BUDGET DEFICIT AND ECONOMIC GROWTH: A COMPARATIVE STUDY
BETWEEN BANGLADESH AND SRI LANKA

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DECLARATION

This is my original work and has never been submitted for a degree in any other university.

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This MPhil thesis has been submitted after correcting the issues raised by the examiner (Dr. Zahid Hasan) with my approval as university supervisor of the Master of Philosophy program. After examination of the MPhil Thesis I recommend the candidate can be admitted to the degree of Master of Philosophy without any further correction.

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ABSTRACT

Bangladesh and Sri Lanka are consistently facing budget deficit problems since independence. This study used secondary quantitative time series data of two different period datasets from 1982 to 2020 for Bangladesh and from 1990 to 2020 for Sri Lanka. All datasets are collected from the international monetary fund. This study explores the impact of budget deficits on the economic growth of Bangladesh and Sri Lanka, respectively. We select budget deficit as a percentage of the gross domestic product as the independent variable and economic growth rate as the dependent variables for both country analyses. Development and economic progress are difficult to define. Growth is more than just increased GDP or infrastructural development. Different schools of thinking explain story differently. In traditional political economy, growth rivals development. Neoclassical and Keynesians likewise emphasize growth for economic success. Marxists, radicals, and Neo-Marxists criticise capitalism progress. Later, Amartya Sen and others emphasised well-being, competence, and endowments. Economic growth is tied to fiscal policy. Macroeconomic analysis of growth is needed to examine the budget deficit and economic growth. The underpinning background theories of this study are Keynesian theory, Ricardian equivalence theory, Hirschman disequilibrium theory, Rostow's growth stage model, and Dependence theory of economics. The study selects two models for two countries based on unit root test output. The study used summary statistics, correlation matrix, unit root test, lag selection criteria, autocorrelation test, heteroscedasticity test, etc. The applied model for Bangladesh data was the vector error correction model (VECM), and that for Sri Lanka was autoregressive distributed lag (ARDL). Statistical tools validated most of the statistical findings. Bangladesh's budget deficit hurts economic growth, whereas Sri Lanka's does not. Two datasets had different outcomes. Both results support Keynesian theory. This analysis determined Sri Lanka's budget deficit is positive and Bangladesh's is not a harbinger.

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CHAPTER ONE: INTRODUCTION

A nation's economic growth or decline may be affected by the policies that its government takes. However, the significance of the shortfall in economic growth is still a matter of debate. One theory is that a widening deficiency will lead to higher tax rates, reduced output and discouraging private-sector investment. It is generally accepted that deficit spending may boost economic output by working in tandem with investments made by businesses. This study investigates the likelihood of such claims between Bangladesh and Sri Lanka. Since their independence, Bangladesh and Sri Lanka have struggled with fiscal deficits. The research employed secondary quantitative time series data from 1982 to 2020 for Bangladesh and 1990 to 2020 for Sri Lanka. In this analysis, we look at how the budget deficit in Bangladesh and Sri Lanka affected their economies over time.

Improvements in industrial productivity, economic structure, fiscal reform, budgeting, import quotas, courting FDI, and easing investment processes were all front and centre for Bangladesh's policymakers in the 1980s. From 1991 to 1993, the IMF urged the government of Bangladesh to improve the country's structural capabilities. Since gaining its independence, Bangladesh has struggled with several issues, including a budget deficit, negative trade balance, reliance on assistance and grants, inadequate tax collection, etc. Dependence on grants and foreign aid decreased dramatically beginning in 1990. From 2001–2003, Bangladesh took significant action to improve the economy. The Poverty Reduction and Growth Facility (PRGF) initiative was approved by the International Monetary Fund (IMF) to the tune of USD 490 million to help alleviate poverty (IMF, 1999). The World Bank Group approved a 536 million USD loan with zero interest to stimulate the economy (World Bank, 2022a). Thus, 5.8% GDP growth was realised in Bangladesh. It had risen beyond 5% for the first time. Since then, the country is experiencing positive economic growth.

Even in times of increased global uncertainty, Bangladesh has shown a consistent ability to thrive and prosper. Several factors have supported rapid economic expansion over the past two decades, including a solid demographic transition, strong ready-made garment (RMG) exports, persistent remittance inflows, and stable macroeconomic conditions. The recovery from the COVID-19 epidemic strengthened significantly during Fiscal Year (FY) 22, despite new hurdles given by the recent increase in prices of daily needs. Also motivating is Bangladesh's accomplishment in decreasing poverty and increasing its economy. Bangladesh was one of the most underdeveloped countries during its birth in 1971, but it has now attained lower-middle income. It is projected to be removed from Least Developed Countries (LDCs) list by 2026 (Bhattacharya & Borgatti, 2012). The percentage of people living below the international

poverty level of \$1.90 per day has decreased from 43.5% in 1991 to 14.3% in 2016 (Using the 2011 Purchasing Power Parity exchange rate) (Francisco et al., 2015). In addition, numerous indicators of human growth showed substantial improvement.

The economic situation in Bangladesh is like that of many other nations worldwide. Commodity price increases and increased imports in the second part of FY22 contributed to a ballooning BoP deficit and a sharp rise in inflation. Consequently, the country's FX reserves dwindled to US\$38.9 billion in August 2022 (World Bank, 2022b). As import reduction measures hamper economic activity, real GDP growth is forecast to decelerate in FY23. In the medium term, the balance of payments is anticipated to become positive again as import growth slows. To become an upper-middle-income country by 2031, Bangladesh must grow human capital, cultivate a skilled labour force, construct efficient infrastructure, and create a regulatory climate that fosters private investment. Priorities for development include growing exports beyond the ready-made garment (RMG) industry, enhancing governmental institutions, especially fiscal reforms to provide domestic fun, ds for action, and boosting the sustainability of urbanisation. Filling infrastructural deficiencies would boost economic growth. Bangladesh will be better able to withstand future shocks if its sensitivity to climate change and natural catastrophes is reduced. Making the switch to green growth would help ensure that development gains stay healthy for future generations.

Moving to Sri Lanka, growth and poverty are being hampered by the country's unsustainable debt and acute balance of payments crises. Recent reports indicate that Sri Lanka's real GDP will drop 9.2 per cent in 2022 and another 4.2 per cent in 2023 (*National Accounts Estimates of Sri Lanka*, 2022). Sri Lanka's political climate is unstable, and the country's fiscal, external, and financial sector imbalances have worsened, creating considerable economic instability. Progress in budgetary reduction, debt restructuring, and growth-enhancing structural reforms will determine the economic prognosis, which is fraught with uncertainties. Even if central banks tighten their grip on the economy, inflation is expected to remain stubbornly high for the foreseeable future. Medium-term restructuring initiatives are likely to lead to a declining budget deficit. Due to import reduction, the current account imbalance is predicted to narrow. In order to fill the shortfall in external finance, more money will be required in 2023 and later years. Above 25% poverty is expected to persist over the next several years.

Key concerns include a delayed recovery from the scarring effects of the crisis, a sluggish debt restructuring procedure, and little external finance help. A tighter monetary policy is necessary

with fiscal austerity to restrain inflationary pressures. A serious debt restructuring is required to bring the debt load back down to a manageable level. Because of its extensive ties to the public sector, the financial industry requires careful management. While the necessary macroeconomic adjustments may adversely affect growth and poverty alleviation in the short run, they will ultimately restore macroeconomic equilibrium and international financial markets and establish a foundation for sustained economic expansion. During the adjustment, it is still crucial to take measures to lessen the effects on the poor and the vulnerable. A rise in the actual value of earnings and an increase in industrial and service sector jobs are necessary to reduce poverty. A viable reform program with the backing of foreign partners and funding might boost confidence and bring in new financial infusions.

Even before the COVID-19 outbreak, Sri Lanka's economy was displaying indications of decline. The previous five years have seen a slowdown in both growth and the decrease in poverty (Asel et al., 2022). The external imbalances were caused by the government-imposed restrictions on trade and investment, low confidence in the economy, periods of easy money, and artificially low exchange rates. High fiscal deficits, huge gross financing requirements, and a fast rise in unsustainable debt result from long-term fiscal imbalances caused by poor revenue collections and tax cuts in 2019 (Asel et al., 2022).

Sri Lanka's credit ratings were downgraded in 2020, cutting off the country's access to global financial markets (George et al., 2022). Even though it could not access international financial markets, Sri Lanka could keep its current foreign debt and imports afloat by drawing on its government reserves and bank loans. Sri Lanka's official reserves decreased from $7.6 billion in 2019 to less than $400 million in June 2022 (excluding a US$1.5 billion currency exchange with China) (Asel et al., 2022). In addition, the banking sector's net foreign assets fell to -5.9 billion US dollars in June 2022 (Asel et al., 2022). Since the second quarter of 2022, when the acute FX liquidity restriction first became apparent, the economy has suffered from fuel, medication, cooking gas, and input shortages. Having exhausted its reserves, Sri Lanka declared in April 2022 that it would suspend payments on its foreign debt and hired legal and financial advisers to assist with debt restructuring. A new president was installed in July 2022, despite widespread popular opposition. However, while the economic crisis drags on, political tensions still stay high.

The annual GDP decline in the first half of 2022 was 4.8% (George et al., 2022). Due to input shortages and supply chain interruptions, all significant sectors saw a drop. Purchasing

manager indices and additional high-frequency indicators indicate that stress remains beyond the initial six months.

In August of 2022, food prices increased by an astronomical 93.7 per cent year over year, contributing significantly to overall inflation of 64 per cent. It results from growing commodity prices worldwide, monetising the fiscal imbalance, and a depreciating currency. The 2021 prohibition on chemical fertilisers and its accompanying effect on crop yields have influenced domestic food supply, agricultural earnings, and food security. Between January 2022 and July 2022, the Reserve Bank of Sri Lanka hiked interest rates by 950 basis points to combat inflation (Mehta, 2022).

Because of the slowing economy, poverty levels are likely to have risen in 2022. Low-income households have been hit particularly hard by factors such as food price increases, job losses, a shortage of fertiliser, and a decline in remittances. Social assistance may help, but it is not enough to compensate for the significant income decline. The goods trade deficit narrowed by 18.6 per cent year-over-year in the first half of 2022, thanks mainly to financial assistance from India, totalling over US$3.8 billion. This aid was essential in facilitating the expansion of exports, particularly textiles (Mehta, 2022). A combination of declining remittances and low tourist receipts is thought to have contributed to the widening of the current account deficit throughout this period. After the Sri Lankan Rupee (LKR) devalued by almost 78 per cent after being floated in March, the country's central bank reverted to a controlled float in May (George et al., 2022). Despite mandated repatriation and conversion requirements, low market trust has made it difficult for Sri Lanka to receive export revenues and remittances via legitimate channels.

Although expenditure rose owing to increased aid for social security users, public workers, and pensioners, the primary deficit was reduced in the first four months of 2022 because of many revenue efforts, such as a one-time tax on large firms. Despite the growing interest expense, the total deficit continued to be supported by the central bank. In May, via the Interim Budget, then again in August, the government hiked the Value Added Tax rate from 8% to 15% to generate more money (Mehta, 2022).

This study focuses on the comparative economic growth of Bangladesh and Sri Lanka and its relationship with the budget deficit. To understand the phenomenon of economic growth and budget deficit relation, we also need to give substantial importance to a few other things. The variables of economic growth and budget deficit are to be identified for both countries.

