests such as the Zivot-Andrews and Narayan-Popp could be of use, for instance. This is particularly significant since it may alter the order in which the integrations of the variables are performed, which would mean that a new technique should be adhered to.

Second, rather than conducting a time-series analysis, panel data techniques can be used to investigate the factors that influence economic growth. These techniques include the pooled mean group autoregressive distributed lag (PMG-ARDL) model and the cross-sectionally augmented autoregressive distributed lag (CS-ARDL) model, both of which were developed in 2015. These models allow for an understanding of the results that are typically seen in a collection of countries over a period of time.

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