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IMPACT OF EXTERNAL DEMAND AND DOMESTIC DEMAND ON ECONOMIC GROWTH OF SRI LANKA

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Abstract

Strong economic growth is a critical aim for any developing country, including Sri Lanka. Even though many elements influence financial development, this paper predominantly centers around external and domestic demand in Sri Lanka, predicated on the annual time series data from 1960 to 2020. Data were obtained from World Bank Economic Indicator and using the Gross domestic product (GDP) deflator for 2010 (= 100); all the variables were designed in real terms. Household consumption, government consumption and investment were used as the proxy variables for domestic demand, while import and export were used as the proxy variables for external demand. GDP was utilized as the indicator of the economic growth in Sri Lanka. The Johansen Cointegration test was used to confirm the presence of cointegration of the variables. Vector error correction (VEC) test was applied to examine the long-run and short-run relationship between the variables. The direction of causation across variables in the short run was checked via the Granger Causality test. The Johansen Cointegration test shows evidence of one cointegrating vector. The VEC approach recommends that only domestic demand except for investment positively impacts economic growth in the long run, while only external demand has a causal impact on economic growth in the short run. The Granger causality approach shows a unidirectional causality from GDP to government consumption, GDP to investment, import to GDP, export to GDP and export to household consumption, while it shows a bidirectional causality between investment and government consumption. Consequently, both external and domestic demand is supportive of economic growth in Sri Lanka.

Keywords: GDP, Export, Import, Domestic Demand, Vector Error Correction Model.

1. Introduction

Economic growth means a rise in the manufacture of commercial merchandise and services over time. The best method to measure economic growth is the GDP (Ulfah, 2015). It considers the whole economic output of the country and covers all commodities and services produced for sale by companies in the country. Whether they are retailed nationally or abroad is not a matter for it. Economic reduction and growth affect factors both inside and outside the control of the administration and its inhabitants. Natural resources, Human resources, Technology and Capital formation are the four primary drivers of economic growth, although scholars' priority assigned to each variable was always varied (Boldeanu and Constantinescu, 2015).

Although emerging nations' real per capita GDP growth was above the global average, they had poor socioeconomic circumstances (Upreti, 2015). Despite foreign support and assistance, developing countries have been unable to thrive and prosper due to economic traps, including conflicts or wars, profit-seeking on natural resources, reliance on just one neighbouring nation, and an absence of the rule of law (Collier, 2007).

According to the International Monetary Fund (IMF) reports, the Sri Lankan economy is based on buying power uniformity is the second-highest in the South Asian area based on per capita revenue. During the 19th and 20th centuries, Sri Lanka made a nationwide export trademark by possessing a well-known plantation economy to manufacture and export Rubber, Cinnamon and Ceylon tea. Sri Lanka became a center of trade due to the development of the harbors beneath British rule (Bandarage, 1982). The administration's commercial policies were strongly influenced by social democracy from 1948 to 1977. As a result, industries were nationalized, colonial plantations were pulled apart, and a welfare state was launched. Since 1977, the Sri Lankan government has adopted privatization and an open economy to compete globally (Course, 2017).

After the independence, Sri Lanka reported the first drop in GDP in 2001 as -1.5% (Staff Writer, 2020). Universal and national economic chaos like terrorist attacks within Sri Lanka and intercontinental effects ruin the country's economy. After the 2002 ceasefire, the economy raised averaging 6.2%, regardless of many domestic and external shocks containing extraordinary worldwide oil prices, Tamil Elam Liberation Tigers conflicts, and intense competition for the Multi-Fiber Arrangement exports of garments (Duma, 2007). The recovery in 2006 was aided by a reasonably peaceful political climate and substantial foreign help for tsunami restoration.

A rapid escalation in safety costs occurred due to the continuation of the civilian war in 2005. Nevertheless, after the end of the civilian war in 2009, in 2010, the economy started growing at an 8 percent annual rate (Statistics and Lanka, 2013). The coronavirus pandemic spread in Sri Lanka when the country was mending the terror assaults in April 2019. As a result, the Sri Lankan economy was slender by 3.6 % in 2020, the most deficient growth performance on record, as is the situation in many pandemic-affected nations (ICRA Lanka Limited, 2021).

According to the growth theories, various macroeconomic variables affect economic growth. Growth is deliberated as a demand-led process including external and internal demand in the Keynesian model (Jarra, 2013). Investment, household consumption expenditure, and government consumption expenditure are represented by domestic demand (Tampubolon and Loh, 2020). Export and import are represented by external demand. Expanding domestic demand is a crucial measure to lessen the prevailing economic problems and a strategic desire to ensure a sustainable and fast expansion of the country's economy. The external demand increases due to globalization. Experiencing growth in imports and exports can be seen in a healthy economy. If exports increased rapidly than imports, the overseas economy is much better than the native economy. However, when imports increase while exports are declining, the native economy outperforms overseas markets.