Empirical analysis of this variable will provide us with a relative position to analyse how the budget deficit of the nations is reacting to economic growth. Understanding the departure of growth from development is also a core of the study. In this paper, the theoretical basement is mostly leaned with the Neo-classical understanding of growth. As both Bangladesh and Sri Lanka had background socialist influence during their independence, it is essential to understand the departure of the Neo-classical school's thought from radicals. Again, as both countries have significant achievements in terms of Human Development, and the governments are also emphasising well-being economics, and the fiscal policy of the government is the perimeter of the paper to understand growth, it is essential to comprehend growth from the perspective of the macroeconomic understanding rather than the understanding of development economics. The basement of the paper is covered mainly by Keynesian macroeconomic understanding, growth stage theory, equivalence theory, dependency theory and unbalanced growth theory.

The study is to apply systematic statistical approaches and appropriate models to analyse the relationship between various parameters, considering the availability and validity of the data acquired. The study's methodology, research model, and design were taken directly from the previous investigator. Our robust estimation suggests a mix of upward and downward trends in the growth of these two countries. Irrespective of the growth trend, the budget deficit is increasing over time and impacting the countries' GDP.

The study is partite into five sections. We will describe the study's theoretical and methodological frameworks in the following chapters, after which we will briefly overview the relevant literature. Before wrapping up, we will cover the last of the empirical analysis.

1.2 Objectives of Study

The followings are the objectives of the study

1. To know the trends of Bangladesh and Sri Lanka variables, respectively.
2. To find the relationship between budget deficit and economic growth for the economy of Bangladesh.
3. To find the relationship between budget deficit and economic growth for the economy of Sri Lanka.
4. To compare Bangladesh and Sri Lanka empirical results based on various indices.

CHAPTER TWO: LITERATURE REVIEW

Economists need to be sceptical about defining development and economic growth. Growth is not merely the increase of the gross domestic product or the development of infrastructures. Different school of thought has explained the growth from different perspectives. In some classical political economies, growth has been shown as a compeer to development. Neo-classical and Keynesians also emphasised growth to ensure the economic progress of a country. While radicals, Marxists, and Neo-Marxists have criticised capitalist growth. Later, Amartya Sen and other social-economic scholars emphasised well-being, capability, and endowments. Our study of economic growth is related to the government's fiscal policy. Therefore, the macroeconomic analysis of growth is necessary for our discussion on the relationship between the budget deficit and economic growth. A core review of the Keynesian theory of macroeconomics and Ricardian understanding of equivalence theory is essential for the study. Other than radical economic thoughts like dependency theory, which mainly criticises capitalist development, also relevant to our discussion. Rostow's growth stage theory and unbalanced growth theories are also the core basement of our study. In addition to this fundamental literature, we will also conduct checks with a sharp eye to discover articles or literature regarding the rate of economic growth and the budget deficit as a percentage of gross domestic product. These two metrics will be of particular interest to us. This research analyses the underlying background ideas that may explain and linkup the budget deficit with economic development. Specifically, the study focuses on the analysis of the results of the empirical research as well as the link between the budget deficit and gross domestic product.

Only a few theories have been developed to explain the effect of a fiscal surplus or deficit on a country's gross domestic product (GDP). The underlying background theories can explain the influence of a budgetary shortfall or deficit on a country's gross domestic product. They may be used to construct a methodical framework to carry out the research step-by-step.

In 1936, John Maynard Keynes argued that by lowering the interest rate at which the central bank lends money to commercial banks and increasing government spending on infrastructure, the Great Depression could be alleviated, and investment in the economy encouraged. He argued that stimulating the economy (encouraging investment) through various means was the solution to eliminate the Great Depression. Government funding may reverse the impacts of the imbalance described above in the nation's infrastructure. These investments generate money for the economy by generating new business opportunities, employment, and demand. Keynesians argue that rising public expenditure will result in rising aggregate demand. It will, in turn, increase the profitability of private investments, which will lead to an increased level

of investment so businesses can capitalise on the improved aggregate demand in the economy because the amount of money that the government spends is greater than the amount that it brings in through taxes and other forms of revenue, a budget deficit results. The government finances these kinds of expenditures by taking out loans from the private sector through issuing government bonds. In the realm of economics, David Ricardo, a notable British political economist, is credited with the introduction of a theory that came to be known as the Ricardian Equivalence hypothesis after being examined by Robert Barrow, a professor at Harvard. According to this idea, a budget deficit will either have the same effect on economic growth as it would have had in the past or would have no effect at all. It is standard practice for political governments to work to foster increased economic expansion in the nations they oversee. To accomplish this goal, excessive government spending that increases debt may not be successful. It is because taxpayers are aware that more money spent will be recovered in the form of further taxes in the future. According to this hypothesis, deficit spending is comparable to spending out of current taxes since taxpayers will have to pay the predicted future taxes; this will tend to counteract the negative impact that more lavish government spending has on the macroeconomy.

W.W. Rostow, a prominent American economist and bureaucrat, first presented the economic development hypothesis phases in 1960. This theory is now accepted as canon in the discipline of economics. During the period of state capitalism and liberal democracy, he proposed five phases that all nations needed to pass through to become developed. These stages were based on the idea that the development or modernisation of the country was a prerequisite for either. These steps are as follows: 1) the conventional social structure, 2) the necessary prerequisite for lift-off, 3) the beginning of the flight, 4) the push toward reaching maturity, and 5) the peak of high-volume mass consumption. The traditional society is an agricultural-based economy, and the precondition for take-off is to begin to develop manufacturing; take-off means a period of in-depth growth; the drive to maturity means a long period to sustain the growth; and the final stage is named the age of high mass consumption, which is when the economy flourished with a capitalistic character. The most crucial stage is called the take-off stage, and it gets its name from the fact that most nations' goal is to go from a state of underdevelopment to that of a developed country. Increasing the amount invested is essential to reaching more significant growth per capita.

Late in 1950, Argentine politician and economist Raul Prebisch presented a theory in the field of economics that came to be known as the Dependency Theory. According to this view,

underdevelopment is caused by the marginal location of afflicted nations within the global economy. In the global market, developing nations typically offer low-cost labour and raw materials purchased by developed economies with the technology to transform them into finished goods. It results in developing nations having to pay a premium to acquire the finished goods, which drains their resources and prevents them from investing in production capacity expansion. The result is a self-perpetuating system that divides the world's economy between a privileged few and everyone else. It is a modernised form of socialism advocated by Marx, also known Neo-Marxian theory of development.

Later Hirschman (1969) introduced the theory of unbalanced growth. In a competitive economy, profits and losses are symptoms of disequilibrium, but he argued that development is a cycle of disequilibria that must be kept alive. In other words, development is a series of disequilibria that, rather than being eliminated, must be maintained. To stimulate economic expansion most effectively, it is necessary to consciously cause monetary disequilibrium through the plan. Three schools of economists (Neoclassical, Keynesian and Ricardian) generalised the impacts of budget shortage on the gross domestic product (Bernheim, 1989). According to the Neoclassicals, if economic resources are entirely engaged, then savings will decrease the increased interest rate. Thus, continuous shortage (deficit) pooled private capital. As a result, the economic growth rate decreases. Keynesian thought assumes unemployment increases government expenditure that needs borrowing and would expand output. Ricardian thought assumes budget shortage not impacted gross domestic production. So, the Neo-classical school of thought is the most relevant regarding the relationship between budget shortage and gross domestic production. Hirschman (1969) opined that a deficit results from imbalanced growth that focuses more on innovation by offering incentives for pushing economic activity and progress.

In a study, Cebula (1988) discovered a statistically significant substantial correlation between the budget gap and interest rate. Most macroeconomic variables are unaffected by budget scarcity, which is irrelevant or neutral in determining the relationship between budget shortage and gross domestic product (Barro, 1989). By sampling cross-sectional data with the particular model, Martin & Fardmanesh (1990) researched the relationships among some revenue decision variables on the gross domestic product of seventy-six (76) countries classified as developed and developing from 1972 to 1981. The study concludes that a tight budget harms growth. Government spending boosts the economy, while a budget deficit raises taxes.

Additionally, they discovered that fiscal policy factors affect economic growth in developing nations, with budget deficits having a detrimental effect on growth rates in low-, middle-, and high-income nations. According to Fischer (1993), the budget deficit or surplus is one of the most significant fiscal policy variables impacting economic growth. Fiscal policy variables are an instrument that the government may control. The fiscal policy variable that has the most significant relevance and utility in influencing economic growth is the budget deficit; however, it is not the only one. Using cross-sectional panel data analytic techniques, we looked at a study on spending on manufacturing, transportation, and communication and concluded a correlation between fiscal shortage/surplus and GDP. According to the study, plus budget benefits economic growth, whereas a budget deficit has a negative impact. In Easterly & Rebelo (1993) research on ten developing countries, Easterly & Schmidt-Hebbel (1993) discovered some intriguing self-fortifying items. They also discovered that budget imbalances caused changes in interest rates. Al-Khedair (1996) did a study and concluded that there is no long-term relationship between budget shortage and interest rate.

Using the ordinary least square (OLS) approach, Hakkio (1996) conducted a study on Sweden and Finland from 1979 to 1995 and discovered that the budget deficit harmed currency exchange rates (EXR). In his research on India, Mohanty (2012) discovered an inverse relationship between fiscal constraint and GDP and concluded that severe fiscal constraint decreases GDP. Ghali & Al-Shamsi (1997) conducted an empirical study using quarterly data series and concluded a correlation between fiscal policy (investment) and economic growth. Using the ordinary least square (OLS) approach, Shojai (1999) researched emerging nations and discovered that the budget deficit hurts efficiency, the currency exchange rate (EXR), and interest rates reduce an economy's capacity to compete on the global market. Using a direct correlation between a budget gap and investment, Bahmani-Oskooee (1999) investigates the link between a deficit budget and investment over a lengthy 46-year period. He established the connection using the cointegration approach, which supports the Keynesian theory. Kneller et al. (1999) conducted a study to find a link between the budget deficit and the GDP and determine whether there is a significant relationship between them. Ahmed & Miller (2000) conducted a ten-year study on 39 least developed nations to determine the relationship between public spending, GDP, and fiscal constraint and discovered that these variables are positively connected with GDP. Prunera (2000) researched to determine if there was a relationship between fiscal shortage and gross domestic product and found a very weak and insignificant correlation. However, that deficit spending on infrastructure, human development, education,

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and other areas benefits a country's long-term economic health. This debt financing investment must be carefully chosen while guaranteeing repayment since failure might be risky or detrimental to the economy's gross domestic product. Many nations worldwide raise taxes to pay the budget deficit while cutting living standards, which may reduce future economic growth and borrowing capacity.

Vamvoukas (2000) used the error correction model to analyse Greek data from 1970 to 1994 in search of a connection between the country's budget deficit and economic development. He concludes that the Keynesian theory of economics is supported by the evidence, namely the high correlation between budget deficits and economic growth over the long and short run. Research by Gemmell (2001) of high-, middle-, and low-income nations revealed that budget deficits correlated negatively with GDP. The Gemmel (2001) study was corroborated by the work of Bräuninger (2005), who agreed with Gemmel's conclusion but added that if the budget deficit ratio were to rise over a certain threshold, economic growth would fall constantly. Nonetheless, postulates and circumstances would help him understand the crucial threshold. R. Cebula (2003) used the error correction model (ECM) from 1973 to 1996 to investigate the connection between budget deficits and economic development worldwide, finding a positive and statistically significant association between the two. Spending should be in the productive sector or pay return in the future, such as human development, education, health, etc., according to a study conducted by Bose et al. (2007) on thirty DC to establish a link between budget deficit and gross domestic product.