No research has evaluated the influence of external and domestic demand on economic development in Sri Lanka using current data spanning the Covid-19 period. Accordingly, this study attempts to fill that gap because it is worthwhile to recognize what happens to the economic growth of Sri Lanka together with the Covid-19 period data. This research aims to statistically examine the influence of domestic and external demand on economic growth in Sri Lanka and give a broad prediction for policymakers.

This research paper separated into five segments. Introduction is given in segment one and it describes the content of the study. Segment two provides a review of the existing literature, while segment three demonstrates the paper's methodology. Segment four contains empirical results and discussion, whereas Segment five has the final conclusions.

2 Literature Review

Many economists, both nationally and globally, have conducted studies on economic growth utilizing cointegrated and causality approaches and the influence of various factors on economic growth. These are distinct from one another, whether in terms of nation, historical period, sample size, or variable choice.

Tampubolon and Loh (2020) studied the influence of export and domestic demand on North Sumatra's economic growth from 2000 to 2018. Domestic demand was made up of government consumption, private consumption and investment. The Auto-Regressive Distributed Lagged (ARDL) model was used to examine the long-run linkage between the variables and results exposed that domestic demand and economic growth impact each other, whereas export and economic growth have no impact on each other. The short-run relationship was utilized through the Granger causality technique, and it demonstrated that private consumption and investment had a favorable and considerable positive impact on economic growth.

Islam and Hossain (2015) endeavored to inspect the causal relationship between domestic demand, export, and economic growth in Bangladesh from 1971 to 2011. The study utilized two components for domestic demand, namely government consumption, and household consumption. Cointegration and error correction methods were used to find the impact of variables on economic growth, and it was predicted that both domestic demand and export affected both long and short-term economic growth.

Kirshin, et al., (2014) designed a multiple regression model of Russian economic growth. This study was based on information from 2001 to 2013 on the structural aspects of aggregate demand in Russia. The results showed that domestic demand is the most important factor for real GDP growth in Russia. Consumption of households has been proven to be an essential component of domestic demand.

Jarra (2013) used time-series data from 1960 to 2011 to investigate a causal link between Ethiopian domestic demand, exports, and economic growth. Domestic demand was measured using government consumption and household consumption. In the empirical analysis, the Granger causality and Johansen cointegration procedures were used. The outcomes of the Johansen cointegration approach demonstrated the presence of a long-run association between the components. The outcomes of the Granger causality approach revealed a strong link across economic growth and export, as well as across economic growth and domestic demand.

Keho (2018) used time-series data to analyze the link between domestic demand and economic growth in Cote d'Ivoire from 1970 to 2015. Government consumption and household consumption were used as the proxy variables for domestic demand. ARDL bounds testing technique was applied to portray the long-run relationship between the variables, and the Granger causality test was performed to determine the causal linkages among the variables. The empirical findings demonstrated that in both the short-run and long-run, both household and government consumption positively impact economic growth. These outcomes imply that domestic demand might serve as a driver for the rise of the economy in Côte d'Ivoire.

Bakari, (2019) sought to study the relationship between investment, imports, exports, and economic growth in the Brazilian economy from 1970 to 2017. Vector error correction test was used to find both long-run and short-run relationships. In the long run, data show that investment and exports positively influence economic growth, whereas imports have a negative effect. Besides, it revealed that economic growth and imports positively influence investment, whereas exports have a negative impact. Furthermore, the results indicated that economic growth, exports, and domestic investment had no significant influence on imports and that economic growth, domestic investment, and imports had no significant impact on exports. In the short run, outcomes revealed that imports, exports, and domestic investment all-

cause economic growth, whereas exports, imports, and economic growth all-cause domestic investment. Moreover, it stated that economic growth causes exports.

Chawala (2019) analyzed time-series data from 1961 to 2017 to investigate the link between import, export, and economic growth in South Africa. GDP was taken as the indicator of economic growth. The ARDL bounds testing technique was employed to evaluate cointegration, and for testing Granger causality, the Toda-Yamamoto process was used. The outcomes presented that there was a long-run connection between imports, exports, and GDP. The short-run granger causality test proved a unidirectional causality running from export to GDP and bidirectional causality between import and GDP.

Fsegt and El (2017) utilized yearly time series data from 1980 to 2015 to inspect the short-run and long-run influence of exports on economic growth in Gabon through cointegration analysis and an error correction model. The empirical findings revealed that investment and exports negatively impact economic growth in the long run. However, investment and exports cause economic growth in the short run.

Using both Johansen and Juselius cointegration techniques, Aslam (2017) examined the relationship between economic growth and household consumption expenditure in Sri Lanka from 1975 to 2014. Exports, household consumption expenditure, and official development assistant were considered the independent variables, and the gross domestic product was used as the indicator of economic growth. Both methods revealed that consumption expenditure positively influenced the long-run economic growth. Consequently, this study intensely confirmed that consumption expenditure encouraged economic growth in Sri Lanka.

Bakari (2017) explored the connection between investment and Malaysian economic growth. Yearly data from 1960 to 2015 were examined using Correlation analysis, Johansen cointegration analysis of the Vector Error Correction Model, and the Granger-Causality tests. Empirical findings revealed that in the long run, investment, exports, and labor positively influence economic growth, while in the short run, there was no connection between investment and economic growth.

Maitra (2020) investigated a study in India for the post-reform period to check whether the export-led growth, growth-led export, import-led growth, and growth-led import propositions are still valid. The research was grounded on quarterly data from the 1st quarter of 1996 to the 2nd quarter of 2017. The ARDL bounds testing method was applied to depict the long-run relationship between the variables, and the error correction model was used for the short-run investigations. The research discovered substantial evidence of the import-led growth hypothesis, both in the short and long run, indicating that imports had a substantial impact on economic growth; nevertheless, the export-led growth hypothesis happened only in the short run. The examination was additionally able to discover that income and trade openness have instigated a rise in both imports and exports. As income increased both imports and exports, the growth-led import and growth-led export hypotheses were both sustained.

3 Methodology

3.1 Data Collection

The study used a secondary data collection method to study the impact of domestic and external demand on economic growth. Annual time series data for the GDP, final household consumption, government final consumption expenditure, investment, import of goods and services and exports of goods and services for Sri Lanka were obtained for the years 1960 to 2020 from the World Development Indicator of the World Bank. Gross fixed capital formation was occupied as a proxy variable for investment. Using the GDP deflator for 2010 (= 100), all the variables were designed in real terms. Household final consumption, government final consumption expenditure, and investment were used as the components

of domestic demand, while import and export were used as the components of external demand. GDP was used as the indicator of the economic growth in Sri Lanka.

3.2 Model Specification

This study aims to investigate the long-term and short-term relationship of domestic demand and external demand with the economic growth of Sri Lanka. All the variables were converted into the natural logarithmic form to remove the heteroscedasticity issue. The model could be specified as:

$$\text{LGDP= f(LX, LM, LGC, LPC, LI)} \quad (1)$$

The empirical equation can be stated as:

$$LGDP_t = \beta_0 + \beta_1 LX_t + \beta_2 LM_t + \beta_3 LGC_t + \beta_4 LPC_t + \beta_5 LI_t + \varepsilon \quad (2)$$

where LGDP is the natural logarithm of real GDP, LX is the natural logarithm of real export, LM is the natural logarithm of real import, LGC is the natural logarithm of real government consumption, LPC is the natural logarithm of real household consumption, LI is the natural logarithm of real investment, β_0 is a constant term, t is the time trend, ε is the error term, and $\beta_1, \beta_2, \beta_3, \beta_4, \beta_5$ are coefficient terms.

3.3 Estimation Procedures

This segment defines the analyzing procedures. Unit root test, Johansen cointegration test, vector error correction model, Granger causality test, diagnostic test and stability test have been engaged for the analyzing process.

3.3.1 Unit Root Test

Since most time series data have a stochastic process dominated by stochastic trends over time, checking for stationary is critical. Such fluctuated series might lead to spurious regression findings, weakening the policy implications. Experts have refined many techniques for examining the order in which components are integrated. The Augmented-Dickey-Fuller (ADF) technique was used in this study. The ADF test is based on the following model (Dhakal 2016):

$$\Delta Y_t = \alpha_0 + \alpha_1 Y_{t-1} + \gamma t + \sum_i^k c_i \Delta Y_{t-i} + e_t \quad (3)$$

where Y_t is a time series, ΔY_t is the first difference of Y_t (Y_t - Y_{t-1}), Y_{t-1} is the lagged value of order one of Y_t, α_0 is a constant, γ is the coefficient of time trend series, α_1 is the coefficient of Y_{t-1}, K is the order of autoregressive process, c_i is the measure of lag length, ΔY_{t-i} is the changes in lagged values and e_t is the error term.