To examine the findings of earlier studies, Saleh & Harvie (2005) undertook a study to determine the nature of the link and the reasons for the variation in production (a budget deficit) across different economic factors. Mosaic outcomes are those in which several factors have varying degrees of influence on the budget deficit, as he discovered. As expected, varied findings are attributed to regional and contextual differences. That is why the study could not pinpoint exactly how a budget shortfall affects GDP. This research employs the differential equation for several variables concentrating on the IS-LM model. (Schclarek, 2004) studied developing and industrialised countries to find a relationship between debt financing and economic growth and vindicate an inverse relationship between economic growth and external debt for developing countries. However, no relation exists between debt and economic growth in industrialised countries. Vít (2004) directed research on the Czech Republic from 1995-2002 by utilising a quarter dataset to assess the effect of the fiscal shortfall on the economy of the Czech Republic. His conclusion was murky at best. He concluded that the budget deficit

hampered the economy, but he did not clarify whether it happened to what amount and how? The effects of several macroeconomic indicators on India's GDP were studied by Vuyyuri & Seshaiah (2004). They observed that there is no association between budget deficit and economic growth, particularly in the case of India; there is no significant relationship among the variables such as money supply, consumer price index, currency exchange rate, gross domestic product, and economic growth. The researchers also found that the budget deficit and the exchange rate were cause-and-effect relationships. They contended that the budget deficit influenced the gross domestic product, while the budget deficit did not impact the gross domestic product. They employed the cointegration approach and vector error correction tool from 1970-2002.

Adam & Bevan (2005) looked at 45 developing nations throughout the globe to see whether there was a connection between a lack of government revenue and GDP. Several results were discovered. The debt finance source is crucial to the discovery process. Since deficit funding may come from various places, with varying effects, the budget deficit's sway has become more nuanced. There is a strong direct relationship between fiscal shortfall and GDP if the budget deficit is financed by raising taxes and collecting grants. There is a strong inverse relationship between fiscal shortfalls and GDP if they are financed by domestic debt. A considerable positive link emerges between fiscal shortfall and GDP if the deficits are covered by external loans with interest rates lower than or equal to the market rate.

In conclusion, the researchers distinguished between two kinds of partnerships. One school of thought emphasises the size of the deficit, while another stresses the dependence of the deficit on its financing mechanism (Perotti, 2005). An investigation of the connection between budget deficit and economic growth conducted by Perotti (2005) across five OECD nations revealed a moderate effect of the deficit on GDP expansion. Chowdhury (2005) used a short-term approach to discovering connections between variables to investigate whether there was a correlation between fiscal shortage and GDP in five ASEAN nations. There was no correlation between the variables studied, according to the researchers. Spending deficit funds on public utility sector investments and infrastructure development might boost productivity. GDP rises, and the economy expands consequently. The situation would be reversed if a budget deficit stifled economic growth.

One cannot draw any firm conclusions from this research. Based on their research of Pakistan's economy, Chaudhry et al. (2005) concluded that monetary and fiscal policy factors are crucial

to maintaining economic stability. They investigated the connection using standard regression techniques and concluded that the fiscal and monetary policy factors impacted deficit spending. To determine whether a correlation exists between a country's budget deficit and its currency's exchange rate, Gülcan & Bilman (2005) oversaw research on Turkey spanning around fifty years. They investigated the link using cointegration, causality, and unit root analysis. This research found that budgetary shortfall considerably impacts the actual exchange rate. According to the report, the national central bank Inflation was positively impacted by the fiscal shortfall in 94 countries studied by Sill (2005), who followed the approach by Saleh & Harvie (2005) to link the two variables. When considering the research approach, theoretical framework, instrument, and data from prior studies, the effects of the budget deficit on economic development were analysed by Adam & Bevan (2005). They determined that a reduction in the budget deficit of 1.5% of GDP would boost economic growth. These results directly contradict Fischer's predictions (Fischer, 1993). Using the Levine-Renelt economic development model, he also discovered that budget deficits harmed the increase of per capita income. Budget deficits positively influence economic growth both immediately and in the long run, according to studies conducted by Gupta et al. (2005) in support of the Keynesian hypothesis.

They also attempted to quantify the effect of productive and wasteful government spending on economic expansion. More government spending results in a larger GDP, they say. Fiscal decentralisation and GDP were the focus of Vázquez (2004) research into the economies of India and China. Fiscal decentralisation and resource mobilisation have helped boost economic development in both nations. However, they will not reap the full benefits without proper fiscal system reform. Two massive Southeast Asian neighbours were shown to have a direct causal relationship between fiscal decentralisation and GDP. Huynh (2007) oversaw studies of Vietnam, an Asian nation in transition. He examines panel data that spans nearly twenty years to determine the connection between budget shortfall and GDP. When looking at Vietnam specifically, the analysis indicated that a budget deficit harmed GDP growth. Bose et al. (2007) steered studies to look at the link between government deficits and GDP. A positive correlation between government austerity and GDP was found. Over several years, from 1970 to 1990, they mined data from a large dataset. However, other academics have shown a negative correlation between budget shortfalls and GDP growth for the world's emerging nations. They advocated allocating deficit spending to areas where it might have the most impact, such as healthcare, education, and infrastructure. The effect will be accelerated development. To better

understand the impact of budget constraints on GDP in developing countries, the International Monetary Fund (IMF) commissioned a study. A negative correlation between budgetary constraints and GDP was found.

Majumder (2007) researched Bangladesh to investigate whether there was a correlation between a lack of funding and GDP. This investigation establishes a connection between its nature or patterns of causality using the rank matrix, VAR, or VECM approach and Granger causality. It was clear to him that the government's financial woes directly impacted GDP. Due to financial constraints, the analysis found that private investment must be increased rather than reduced to help Bangladesh. The link between budgetary shortfalls and interest rates was investigated by Aisen & Hauner (2008), who looked at data from many nations between 1985 and 1994. Interest rates were shown to be negatively correlated with budgetary deficits. Interest rates and budget shortfall were shown to correlate positively after 1995. The results are contradictory and inconclusive. The outcomes also differed considerably across nations. Several researchers looked at EU member states to see whether there was a correlation between government spending and GDP. Brender & Drazen (2008) looked at established and emerging nations to see whether there was a connection between budget deficits and economic development. When he looked at the cross-sectional analytic method, he discovered that it produced different findings in developing nations compared to more developed ones. Gross domestic product in emerging nations rises when governments are forced to cut spending to stimulate growth. However, industrialised nations, which spend more on non-productive (in-kind) activities, discovered the inverse.

Fatima et al. (2012) analysed a study to find a connection between a government deficit and GDP. According to the findings, there is no connection between the two. In addition, he links budget shortfalls favourably to GDP so long as the money used to fill them is put to good use. Adak (2010) looked at studies done in Turkey to evaluate the link between the budget gap and GDP and found that the relationship was, in fact, the other way around. He also believed there was no link between budget deficits and economic expansion in the past or the future. K did the legwork to link a government shortfall to GDP. Results were mixed for the research, which looked at a subset of West African nations that share a currency union. He used Granger causality and discovered no connection between the three nations. The four nations all share a terrible trait, he concluded. He proposed that a budget surplus is required for long-term growth. In doing so, the monetary union will finally catch up to its intended state. To determine the short- and long-term consequences of revenue breach on the deficit, debt load, and growth in

the Pakistani economy, Siddiqi & Ilyas (2011) analysed the link between the revenue gap and the budget deficit and growth. Debt load was unaffected by the revenue deficit, but they did find that increasing the country's ability to bring in money is crucial to managing the economy.

Mohanty (2012) oversaw research on the effect on investment and GDP. He concluded that there is no consensus among economists, either on methodological grounds or based on empirical data, regarding whether funding government spending by incurring a fiscal deficit is good, bad, or neutral regarding its actual impacts. To determine the relationship between budget shortfall and GDP, Fatima et al. (2011) examined data from Pakistan. Ultimately, they determined that the factors under investigation had the opposite relationship. The reasons for budget shortfalls were given more incredible thought. They discovered that political discontent is a significant contributor to fiscal deficits alongside factors such as narrow tax brackets, an inefficient tax code, a high-interest rate on debt, volatile prices, and a lack of price stability. Using several statistical programmes, Fatima et al. (2011) oversaw Pakistan-related studies conducted between 1980 and 2009. The budget deficit, they reasoned, reduced economic growth and altered the current account balance. The budget deficit and GDP growth were the subjects of an analysis by Krugman (2012). He pays special attention to the causes of budget shortfalls and the factors that play into them. He discovered that a country's GDP growth is unaffected by its budget deficit. Deficit financing did not impact aggregate demand or GDP growth during the recession. He further claimed that the investigated variable lacked any unidirectional causation. Even though some research has identified a negative relationship between them, this is likely due to the long-term impact of higher interest rates on economic growth.

For half a century, Taylor et al. (2012) analysed the effect of the fiscal shortfall on GDP growth and interest rate (1961 to 2011). The research employs a multi-stage VAR model supplemented by IRF and other statistical and economic methods. They discovered a strong positive relationship between budget shortfall and GDP. The authors also infer that reducing tax rates and increasing spending would increase GDP. Mohanty (2012) oversaw new research on the relationship between fiscal constraint and India's GDP from 1970 to 2012. He discovered a negative association between the budget deficit and economic growth in the long run but a positive relationship in the short term. He blamed the restructuring of the banking system for this unexpected outcome. The analysis classified the deficit both after the reforms and before them. Abd Rahman (2012) guided researchers by having them consider several study results, such as different approaches to research, connected or backup theory, the current

macroeconomic condition, and three different schools of thinking. According to his research, GDP is affected differently depending on the reason for the imbalance.

Fatima et al.(2012b) show that a fiscal deficit adversely affects GDP growth. They oversaw an analysis of the Pakistani economy from 1978 to 2009. The research makes use of the Least Significant Squares method. They also realised that Pakistan could not afford to increase spending on productive endeavours because of the budget imbalance. In other words, the economy was not helped by the drop in income. From 1990 through 2009, Antonino & Alem (2012) studied three wild tigers from across the globe. We use macroeconomic data from India, China, and South Africa to test for a correlation between fiscal shortfall and GDP and find a positive one. Ezeabasili et al. (2012) used cointegration and structural analysis to a dataset spanning 1970–2006 and discovered that fiscal deficit harms economic development (a 1% rise in fiscal deficit might cause a decline in economic growth by 0.023%). According to a study led by Biza et al. (2015), there is a negative association between budget deficit and economic development since it is crowding outs in private sector investment in the growing tiger of Africa dubbed South Africa. According to research by Taylor et al. (2012), the budget deficit influences all other macroeconomic variables, whereas the macroeconomic indicators also affect the budget deficit or balance. The impact of budgetary shortfall on GDP was studied by Bittante (2013). He demonstrated that investigations were consistent with either Keynesian or Neo-classical theories. Given that a budget deficit cannot boost aggregate demand, he concluded that it did not affect economic expansion.

Using the Granger causality test, Odhiambo et al. (2013) investigated the link between fiscal shortfall and GDP in Kenya during 1970–2007 and found that fiscal shortage directly affects GDP growth. They advocated for changes to the financial system that would encourage private investment while preventing a reduction in public spending. According to Velnampy (2008), the GDP in Sri Lanka was unaffected by the country's budget shortfall. They suggested that Sri Lanka's government put their money into something that would help the economy expand fast. Research by Çınar et al. (2014) on the ten countries of the Eurozone identified a causal relationship between fiscal scarcity and GDP growth. In order to study recession quarter statistics, the study chooses five nations with the most robust economies and five with the worst. Oversaw studies on the US economy and GDP growth regarding the budget imbalance. A statistical analytic technique investigates the relationship between the budget deficit, unemployment, inflation, and interest. Economic expansion was shown to be negatively impacted by both budget deficits and unemployment. Inflation, unemployment, economic

expansion, and interest rate were also shown to be interconnected. Rath & Sar (2016) oversaw a study of the Nigerian economy from 1981 to 2009 to determine whether certain macroeconomic factors were related to GDP. The researchers determined that the GDP growth rate was affected by the interest rate, budget deficit, and currency exchange rate by using Ordinary Least Square. Bhoir & Dayre (2015) looked at the Indian economy from 1991 to 2014 and found no evidence of a correlation between a lack of government funding and GDP. They also said that the Indian government should prioritise human development indicators like improved health, education, and infrastructure to boost the efficiency of people and physical capital and hasten the country's economic expansion.

Capital formation in the Nigerian economy is studied by Edame & Okoi (2015), who looked at the economy from 1985 to 2013 and split it into two regimes (one before and one after the Army dictatorship) to conclude that there is a direct correlation between fiscal shortage and GDP under the Army regime. Capital creation was shown to impact economic development for both periods, and the authors concluded that there was no correlation between fiscal shortfall and GDP before or after the regime. Using Augmented Dickey-Fuller and Chow's test, the analysis separates the years before and after 1999. Nayab (2015) looked at how to budget shortfall affected GDP growth in Pakistan over the long term, from 1976 to 2007. Using cointegration and the VECM method implemented in SAS software, the authors of this research discovered a connection between fiscal shortage and GDP. From 2000 to 2012, Haider et al. (2016) analysed the Bangladeshi economy. Finding an inverse relationship between fiscal deficit and economic growth of Bangladesh and also finding interrelationships among fiscal deficit, inflation, and accurate currency exchange rate, this study uses static test, Vector Auto-Regression (VAR), Vector error correction model (VECM), and causality test to investigate the link between budget deficit and economic growth in Bangladesh.

Multiple econometric methods and approaches were used to analyse previous research on Bangladesh's economy, which was analysed by Rana & Wahid (2017). The research concluded that the budget imbalance had a detrimental effect on Bangladesh's GDP. Good governance, political stability, and a more stable tax system were all mentioned as ways to encourage investment. The economy's output will rise as a consequence. Specifically, Hussain & Haque (2016) investigated the connections between FDI, exports, and GDP growth in Bangladesh. Findings from this VECM-based analysis show that FDI and exports have a beneficial effect on economic growth. Likewise, less money will leave Bangladesh as a result of this. While studying the impact of fiscal deficit and GDP growth rate from 1980 to 2014 on numerous

countries in the South Asian Association for Regional Cooperation (SAARC), Navaratnam & Mayandy (2016) discovered conflicting findings. He discovered a negative correlation between Nepal's budget shortfall and the country's GDP. There was a positive correlation between budget deficits and GDP growth in Sri Lanka, India, Pakistan, and Bangladesh.

Hussain and Haque also completed follow-up research on Bangladesh Hussain & Haque (2017). This research aimed to investigate the link between monetary policy and economic expansion. Monetary policy is determined by the increase in the money supply, while the gross domestic product expansion gauges economic expansion. There was a favourable correlation between ECM and causality methods. The report suggested that the government establish monetary policy by managing interest rates and inflation to slow the economy and sustain its expansion. The modern literature raises the important topic of whether a country's budget deficit reflects its GDP. It has been a heated debate among scholars and economics students for quite some time. What is intriguing, however, is that the results are ambiguous.

The deficit in government spending is the single most influential factor in the economy's health. Various theories are discussed in class as students try to establish a connection between the budget deficit and economic growth. Among them include the Keynesian school of thinking, the Ricardian Equivalence theory, Hirschman's disequilibrium theory, Rostow's growth stage model, and the dependency theory. According to classical economic theory, government expenditure that boosts aggregate demand via the "crowding in" effect is good for the economy and growth. The Keynesian perspective asserts that it stands in opposition to classical theory. When aggregate demand is weak as a safety measure, increasing government expenditure helps the economy recover. Most nations found excellent production by adopting this approach during the previous global recession, which lasted from 2007 to 2009. According to the Ricardian Equivalence Hypothesis, a rise in the deficit would lead to an increase in the tax base with a present value equal to the deficit, meaning that the deficit would have no stimulative effect on the economy. Rostow, a notable economist of the twentieth century, is credited with developing the growth stage economic model, which is often considered the best framework for understanding economic development. Studying the United States and Western Europe, he concluded that all countries go through five distinct phases of development on their way from the first (the traditional society phase) to the fifth (the age of high mass consumption), during which time government investment is required to build the infrastructure and social capital that will allow the private sector to invest and develop.

Hirschman introduced a theory titled the Disequilibrium growth model, in which he argued that growth is a chain of disequilibrium, a symptom of gains and losses in a competitive economy that must be sustained rather than eliminated; if the government invests in crucial sectors of the economy and builds the necessary infrastructure, the private sector will step in and invest in other sectors that become profitable after the initial government investment. Limited investment in critical industries is an excellent method to stop the vicious cycle of poverty, especially in developing nations where savings and investments are often smaller than in affluent ones.

CHAPTER THREE: RESEARCH METHODOLOGY

This chapter outlines the process step by step and describes data, population, sample, and model for completing the study successfully with a practical viewpoint.

3.1 Research Design

The research was designed by considering the availability and reliability of collected data to explore the relationship between discussed variables and systematically applied statistical tools with appropriate models. The study followed the prior researcher's research design, model, and methodology.

3.2 Data Collection

This research collected a secondary dataset over a long time from a prominent and reliable source named IMF. This paper covers time series data for an extended period from 1982 to 2020 for Bangladesh and a prolonged period from 1990 to 2020 for Sri Lanka. The study collects data from IMF but that reliable source is unable to provide same time frame dataset, that's why the research choose two different periods data.

3.3 Data Analysis

Data of (the GDP) growth rate is termed as the economic growth rate (EGR), Government revenue (GR), and government expenditure (GE) consequences budget deficit (BD) then calculate fiscal shortage ratio concerning the gross domestic product (BDP) is prepared for both countries. At first, the study observed the trends of the studied variables for both countries. Also observed are the economic growth trends and fiscal shortage ratio to gross domestic product for Bangladesh and Sri Lanka, respectively and then for all above. The study checked the dataset's summary statistics and correlation matrix for both time series datasets. Test of the stationary tendency of a time series dataset before exploring further relation between them is mandatory. Generally, most studies use a unit root test of data series is stationary or not. This paper explores the lag order by doing lag order selection criteria; after that, the study did a rank test before conducting a vector error correction model with causality assuming the following model:

$$y_t = \alpha + \beta y_{t-1} + \gamma x_t + \varepsilon_t \dots\dots\dots\dots\dots\dots\dots\dots\dots(1)$$

Here, y_t, represents dependent variable $= \text{EGR}_t$ and x_t, represents independent variable $= \text{BDP}_t$ and α, β, γ are constant, and ε is the error term. ADF test concludes with the non-stationary of the data series, but we need static data, which is done by differencing. Secondly, finding a

cointegration rank is essential. Johansen and Juselius's technique is more appropriate for having directional causality. The study found cointegration and then ran VECM and ARDL models for estimating the associations by considering the following equations -

$$\Delta EGR_t = \alpha_{1t} + \beta_{1t} \sum_{t=1}^{n-1} EGR_{t-1} + \gamma_{1t} \sum_{t=1}^{n-1} BDP_t - \theta_{1t} ECM_{t-1} + \varepsilon_{1t} \dots\dots\dots\dots(2)$$

$$\Delta BDP_t = \alpha_{2t} + \beta_{2t} \sum_{t=1}^{n-1} BDP_{t-1} + \gamma_{2t} \sum_{t=1}^{n-1} EGR_t - \theta_{2t} ECM_{t-1} + \varepsilon_{2t} \dots\dots\dots\dots(3)$$

Δ Denotes first-order differentiation symbol, θ_{1t} and θ_{2t} are the coefficients of error correction terms and ε_{1t} and ε_{2t} represents random terms of errors. Many previous researchers conducted studies on almost the same topic but methodology, selection of variables, time frame, etc., are different. This study is unique in selecting variables that cover a large time, comparing with another country, and testing twice most of the tests for more surety.

CHAPTER FOUR: EMPIRICAL ANALYSIS

4.1 Empirical Analysis of Bangladesh

4.1.1 Trend Analysis

Bangladesh's gross domestic product (GDP) is consistently rising over the period. The GDP of Bangladesh in 2020 was BDT 11477.97 billion, which was more than seven times that of BDT 1602.09 billion in 1982. Government revenue in 2020 was BDT 2651.8 billion than BDT 24.4 billion in 1982, more than 109 times. Government expenditure in 2020 was BDT 4170.36 billion that of BDT 52.35 billion in 1982, more than 80 times. The budget deficit in 2020 was BDT -1518.6 billion that of BDT -27.95 billion in 1982, more than 54 times. Bangladesh experiences a surplus budget for the first time from 1991 to 1994. After that, it was always a deficit, but in 2018 it reached double digits in percentage. In 2018 it was 10.21%; in 2019 was 12.49% and in 2020 was 13.23%.

Figure 1: Trends of budget deficit in Bangladesh
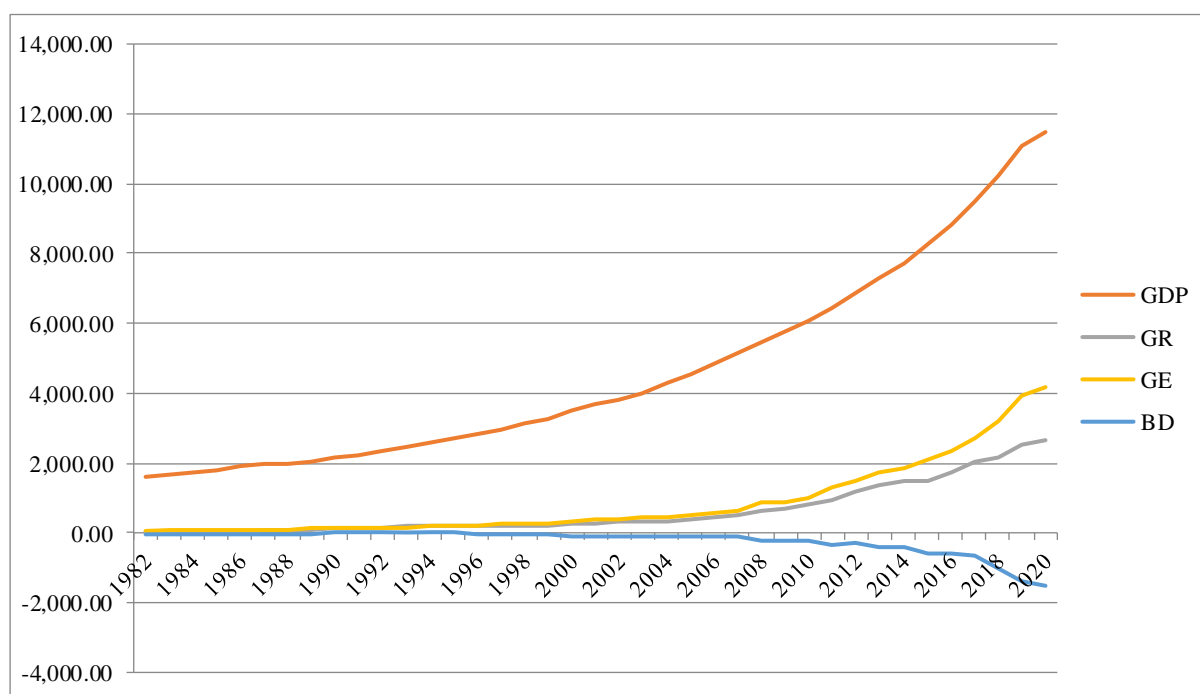
Source: World Economic Outlook Databases, International Monetary Fund (IMF).