3.3.2 Johansen Cointegration Test

After the unit root test, examinations for the presence of a long-run association between the variables must be carried out. Cointegration is used to assess the long-run connection among non-stationary time series variables. The series is said to be cointegrated when two or more series are themselves non-stationary; however, a linear combination of them is stationary. The Cointegration tests approach established by Johansen is commonly used to test the long-run relationship between variables. In this method trace test and the maximum eigenvalue test are proposed to estimate the number of cointegrated equations exist in the model. The model could be specified as (Ssekuma and Commerce, 2011):

$$Y_t = \mu_1 Y_{t-1} + \mu_2 Y_{t-2} + \ldots + \mu_p Y_{t-p} + U_t \quad (4)$$

where Y_t is a (6×1) vector of endogenous variables, P is the lag length, μ_i is the estimated coefficients and U_t is a (6×1) vector of residuals.

Different criteria are available to estimate the optimal lag length, namely Schwartz Bayesian Criteria (SC), Akaike Information Criteria (AIC), Hannan-Quinn information criteria (HQ), likelihood ratio test (LR), and Final prediction error (FPE). In this study, optimal lag length is based on the lowest values of HQ and SC criteria.

3.3.3 Error Correction Model

Error correction model is often used for data where the underlying variables have a cointegration. This technique is beneficial for estimating both short-term and long-term effects of one-time series on another. Error correction models assess the rate at which a dependent variable recovers to equilibrium following a change in other variables. The error correction model is as follows (Sims, 1980):

$$\Delta LGDP_t = a_0\, ect_{t-1} + a_1\, \Delta LGDP_{t-1} + a_2\, \Delta LGC_{t-1} + a_3\, \Delta LI_{t-1} + a_4\, \Delta LPC_{t-1} + a_5\, \Delta LM_{t-1} + a_6\, \Delta LX_{t-1} + a_7 \quad (5)$$

where Δ is the difference operator, ect_{t-1} is the error correction term, a_0 is the adjustment effect, and a_2, a_3, a_4, a_5, a_6 are short-run coefficients.

3.3.4 Granger Causality Test

The Granger causality test is used to determine the direction of causation across economic growth and other factors. Two equations are as follows (ElemUche, et al., 2018):

$$Y_t = \sum_{i=1}^{p} \beta_i\, Y_{t-i} + \sum_{j=1}^{q} \gamma_j\, X_{t-j} + e_{1t} \quad (6)$$

$$X_t = \sum_{i=1}^{p} \alpha_i\, X_{t-i} + \sum_{j=1}^{q} \delta_j\, Y_{t-j} + e_{2t} \quad (7)$$

where Y_t and X_t are two variables, e_{1t} and e_{2t} are mutually independent error terms

These two equations were applied to all variables in this study taken two at a time.

4 Results and Discussion

This section deliberates the vital empirical findings based on the approaches outlined in section three.

4.1 Graphical Representation

Typically, time series plots and unit root tests use to examine the stationary patterns. It is a must before establishing an association between the variable. The visual representation of the plotted variables in shows that all the variables are non-stationary in levels. That is due to the trendy behavior portrayed by the variables. All variables show an increasing upward trend which means that mean, variance and covariance are not constant. That affords a clue of a positive influence of export, import, investment, household consumption and government consumption in the growth of the Sri Lankan

economy. Moreover, the figure shows that in 2020 there is a decrease in the economic growth and other variables except for government consumption. It may be due to the covid-19 pandemic situation.

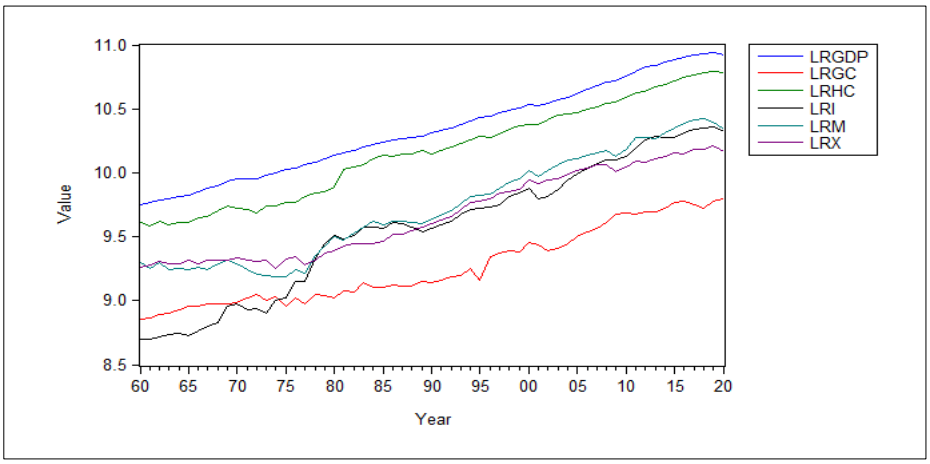

Figure 1: Trends in variables from 1960-2020

4.2 Unit root test

The probability values of the unit root test indicate that the null hypothesis of a unit root considering all variables in levels cannot be rejected at the 5% level. It means all the variables are non-stationary in their level forms. Hence, the ADF test was further applied to the transformed series of each variable to check the stationarity in the first difference. Thus all probability values show a lower value than 0.05, null hypothesis that the series is non-stationary is rejected. So, all the variables are stationary at the first difference, as shown in Table 1. Since all variables are integrated with the same order and observations are more than 50, the Johansen and Juselius cointegration approach can be used to test the long-run relationship of variables.

Table 1: ADF Stationary Test Results

	Augmented Dickey Fuller (ADF) test				
	With Intercept		Trend and Intercept		Order of
Variables	**Levels**	**First Difference**	**Levels**	**First Difference**	**integration**
LGDP	0.9139	0.0004*	0.2865	0.0037*	I(1)
LGC	0.9893	0.0000*	0.7995	0.0000*	I(1)
LI	0.7783	0.0000*	0.7663	0.0000*	I(1)
LM	0.9823	0.0000*	0.1483	0.0000*	I(1)
LHC	0.9757	0.0000*	0.0992	0.0000*	I(1)
LX	0.9736	0.0000*	0.5307	0.0000*	I(1)

4.3 Spurious Issue

The regression output is shown in below

Table 3. All the variables in the regression model are significant at a 1% level. Also, the model is significant at a 1% level. Therefore, it is a good model. Here Durbin-Watson value (1.966) is more significant than the R-squared value (0.998). So, reject the null hypothesis, which means that spurious issues do not exist. The probability value of the residual

diagnostic is less than 0.05, as shown in Table 2, which means that rejecting the null hypothesis of the residual series is non-stationary. So residuals are stationary at level. Therefore, no spurious issue within the variables. It means that a cointegration or long-run equilibrium relationship exists within the variables.

Table 2: Residual Diagnostics

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-4.929337	0.0001
Test critical values:	1% level	-3.544063	
	5% level	-2.910860	
	10% level	-2.593090	

Table 3: Regression Analysis Result

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LGC	0.353418	0.036512	9.679388	0.0000
LI	0.224196	0.030994	7.233398	0.0000
LM	-0.317951	0.052543	-6.051250	0.0000
LHC	0.470744	0.065480	7.189168	0.0000
LX	0.279996	0.059642	4.694624	0.0000
C	0.518348	0.158168	3.277193	0.0018
R-squared	0.997758	Prob(F-statistic)		0
Adjusted R-squared	0.997554	Durbin-Watson stat		1.966128

4.4 Optimal Lag Length

Optimal lag order obtains by using VAR lag order selection criteria. This technique is essential for further analysis of this study, namely the Johansen cointegration test, vector error correction model and causality test. Schwarz Information Criterion, Hannan-Quinn Information Criterion, and Akanke Information Criterion are the most common criteria used to obtain the optimal lag length. According to Table 4, lag 1 gives minimum values for SC and HQ criteria. So optimal lag length is 1.

Table 4: Lag Structure

Lag	LogL	LR	FPE	AIC	SC	HQ
0	438.5296	NA	7.88e-15	-15.44749	-15.23048	-15.36335
1	823.3766	673.4822	3.08e-20	-27.90631	-26.38729*	-27.31739*
2	864.8586	63.70455	2.65e-20*	-28.10209	-25.28107	-27.00839
3	902.2261	49.37845	2.83e-20	-28.15093	-24.02789	-26.55244
4	929.8718	30.60770	4.84e-20	-27.85256	-22.42751	-25.74928
5	991.3976*	54.93377*	3.00e-20	-28.76420*	-22.03714	-26.15613

* Indicates lag order selected by the criterion
LR: sequential modified LR test statistic (each test at 5% level)
FPE: Final prediction error
AIC: Akaike information criterion
SC: Schwarz information criterion
HQ: Hannan-Quinn information criterion

4.5 Johansen Co-integration test

The study rejects the null hypothesis of no cointegration vector since the trace test (Table 5) shows evidence of two cointegrating vectors while the maximum eigenvalue test (Table 6) shows one cointegrating vector. The study follows the maximum eigenvalue test, which means there is one cointegrating vector. The presence of cointegration suggests that there is a long-run relationship between GDP and the other variables.