Fiscal shortage as a percentage (BDP) of the GDP of Bangladesh was consistently declined over the decades. From 1982 to 1990, it was an average of 1.84%, which improved in 90 decades by 0.81%; from 2001-2010, it was 2.97%, and in the last ten years, it jumped to 7.73% on average.

Table 1: Economic growth and Budget deficit of Bangladesh

Period	EGR	BDP
1982-1990	3.72	-1.84

1991-2000	4.80	-0.81
2001-2010	5.75	-2.97
2011-2020	6.58	-7.73

Source: World Economic Outlook Databases, International Monetary Fund (IMF).

Bangladesh's economic growth rate (EGR) continuously improved over the decades. From 1982-1990 it was 3.72%, which reached 4.8% in 1991-2000, 5.75% in 2001-2010 and 6.58% in 2011-2020.

Figure 2: Economic growth and Budget deficit of Bangladesh.
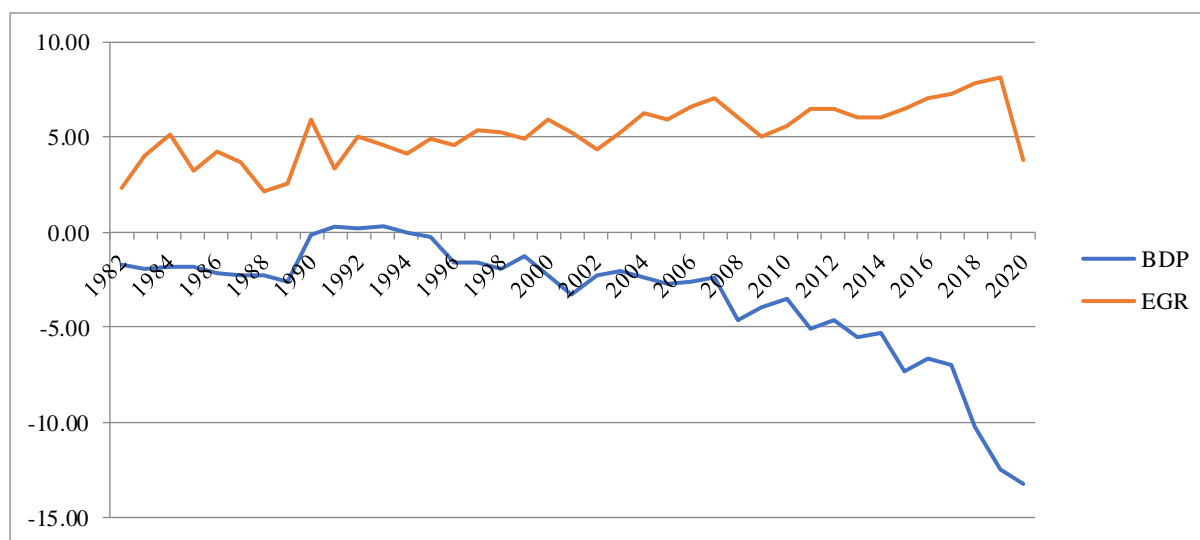
Source: World Economic Outlook Databases, International Monetary Fund (IMF).

4.1.2 Descriptive Statistics

Summary statistics show that the economic growth rate of Bangladesh is an average of 5.25% and platy kurtic with left tailed while it is 5.16. The budget deficit percentage mean of Bangladesh was 3.38%, and that for Sri Lanka was 5.06% which is 50% higher than that of Bangladesh. Sri Lankan BDP was left tailed with leptokurtic having a value of 4.47. Bangladeshi BDP was also left-tailed, but platy kurtic having a value of 2.7, is almost meso kurtic.

Table 2: Summary statistics of variables - Bangladesh

	EGR-BDG	BDP-BDG
Mean	5.25	-3.38
Median	5.26	-2.31
Standard Deviation	1.45	3.19
Kurtosis	-0.29	2.70
Skewness	-0.22	-1.62
Minimum	2.16	-13.23
Maximum	8.15	0.30
Number of years	39	39

Source: Authors' estimation using World Economic Outlook Databases, International Monetary Fund (IMF).

4.1.3 Correlation Analysis

The following table concludes a moderate inverse correlation between fiscal shortage and the gross domestic product of Bangladesh.

Table 3: Correlation Matrix - Bangladesh

BDG	BDP	EGR
BDP	1	
EGR	-0.46	1

Source: Authors' estimation using World Economic Outlook Databases, International Monetary Fund (IMF).

4.1.4 Unit Root Analysis

Table 4 exhibits the Augmented Dickey-Fuller test results for all variables from Bangladesh's perspective. ADF tests assumed the Null Hypothesis stationary. The

Table 4 depicts that Z-statistics of stationary tests which represents the value of test statistics for BDP was 1.950, which is less than the critical values of 3.668, 2.966, and 2.616 are significant levels. So, we cannot reject null hypotheses; series have a unit-root or are not stationary. The first difference value of test statistics for DBDP was 3.971, which is greater than the critical values of 3.675, 2.969, and 2.617 are significant at the maximum level. So, all datasets are stationary. The value of the t statistic for EGR was 2.417, which is less than the critical values of 3.668, 2.966, and 2.616 are significant at all levels. So, the series has a unit-root or is not stationary. The first difference value of test statistics for DEGR was 6.703, which is greater than that of the critical values of 3.675, 2.969, and 2.617 are significant at all levels. So, the series has no unit-root or stationery.

Table 4: Stationary Test - Bangladesh

Bangladesh	Test Statistic	1% Critical Value	5% Critical Value	10% Critical Value
BDP				
Z-statistics	1.950	-3.668	-2.966	-2.616
DBDP				
Z-statistics	-3.971	-3.675	-2.969	-2.617
EGR				
Z-statistics	-2.417	-3.668	-2.966	-2.616
DEGR				
Z-statistics	-6.703	-3.675	-2.969	-2.617

Source: Authors' estimation using World Economic Outlook Databases, International Monetary Fund (IMF).

4.1.5 Lag Selection Analysis

The following table exhibits the result of lag selection criteria using various criteria methods like FPE, AIC, HQIC, and SBIC. Several criteria indicate different lag orders. Few methods suggested lag number 1, and some suggested lag number 3. In this case, econometricians concluded to select a minimum lag number for searching for other relationships is best. That is why the study considers the lag number should 1 for Bangladesh.

Table 5: Lag test - Bangladesh

Lag	LL	LR	DoF	P	FPE	AIC	HQIC	SBIC
0	-147.249				17.3362	8.52852	8.6174	
1	-100.653	93.191	4	0.000	1.52131	6.09448	6.18652*	6.36111*
2	-99.0874	3.132	4	0.536	1.75374	6.23357	6.38697	6.67795
3	-90.8135	16.548*	4	0.002	1.38337*	5.98934*	6.20411	6.61148
4	-90.6761	0.27478	4	0.991	1.74704	6.21006	6.48619	7.00996

Source: Authors' estimation using World Economic Outlook Databases, International Monetary Fund (IMF).

4.1.6 Rank Analysis

The following table confirms one co-integrating equation.

Table 6: Rank test - Bangladesh

Max rank	Parms	LL	Eigenvalue	Trace Statistic	5% Critical Value	1% Critical Value
0	2	-117.6129	.	18.2663	15.41	20.04
1	5	-108.50832	0.38071	0.0572*	3.76	6.65
2	6	-108.47973	0.00150			

Source: Authors' estimation using World Economic Outlook Databases, International Monetary Fund (IMF).

4.1.7 VECM Analysis

The study observed the value of both statistics at a maximum significance level. Since 0.0572 < 3.76 and 6.65, then verify a co-integrating relation. Both results conclude that there is one co-integrating equation. So, the study should run VECM to estimate the expected relation to Bangladesh.

Table 7: Short and Long-term Relation Test - Bangladesh

Dependent Variable	Independent Variable	Coef.	Std. Err.	z	p>z
Economic Growth (1st difference)	Error Correction Term	-2.073661	.2485881	-8.34	0.000
	Δ Economic Growth (lagged)	.4872165	.1536585	3.17	0.002
	Δ Budget Deficit (lagged)	-.6502108	.1282893	-5.07	0.000
	Constant	-.0106068	.1643017	-0.06	0.949
Budget Deficit (1st difference)	Error Correction Term	.2833395	.3380624	0.84	0.402
	Δ Economic Growth (lagged)	-.1384081	.2089648	-0.66	0.508

| | Δ Budget Deficit (lagged) | -.4359897 | .1744644 | -2.50 | 0.012 |
| | Constant | -.0776271 | .2234388 | -0.35 | 0.728 |

Validating the short term

Equation	Parms	χ2	P>χ2
Error Correction Term	1	17.34947	0.0000

Validating Long term

	beta	Coef.	Std. Err.	z	P>z
Error Correction Term	Δ Economic Growth	1.000	-	-	-
	Δ Budget Deficit	-.4390146	.1053989	-4.17	0.000
	Constant	-.1654126	-	-	-

Source: Authors' estimation using World Economic Outlook Databases, International Monetary Fund (IMF).

From the above test output, the error correction term (-2.073661) and coefficient of EGR (0.4872165) and BDP (-.6502108) are all significant at the maximum level. The model confirms a short-run relation within the studied variables of Bangladesh. The value of the Error Correction Term of the co-integrating equation was verified at the maximum level. Johansen's normalized restriction-imposed model depicts an inverse influence of fiscal shortage on the gross domestic product of Bangladesh for both terms.

4.1.8 Autocorrelation Analysis

The study exhibits the autocorrelation test results, concluding that no autocorrelation was properly specified.

Table 8: Autocorrelation test - Bangladesh

lag	χ2	df	P>χ2
1	14.5486	4	0.005574
2	9.9843	4	0.04069

Source: Authors' estimation using World Economic Outlook Databases, International Monetary Fund (IMF).

4.1.9 Normality Analysis

In the following table, we conducted the normality tests of the residuals and founds that are usually distributed. Jarque and Bera's output accepts the alternative hypothesis; we cannot reject null hypotheses in Skewness and kurtosis. Overall, the study cannot reject the null.

Table 9: Normality of errors test - Bangladesh

Jarque and Bera			
Equation	χ2	df	p > χ2
Δ Economic Growth	5.202	2	0.07418
Δ Budget Deficit	1.298	2	0.52245
ALL	6.501	4	0.16473
Skewness			
Equation	**Skewness**	χ2	df	p > χ2
Δ Economic Growth	-.7929	3.877	1	0.04895

Δ Budget Deficit	-.23839	0.350	1	0.55385
ALL		4.227	2	0.12079

Kurtosis				
Equation	**Kurtosis**	**χ2**	**df**	**p > χ2**
Δ Economic Growth	3.9273	1.326	1	0.24960
Δ Budget Deficit	2.2158	0.948	1	0.33023
ALL		2.274	2	0.32086

Source: Authors' estimation using World Economic Outlook Databases, International Monetary Fund (IMF).

4.1.10 Stability and Validity Analysis

Table 10 shows the output of the stability test of the eigenvalues. It concluded that the studied model was specific.