Table 5: Trace test

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None *	0.559693	119.6358	95.75366	0.0004*
At most 1 *	0.346545	71.23906	69.81889	0.0384*
At most 2	0.333550	46.13568	47.85613	0.0719
At most 3	0.200002	22.19402	29.79707	0.2879
At most 4	0.130858	9.028383	15.49471	0.3628
At most 5	0.012694	0.753739	3.841466	0.3853

Trace test indicates 2 cointegrating eqn(s) at the 0.05 level
* denotes rejection of the hypothesis at the 0.05 level
**MacKinnon-Haug-Michelis (1999) p-values

Table 6: Maximum Eigen value test

Hypothesized No. of CE(s)	Eigenvalue	Max-Eigen Statistic	0.05 Critical Value	Prob.**
None *	0.559693	48.39671	40.07757	0.0046*
At most 1	0.346545	25.10338	33.87687	0.3781
At most 2	0.333550	23.94165	27.58434	0.1368
At most 3	0.200002	13.16564	21.13162	0.4371
At most 4	0.130858	8.274644	14.26460	0.3515
At most 5	0.012694	0.753739	3.841466	0.3853

Max-eigenvalue test indicates 1 cointegrating eqn(s) at the 0.05 level
* denotes rejection of the hypothesis at the 0.05 level
**MacKinnon-Haug-Michelis (1999) p-values

4.6 Vector Error Correction Model

According to the results of section 4.5, it is demonstrating that all the series are cointegrated with one cointegrating equation. Consequently, the unrestricted vector autocorrelation model is not appropriate. Therefore, the vector error correction (VECM) model deals with AIC using lag length one was applied for the analysis. The size and outcome of the cointegrating equation coefficients govern the reaction of each variable in the model (Table 8) to deviations from the long-run relationship.

Co-integrating equation from Table 7;

$$ect_{t-1} = lgdp_{t-1} - 0.64\, lgc_{t-1} + 0.14\, li_{t-1} + 0.59\, lm_{t-1} - 1.15\, lhc_{t-1} - 0.13\, lx_{t-1} + 1.45$$

The relationship of GDP and other variables can be evaluated from the following equation;

$$LGDP = 0.63831\ LGC - 0.143249\ LI - 0.591179\ LM + 1.151853\ LHC + 0.133924\ LX$$

The above equation shows that investment and import negatively affect economic growth. Moreover, government consumption, private consumption, and export have a positive relationship with economic growth. The outcome in line

with the study conducted in Bangladesh. (Islam and Hossain 2015) The absolute t-statistic for the independent variables are greater than two, indicating that those variables are significant except export. The positive and statistically significant relationship between LGC and LGDP with a coefficient of 0.64 indicates that a 10% increase in government consumption expenditure leads to a 6.4 percent increase in economic growth. Similarly, economic growth is likely to rise by 11.5 percent with a 10 percent rise in household consumption. This finding is consistent with the study (Aslam 2017), who indicated a positive influence of household consumption on economic growth. However, investment and imports have a negative impact on economic growth.

Therefore, only domestic demand except investment has a positive impact on economic growth. In general, active and persistent economic growth entails growth in domestic demand. This result is reliable with studies conducted in North Sumatra (Tampubolon and Loh 2020), Ethiopia (Jarra 2013), and Russia (Kirshin et, al., 2014).

Table 7: Cointegration model estimates

Variable	Coefficient	Standard Error	t-statistics
LGDP(-1)	1.000000	-	-
LGC(-1)	-0.638310	0.07086	-9.00754
LI(-1)	0.143249	0.06346	2.25720
LM(-1)	0.591179	0.09628	6.13989
LHC(-1)	-1.151853	0.13234	-8.70401
LX(-1)	-0.133924	0.10981	-1.21964
C	1.454359	-	-

Table 8: Vector error correction model estimates

Error Correction:	D(LGDP)	D(LGC)	D(LI)	D(LM)	D(LHC)	D(LX)
CointEq1	-0.033110	0.428402	-0.365151	-0.027605	0.305217	0.213705
	(0.03767)	(0.14560)	(0.16894)	(0.16951)	(0.09634)	(0.12310)
	[-0.87900]	[2.94228]	[-2.16146]	[-0.16286]	[3.16824]	[1.73600]
D(LGDP(-1))	0.319781	1.920303	1.792706	0.791467	0.292991	0.151764
	(0.18779)	(0.72590)	(0.84223)	(0.84507)	(0.48029)	(0.61373)
	[1.70283]	[2.64542]	[2.12852]	[0.93657]	[0.61003]	[0.24728]
D(LGC(-1))	-0.000145	-0.193000	-0.360385	-0.031899	0.091858	0.032079
	(0.03201)	(0.12375)	(0.14358)	(0.14406)	(0.08188)	(0.10462)
	[-0.00453]	[-1.55966]	[-2.51004]	[-0.22143]	[1.12192]	[0.30661]
D(LI(-1))	-0.011014	-0.350541	0.007664	-0.107358	-0.122001	0.010561
	(0.04184)	(0.16175)	(0.18767)	(0.18830)	(0.10702)	(0.13675)
	[-0.26321]	[-2.16724]	[0.04084]	[-0.57015]	[-1.14000]	[0.07723]
D(LM(-1))	0.103836	-0.157082	0.282867	0.096435	0.131949	-0.011123
	(0.05152)	(0.19916)	(0.23108)	(0.23186)	(0.13178)	(0.16839)
	[2.01526]	[-0.78871]	[1.22410]	[0.41592]	[1.00131]	[-0.06606]
D(LHC(-1))	-0.009339	-0.103468	0.175637	0.132586	-0.131803	0.076608
	(0.05534)	(0.21391)	(0.24819)	(0.24902)	(0.14153)	(0.18085)
	[-0.16875]	[-0.48371]	[0.70768]	[0.53242]	[-0.93127]	[0.42359]
D(LX(-1))	-0.121131	-0.131884	-0.233377	-0.037473	-0.261172	-0.290838
	(0.05109)	(0.19750)	(0.22915)	(0.22992)	(0.13067)	(0.16698)
	[-2.37073]	[-0.66777]	[-1.01844]	[-0.16298]	[-1.99865]	[-1.74175]
C	0.013600	-0.002924	-0.008363	0.002252	0.020778	0.014536
	(0.00333)	(0.01286)	(0.01492)	(0.01497)	(0.00851)	(0.01087)
	[4.08843]	[-0.22739]	[-0.56055]	[0.15042]	[2.44220]	[1.33704]