Table 10: Stability condition Test - Bangladesh

Eigenvalue		**Modulus**
1		1
-.3109352	+ .6923868i	.758999
-.3109352	- .6923868i	.758999
-.5249545		.524954

Source: Authors' estimation using World Economic Outlook Databases, International Monetary Fund (IMF).
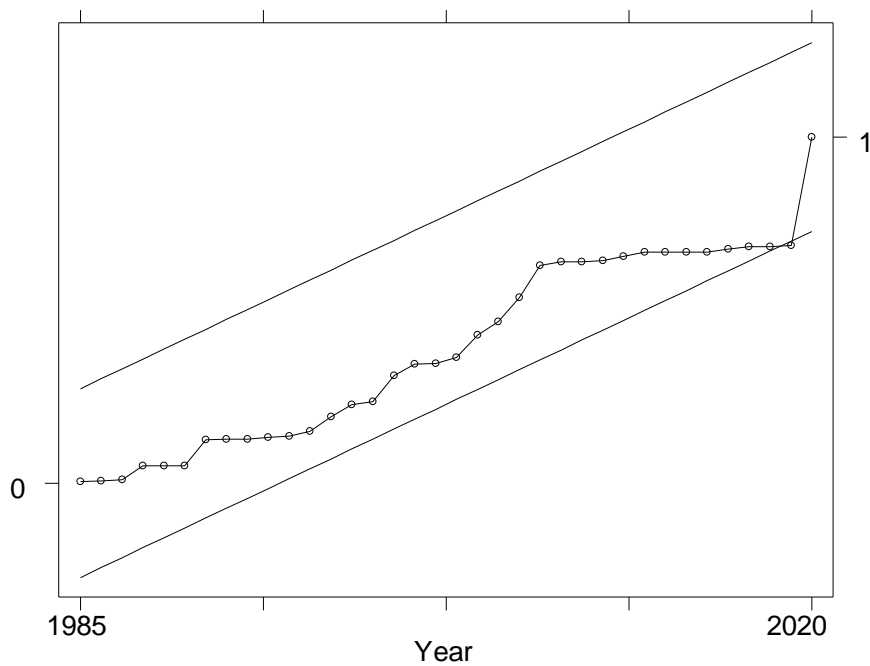
Figure 3. Unit-root circle graph - Bangladesh
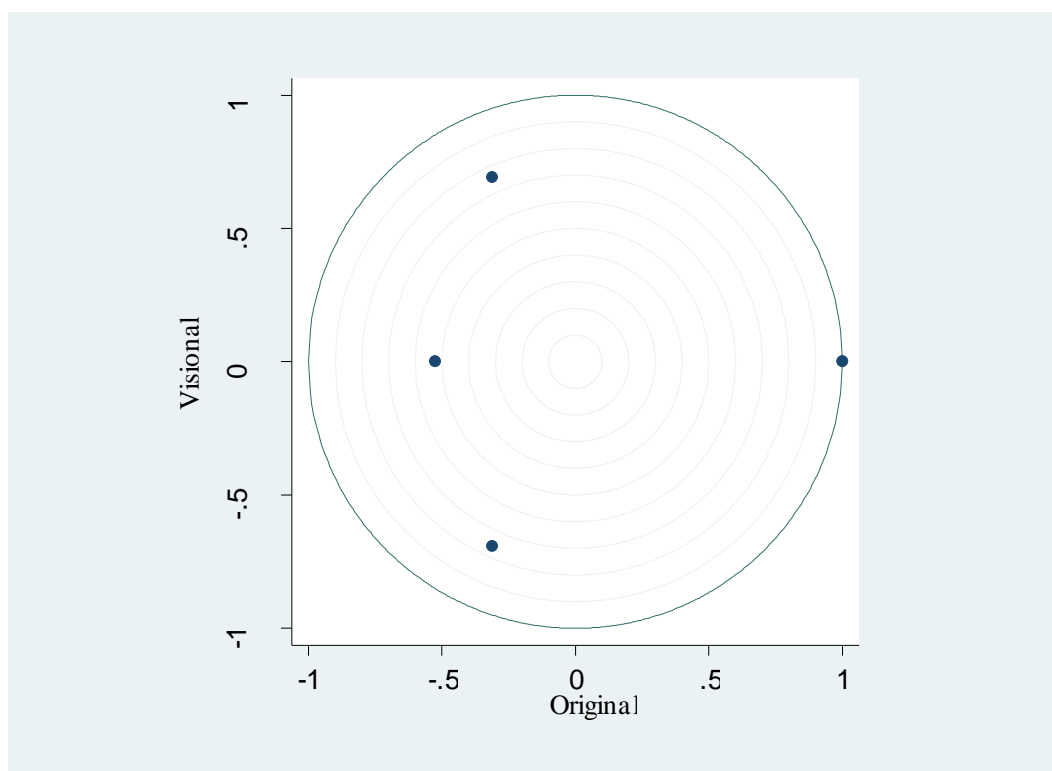
Source: Authors' estimation using World Economic Outlook Databases, International Monetary Fund (IMF).

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The study conducted companion matrix validates a co-integrating equation. We sketch eigenvalues to visualize a graph. We found that no one eigenvalue is close near the unit circle, confirming that the model is specified accurately.

Figure 3 identified that the upper and lower bounds of recursive residual values over the whole period (year to year) are plotted. All values are within the boundaries at a 5% significance value, which means that the model was most appropriate.

Figure 4: Cusum square graph - Bangladesh

Source: Authors' estimation using World Economic Outlook Databases, International Monetary Fund (IMF).

4.1.11 Heteroskedasticity Analysis

The null and alternative hypothesis of heteroskedasticity test are:

H_0: There is no heteroskedasticity

H_1: There is heteroskedasticity

The probability value was Chi2 test of heteroskedasticity test is 0.0214, so we do reject null hypothesis at 5% level of significance indicating heteroskedasticity was found at 5% level of significance. We used robust standard errors to address heteroskedasticity.

Table 11: Heteroskedasticity test - Bangladesh

| Source	Chi2	DF	P-value
Heteroskedasticity	7.69	2	0.0214
Skewness	16.69	1	0.0000
Kurtosis	1.24	1	0.2661
Total	25.62	4	0.0000

Note: chi2(2) = 7.69; Prob > chi2 = 0.0214.
Source: Authors' estimation using World Economic Outlook Databases, International Monetary Fund (IMF).

4.2 Empirical Analysis of Sri Lanka

4.2.1 Trend Analysis

Sri Lankan GDP is consistently rising over the period. The GDP of Sri Lanka in 2020 was Lankan Rupee 9530.61 billion that of Lankan Rupee 1592.54 billion in 1982, which was more than six times. Government revenue in 2020 was Lankan Rupee 1440.73 billion that of Lankan Rupee 74.67 billion in 1990, more than 19 times. Government expenditure in 2020 was Lankan Rupee 3220 billion that of Lankan Rupee 99.81 billion in 1990, more than 32 times. The budget deficit in 2020 was Lankan Rupee -1779.3 billion in 1990 that of Lankan Rupee -25.15 billion, which was more than 71 times. Sri Lanka experiences a continuous budget deficit from 1990 to 2020. In 2019 it was -12.43%, 2020 was 18.67%. The following table summarizes the trends of the budget deficit.

Figure 5: Trends of Budget deficit of Sri Lanka.
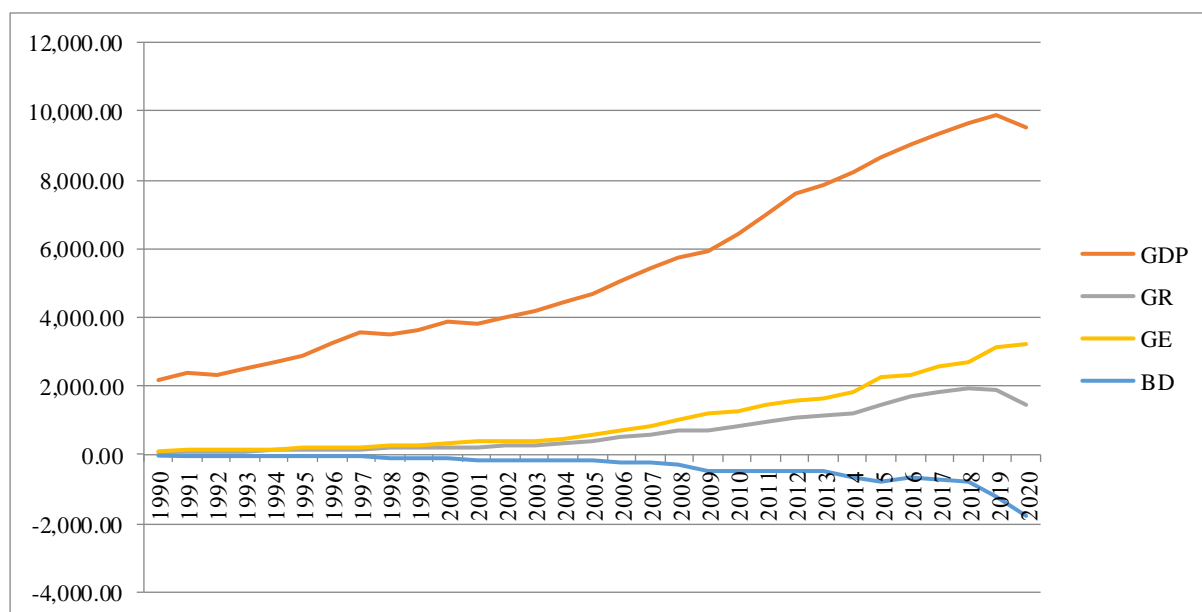
Source: World Economic Outlook Databases, International Monetary Fund (IMF).

*Table 12: Economic growth and Budget deficit of Sri Lanka.*

Period	EGR	BDP

1991-2000	6.14	-1.93
2001-2010	5.14	-4.65
2011-2020	4.09	-8.99

The fiscal shortage ratio to the gross domestic product of Sri Lanka was consistently declined over the decades. From 1990 to 2020, it was an average of 1.93%, improved in 2001-2010 was 4.65%, and jumped to 8.99% on average for the last ten years.

Figure 6: Economic growth and budget deficit of Sri Lanka.
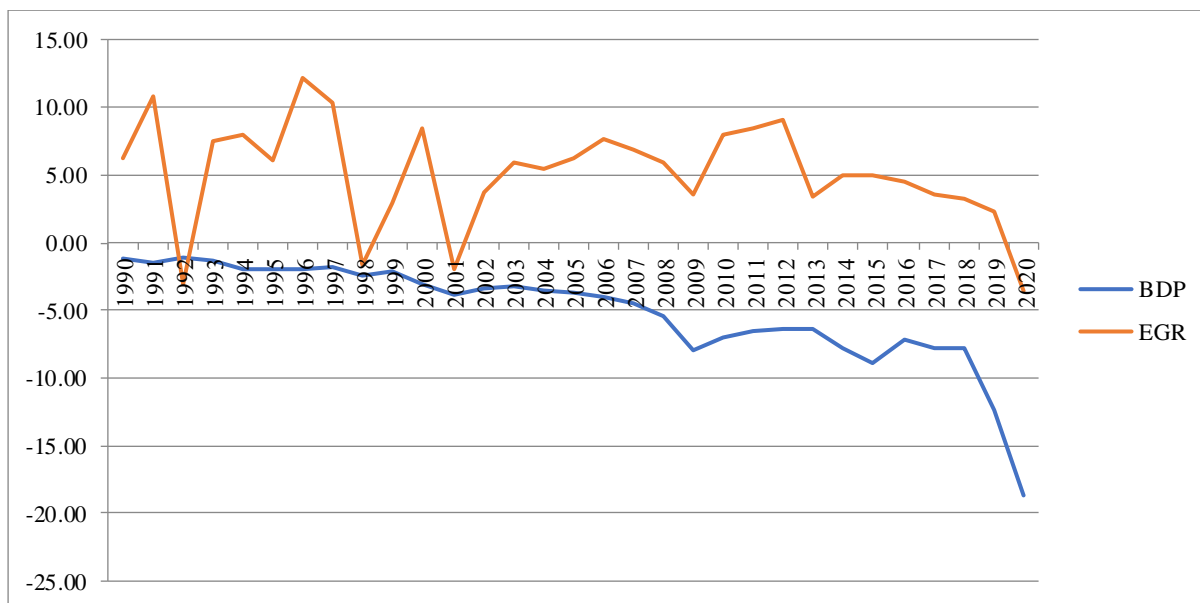
The economic growth rate of Sri Lanka was continuously decreased over the decades. From 1990-2020 it was 6.14% in the period 1990-2000, which decreased to 5.14% in 2001-2010 and 4.09% in 2011-2020. Not only that, it became negative in 1992 was -3.14%; in 1998, it was -1.65%; in 2001, it was -1.95%, and in 2020 was -3.57%.

4.2.2 Descriptive Statistics

Summary statistics show that the economic growth rate of Sri Lanka is an average of 5.16% and platy kurtic with left tailed. The budget deficit percentage mean of Bangladesh was 3.38%, and that for Sri Lanka was 5.06% which is 50% higher than that of Bangladesh. Sri Lankan BDP was left tailed with leptokurtic having a value of 4.47.

Table 13: Summary statistics of variables - Sri Lanka

	EGR-SLNK	BDP-SLNK
Mean	5.16	-5.06
Median	5.94	-3.82

Standard Deviation	3.87	3.78
Kurtosis	0.34	4.47
Skewness	-0.67	-1.77
Minimum	-3.57	-18.67
Maximum	12.16	-1.10
Number of years	31	31

Source: Authors' estimation using World Economic Outlook Databases, International Monetary Fund (IMF).

4.2.3 Correlation Analysis

The following table concludes a weak positive correlation between fiscal shortages to the gross domestic product of Sri Lanka.

Table 14: Correlation Matrix - Sri Lanka

	BDP	EGR
BDP	1	
EGR	0.39	1

Source: Authors' estimation using World Economic Outlook Databases, International Monetary Fund (IMF).

4.2.4 Unit Root Analysis

Table 15 exhibits the Augmented Dickey-Fuller test results for all variables of the Sri Lankan perspective. ADF tests assumed that the Null Hypothesis is not stationary. Table 15 depicts that the value of test statistics for BDP was 1.475, which is less than the critical values of 3.723, 2.989, and 2.625 at is significant at all levels. So, the series has a unit root or is not stationary. The third difference value of test statistics for d3bdp was 6.498, which is greater than the critical values of 3.743, 2.997, and 2.629, which are significant at all levels. So, the series has a unit root or stationary. T-value for EGR was 3.660, which is less than the critical values of 3.723, 2.989, and 2.625 at the maximum significance level. So, the series has a unit root or is not stationary. The first difference value of test statistics for DEGR was 8.204, more significant than the critical values of 3.730, 2.992, and 2.626 at the maximum significance level. So, the series has no unit root or stationary. ADF test results guided the study to select different models for two studied datasets. Since the datasets are not stationary and at the same level and degree, a specific model was chosen for the different country datasets. Then the study should discuss the empirical output differently since the Augmented Dickey-Fuller tests found that the datasets are stationary at a different level. So, the study suggests that the Autoregressive Distributed Lag model is best for exploring different relationships within the studied variables of Sri Lanka.

Table 15: Stationary Tests - Sri Lanka

Sri Lanka	Test Statistic	1% Critical Value	5% Critical Value	10% Critical Value
		BDP		
Z-statistics	1.475	-3.723	-2.989	-2.625
		D3BDP		
Z-statistics	-6.498	-3.743	-2.997	-2.629
		EGR		
Z-statistics	-3.660	-3.723	-2.989	-2.625
		DEGR		
Z-statistics	-8.204	-3.730	-2.992	-2.626

Source: Authors' estimation using World Economic Outlook Databases, International Monetary Fund (IMF).

4.2.5 Lag Selection Analysis

Table 16 exhibits the result of lag selection criteria using various criteria methods like LR, DF, FPE, etc. Most indicators select number 1: LR, FPE, AIC, HQIC, and SBIC.

Table 16: Lag test - Sri Lanka

Lag	LL	LR	DF	P	FPE	AIC	HQIC	SBIC
0	-142.411				151.63	10.6971	10.7257	10.7931
1	**-115.983**	**52.856***	**4**	**0.000**	**28.8438***	**9.03581***	**9.12143***	**9.32377***
2	-113.487	4.9934	4	0.288	32.4615	9.14716	9.28987	9.6271
3	-111.668	3.6366	4	0.457	38.7541	9.30877	9.50857	9.98069
4	-109.484	4.369	4	0.358	45.6253	9.44325	9.70013	10.3071

Source: Authors' estimation using World Economic Outlook Databases, International Monetary Fund (IMF).

4.2.6 Rank Analysis

Since 5.64>6.65 and 5.64< 3.76 at a 5% significance level but less than 1% significance level, that validates a co-integrating relation within studied variables at a 1% significance level. The statistic found the same result. Since the elements are stationary in a different order, we cannot choose Johansen cointegration equation. So, the study should run the ARDL model for estimating the relation of Sri Lanka.

Table 17: Rank test - Sri Lanka

max rank	params	LL	Eigenvalue	Trace statistic	5% Critical Value	1% Critical Value
0	2	-146.52883	.	28.9708	15.41	20.04
1	5	-134.86716	0.54042	5.6474*	3.76	6.65
2	6	-124.86353	0.06749			

Source: Authors' estimation using World Economic Outlook Databases, International Monetary Fund (IMF).

4.2.7 Lag Order Analysis

We need to know the lag level to run the ARDL model. Table 17 shows that the lag level of EGR and BDP are 1 and 0, respectively.

Table 18: Lag Matrix - Sri Lanka

	EGR	BDP
r1	1	0

Source: Authors' estimation using World Economic Outlook Databases, International Monetary Fund (IMF).

4.2.8 ARDL Analysis

Since F value 15.407> 4.04-6.84, we can reject null, which means there is a co-integrating equation between them.

Since t value -5.414< -2.91 to -3.82, we can reject null, which means there is a co-integrating equation between them. Both statistics found the same result.

Table 19: Autoregressive Distributed Lag test - Sri Lanka

	[I_0] L1	[I_1] L1	[I_0] L05	[I_1] L05	[I_0] L025	[I_1] L025	[I_0] L01	[I_1] L01
K1 (F = 15.407)	4.04	4.78	4.94	5.73	5.77	6.68	6.84	7.84
K1 (t = -5.414)	-2.57	-2.91	-2.86	-3.22	-3.13	-3.50	-3.43	-3.82

Source: Authors' estimation using World Economic Outlook Databases, International Monetary Fund (IMF).

We can validate both long and short-term connections within the output, but they are not significant at the same level. The study concluded a long-run direct influence of budget shortage on the gross domestic product at 0.3878 per cent, and the adjustment term is -1.07269, which is highly significant.

Table 20: Error-correction model of ARDL - Sri Lanka

	Coefficient	St. Er.	t	p>t
Economic Growth	-1.07269	.1981464	-5.41	0.000
LR Budget Deficit	.3878408	.1762619	2.20	0.037
Constant	7.677983	1.724839	4.45	0.000

Source: Authors' estimation using World Economic Outlook Databases, International Monetary Fund (IMF).

4.3 Robustness Test

4.3.1 Robustness Tests of the Econometric Models

The examinations of specification misconception relates inflated strategy that recommend a model as the 'Ideal' one for the intention of the analysis, ordain which way our existing model be unlike from this and what is the results of that unlikeness, and thereby get some knowledge of how value the misinterpretation we will automatically make, may be. Sometimes it is possible to secure genuine comfort by this route.

4.3.2 Autocorrelation Analysis

Since the value 0.4234 is greater than 0.05, it concludes no autocorrelation.

Table 21: Autocorrelation Test - Sri Lanka

Lags(p)	χ^2	df	$p>\chi^2$
1	0.641	1	0.4234

Source: Authors' estimation using World Economic Outlook Databases, International Monetary Fund (IMF).

4.3.3 Normality Analysis

The above shows the results of normality of errs test of the residuals and founds that are usually distributed. Jarque-Bera's output found that we accept alternative hypotheses in Skewness and kurtosis; we cannot reject null hypotheses. Overall, the study cannot reject the null. Residuals are normally distributed.

Table 22: Normality of Errors test - Sri Lanka

Jarque-Bera			
Equation	χ^2	**Df**	$p>\chi^2$
Δ Economic Growth	0.169	2	0.91903
Δ Budget Deficit	0.968	2	0.61635
ALL	1.137	4	0.88839
Skewness			
Equation	**Skewness**	χ^2	**Df**	$p>\chi^2$
Δ Economic Growth	-.1552	0.116	1	0.73294
Δ Budget Deficit	-.32802	0.520	1	0.47081
ALL		0.636	2	0.72742
Kurtosis			
Equation	**Kurtosis**	χ^2	**Df**	$p>\chi^2$
Δ Economic Growth	2.7917	0.052	1	0.81885
Δ Budget Deficit	3.6088	0.448	1	0.50337
ALL		0.500	2	0.77869

Source: Authors' estimation using World Economic Outlook Databases, International Monetary Fund (IMF).

4.3.4 Stability and Validity Analysis

Table 23 shows the output of the stability test of the eigenvalues. It concluded that the studied model was specific.

Table 23: Stability condition Test - Sri Lanka

Eigenvalue		Modulus
1		1
.71785291		.717853
-.1355187	+ .4430237i	.463287
-.1355187	.4430237i	.463287

Source: Authors' estimation using World Economic Outlook Databases, International Monetary Fund (IMF).

Figure 7: Unit-root circle graph - Sri Lanka
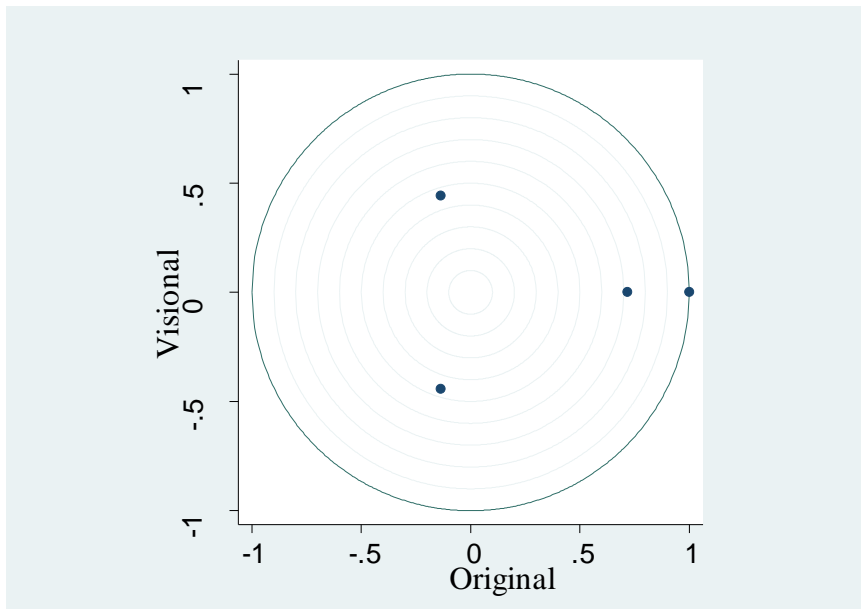
The study conducted by the companion matrix validates one co-integrating equation. We sketch eigenvalues to visualize a graph. We found that no one eigenvalue is not close near to the circle of the unit that validates the model is specified accurately.