The main focus of this study is GDP. So error correction model for GDP is,

D(LGDP) = C (1) *(LGDP (-1) - 0.638309597614*LGC (-1) + 0.14324874227*LI (-1)
+ 0.591178605347*LM (-1) - 1.15185300844*LHC (-1) - 0.133923748291*LX (-1)
+ 1.45435942811) + C (2) *D (LGDP (-1)) + C (3) *D (LGC (-1)) + C (4) *D (LI (-1))
+ C (5) *D (LM (-1)) + C (6) *D (LHC (-1)) + C (7) *D (LX (-1)) + C (8)

According to the results of Table 9 coefficient of the error correction term is 0.03311, which shows a 3 percent speed of adjustment towards equilibrium. Even though the coefficient sign is negative and the coefficient value is between 0 and -1, the probability value is insignificant. It indicates that the external shocks do not bring the model to equilibrium significantly in the long run. Short run causality result shows that the null hypothesis of no causality from export to GDP is rejected, which means that there is a short run causality relationship from export to economic growth at the 5 percent significant level. This finding is consistent with (Chawala 2019). Similarly, import has a short run causal effect on GDP. This outcome is parallel to the study (Maitra 2020).

Table 9: Error correction model estimates

	Coefficient	**Std. Error**	**t-Statistic**	**Prob.**
ECT(-1)	-0.033110	0.037668	-0.879004	0.3835
D(LGDP(-1))	0.319781	0.187794	1.702831	0.0947
D(LGC(-1))	-0.000145	0.032014	-0.004529	0.9964
D(LI(-1))	-0.011014	0.041844	-0.263212	0.7934
D(LM(-1))	0.103836	0.051525	2.015265	0.0492
D(LHC(-1))	-0.009339	0.055339	-0.168755	0.8667
D(LX(-1))	-0.121131	0.051094	-2.370733	0.0216
C	0.013600	0.003327	4.088428	0.0002

4.7 Diagnostic Test

Diagnostics test results are shows in below

Table *10*. Even though the model is non normally distributed, accepting the null hypothesis that no serial correlation and no heteroscedasticity issue exist. Also, the model is stable (**Error! Reference source not found.**). So, this model is applicable. It confirms that the models have the desired econometric properties.

Table 10: Diagnostics test results

Residual diagnostics	**Serial Correlation**	**Normality**	**Heteroscedasticity**
Probability value	0.2623	0.0024	0.1556