Figure 8: Cusum square graph - Sri Lanka
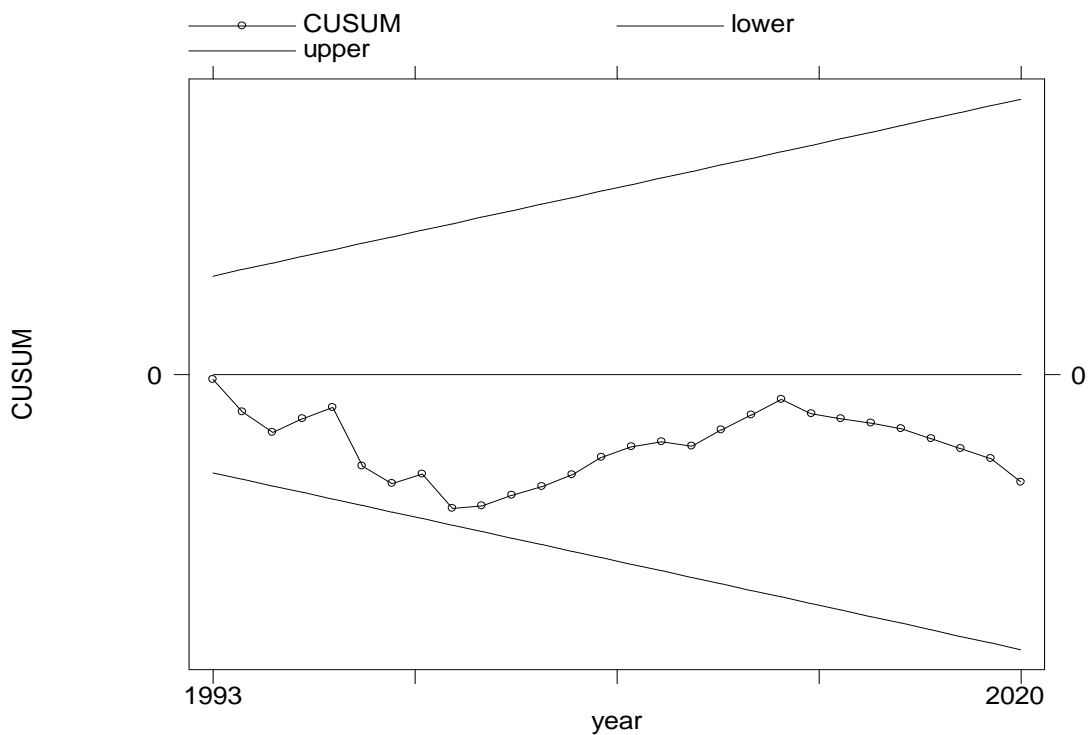
38

The above figure identified that the upper and lower bounds of recursive residual values over the whole period (year to year) are plotted. All values fall within boundaries at a 5% significance value, which means that the model was most appropriate.

4.3.5 Heteroskedasticity Analysis

The null and alternative hypothesis of heteroskedasticity test are:

H_0: There is no heteroskedasticity

H_1: There is heteroskedasticity

The probability value was Chi2 test of heteroskedasticity test is 0.087, so we do reject null hypothesis at 10% level of significance indicating heteroskedasticity was found at 10% level of significance. We used robust standard errors to address heteroskedasticity.

Table 24: Heteroskedasticity Test - Sri Lanka

Source	Chi2	Df	P-value
Heteroskedasticity	4.87	2	0.0875
Skewness	7.29	1	0.0069
Kurtosis	2.12	1	0.1453
Total	14.28	4	0.0064

Note: chi2(2) = 4.87; Prob > chi2 = 0.0875
Source: Authors' estimation using World Economic Outlook Databases, International Monetary Fund (IMF).

4.4 Comparative analysis

The study compares the empirical results of both country's empirical analysis in the following table:

Table 25: Comparative picture of Bangladesh and Sri Lanka

Base of comparison	Bangladesh	Sri Lanka
Trends	Economic Growth Rate-Upward	Economic Growth Rate-downward
	Budget deficit percentage-Upward	Budget deficit percentage-Upward
Correlation	Moderate Negative	Weak Positive
Stationary of data	Same Order	Different Order
Select Model	VECM	ARDL
No of Lags	1	1
No Co-integrating Equations	One	One
Relationship	Negative	Positive
Relationship Degree	-0.439	0.38784
Relationship Term	Have both term relation	Have both term relation
Autocorrelation	No	No

Normality of Errors	Normal	Normal
Model Specification	Not Mis-Specific	Not Mis-Specific
Heteroskedasticity	Yes	Yes

4.5 Findings of the Study

Our rigorous calculation indicated a fluctuating growth rate for these two nations. Despite positive economic indicators, nations are nonetheless feeling the effects of a growing budget imbalance. The study outlined the following based on empirical results. Firstly, there is an upward and downward trend of economic growth in Bangladesh and Sri Lanka, respectively. Secondly, both countries' budget deficit percentage of GDP is increasing over time. Thirdly, Variables are correlated to each other for both countries. Fourthly, there is a negative influence of budget shortage on the economic growth of Bangladesh. Fifthly, the fiscal shortage directly influenced the gross domestic product of Sri Lanka.

CHAPTER FIVE: CONCLUSION

We discussed the influence of the budget ratio's shortfall on Bangladesh's gross domestic product over a long period from 1982-2020 of a dataset collected from the international monetary fund (IMF). Bangladesh and Sri Lanka have budgetary deficits since independence. Secondary quantitative time series data were used for Bangladesh and Sri Lanka from 1982 to 2020. This paper examines how Bangladesh and Sri Lanka's budget deficits influenced their economies.

In the 1980s, Bangladesh's authorities focused on improving industrial efficiency, economic structure, fiscal reform, budgeting, import quotas, and FDI courtship. In 1991-1993, the IMF pressed Bangladesh to change its structure. Bangladesh has battled with a fiscal imbalance, negative trade balance, dependency on aid and grants, and poor tax collection since independence. Sri Lanka's unsustainable debt and balance of payments difficulties hinder growth and poverty. Sri Lanka's real GDP would shrink 9.2% in 2022 and 4.2% in 2023, according to projections. Sri Lanka's fiscal, external, and financial imbalances have increased, causing economic instability. After analysing the vector error correction model, the study found a reverse connection between budget shortfall and gross domestic product growth. These findings support the neo-classical theory of economics, which is opposite to Keynesian economics theory.

According to the study's outcome, Bangladesh should focus more on government spending because planning and quality of spending are essential for sustained economic growth. It is very crucial because the spending purpose determines the output level. If Bangladesh spends more money on unproductive sectors like revenue expenditure and defence expenses rather than productive sectors like tourism, agriculture processing, electronics goods, and parts production, human development, infrastructure development, land-water-rail transport system development, and private sector, to attract foreign direct investment, to create domestic employment production will be increasing that will create crowding out effect in the economy. That is why private sectors suffer a capital crisis. The investment in the private sector might be reduced, and the production or contribution of the private sector also decreases. The consequence is that gross domestic production may hamper that and downgrade gross domestic product growth.

The government money spending authority should give more attention to the cost-benefit analysis scenario for the expenditure of a single penny. They may update or develop a standard operating procedure to spend money and budget variance analysis. Other factors are corruption,

bureaucratic complexity, lack of transparency, proper accounting, good governance, and incompetency, the barrier to public money spending utilities. More valuable and productive sector spending of people every currency must boost economic growth. Bangladesh's government may train their employees and the private sector to improve in choosing where and how the money should be spent. Project implementation capacity and procedure of development work hamper economic growth because the development projects are executed at a delay time below the desired quality. It increases the monetary and social cost and downgrades the cost-benefit ratio in monetary and financial aspects.

The study observes that the budget deficit percentage of gross domestic product is increasing daily and over the studied period. It creates extra pressure on the economy of Bangladesh. Since the studied result showed the reverse influence of budget shortage on gross domestic production, Bangladesh should focus more on reducing the budget deficit. The source of deficit financing and the way of reducing the budget deficit are the two dimensions of the budget deficit. Loans from domestic sources and loans from abroad are the sources of fiscal deficit financing for a country. Loans from the local commercial bank, issuing bonds, and government security certificates are well-known sources of fiscal deficit financing. It creates interest pressure and reduces private investment. International sources of finance are loans from other countries, world development partners, and development agencies. Most of cases they impose stringent conditions and higher interest rates. It also reduces foreign currency reserve, increases trade balance, and might increase inflation, real exchange rate, cost of production decrease purchasing power.

Results are varied from case to case. The budget deficit percentage of gross domestic product is the leading player in reducing the gross domestic product growth in the case of Bangladesh. It is directly related to government fiscal policy decisions that are interdependent on monetary policy decisions. The first government of Bangladesh should harmonize fiscal policy with monetary policy. Collecting more revenue or reducing expenditure is the way to reduce the budget deficit. Collection of revenue increases by increasing tax net, tax rate, and tax base, imposing more duty, levy on new items, or increasing rate. Value-added tax switching in the faint hope of collecting more revenue for Bangladesh. VAT collection is increasing year to year. The Bangladesh government should restructure Bangladesh's direct and indirect tax system by concealing the loopholes of tax evasion from the viewpoint of a practical, reliable, effective, and efficient manner. Another way is government must reduce expenditure on non-

production and luxury purposes. The study suggests that the Bangladesh government should take necessary policy actions to achieve a surplus budget.

We discussed the influence of fiscal shortage on the gross domestic product growth of Sri Lanka for an extended period from 1990-2020 of a dataset collected from the international monetary fund (IMF). After analysing the autoregressive distributed lag model, the study concluded a connection between the shortfall of budget on gross domestic product growth. These findings support the Keynesian theory of economics, which is opposite to the neo-classical theory of economics. According to the study's outcome, Sri Lanka should focus more on government spending because planning and quality of spending are crucial for sustained economic growth. It is very crucial because the spending purpose determines the output level. If Sri Lanka spends more money on unproductive sectors like revenue expenditure and defence expenses rather than productive sectors like tourism, agriculture processing, human development, infrastructure development, water transport system development, and private sector, to attract foreign direct investment, to create domestic employment production will be increasing that will create crowding in effect in the economy. So, the private sector will get more money to invest. The investment in the private sector might increase, and the production or contribution of the private sector also increases. The consequence of that gross domestic product may boost what is expected for the Sri Lankan economy.

As opposed to the quality of spending means the way or procedure of spending. The government money spending authority should give more attention to the cost-benefit analysis scenario for the expenditure of a single penny. They may update or develop a standard operating procedure to spend money and budget variance analysis. Other factors are corruption, bureaucratic complexity, lack of transparency, proper accounting, good governance, and incompetency, the barrier to public money spending utilities. More valuable and productive sector spending of people every currency must boost economic growth. Sri Lanka government may train their employees, but the private sector does their own to improve in choosing where and how the money should be spent. Poor project implementation capacity and lengthy procedure of development work hamper economic growth because the development projects are executed in a delayed time and below the desired quality, which reduces total output. It increases the monetary and social cost and downgrades the cost-benefit ratio in monetary and financial aspects. The study observes that the budget deficit percentage of gross domestic product is increasing daily and over the studied period. In this situation, the fiscal shortage is a blessing for the Sri Lankan economy to achieve higher gross domestic production.

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