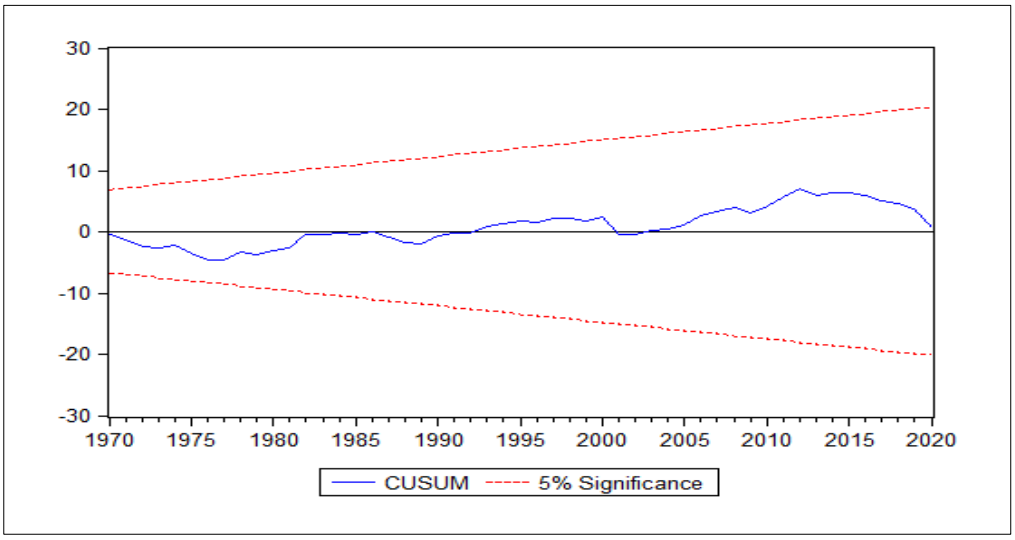

Figure 2: CUSUM test

4.8 Granger Causality

Table 11 shows the direction of causation across variables in the short run. When considering the GDP, government consumption, investment, and private consumption do not have any short-run causal effect on GDP. The above results illustrate an opposite of some empirical literature findings, (Bakari 2017; Keho 2018). In contrast imports and exports cause GDP, similar to the study conducted in South Africa (Chawala 2019) and Brazil (Bakari 2017). Besides, GDP does cause both government consumption and investment. It shows a unidirectional causality between government consumption with GDP and investment with GDP. Import and export show a bidirectional causality, which means import causes export and vice versa. In a short-run relationship, no variable does have any short-run causal effect on private consumption except export. However, private consumption does not cause export, which shows a unidirectional causality between private consumption and export.

Table 11: Granger Causality test results

Null Hypothesis:	Chi-sq	Prob.	Rejection Criteria	Causality
D(LGC) does not Granger Cause D(LGDP)	2.05E-05	0.9964	Don't reject H0	Unidirectional
D(LGDP) does not Granger Cause D(LGC)	6.998244	0.0082*	Reject H0	
D(LI) does not Granger Cause D(LGDP)	0.069281	0.7924	Don't reject H0	Unidirectional
D(LGDP) does not Granger Cause D(LI)	4.530577	0.0333*	Reject H0	
D(LM) does not Granger Cause D(LGDP)	4.061293	0.0439*	Reject H0	Unidirectional
D(LGDP) does not Granger Cause D(LM)	0.877167	0.3490	Don't reject H0	
D(LX) does not Granger Cause D(LGDP)	5.620376	0.0178*	Reject H0	Unidirectional
D(LGDP) does not Granger Cause D(LX)	0.061149	0.8047	Don't reject H0	
D(LRI) does not Granger Cause D(LRGC)	4.696939	0.0302*	Reject H0	Bidirectional
D(LRGC) does not Granger Cause D(LRI)	6.300321	0.0121*	Reject H0	
D(LX) does not Granger Cause D(LHC)	3.994599	0.0456*	Reject H0	Unidirectional
D(LHC) does not Granger Cause D(LX)	0.179431	0.6719	Don't reject H0	

* Denotes rejection of the hypothesis at the 0.05 level

5 Conclusion

The purpose of this study was to demonstrate the association between external demand, domestic demand and the economic growth of Sri Lanka. The study examined the long-run and short-run impact of import, export, government consumption, household consumption, and investment on GDP from 1960 to 2020, including data from the Covid-19 epidemic. The ADF unit root test, Optimal lag length criterion, Johansen cointegration approach, Vector Error correction model, Granger Causality test, and Model adequacy technique procedures were used in this study.

The ADF unit root test results indicate that the time series data are not stationary at levels, but they become stationary after being transformed into the first difference. Lag 1 provides the minimum values for the SC and HQ criteria. Thus, lag one is chosen as the optimal lag length. The Johansen Cointegration Analysis indicates that one cointegration equation arises, proving the existence of a long-run connection. Vector Error Correction Technique proposes that in the long run, only domestic demand, except for investment, positively impacts economic growth while imports of goods and services negatively impact economic growth. However, in the short run, just external demand causally affects economic growth, and this is also affirmed by the granger causality test, presenting that there is unidirectional causality from both import and export to GDP.

Furthermore, the granger causality test findings confirm unidirectional causation that flows from economic growth to both government consumption and investment. This method also demonstrates unidirectional causation from export to household consumption and bidirectional causality between investment and government consumption. The outcomes of model adequacy illustrate that, even though the residuals are not normally distributed, the model is stable, and there is no serial correlation and no heteroscedasticity within residuals, verifying that the model is appropriate. The empirical research findings provide a few recommendations for the Sri Lankan government and policymakers on the consequences of lowering imports of goods and services in the current state of the Sri Lankan economy since a rise in imports of goods and services has a negative effect on GDP. Thus, better management of domestic and external demand will lead to strong economic growth.

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