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Factors Affecting Export Performance of Sri Lanka

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Abstract

Exports are considered as one of the most important element for country's economic growth and import substitution. But the exports of Sri Lanka has been seriously decreased from 4.1% to 1.44% during 2018 to 2019. Therefore the present study aims to investigate the relationship between export performance and its determinants in case of Sri Lanka using annual data over the period of 1987 to 2018. The findings based on Johansen maximum likelihood approach reveal that real effective exchange rate has negative and significant association with export performance which means appreciation of real exchange rate decrease the export performance in the long run. While remittances, imports, industrial value added and government military spending enhance export performance. The short run findings through Vector Error Correction method reveal that the industrial development and government military expenditures adversely affect the export performance. The policy implications of this study require focused effort on the part of management to regulate real exchange rate fluctuations not only to nurture the export performance but to maintain volume of imports and remittances as well. For this, the adoption of curative macroeconomic policies are suggested to attain market consistent real exchange rate which would ensure the access of Sri Lankan products to high income markets and improvement in quality of products due to international competitiveness.

Key Words: *Imports, Industrial Development, Military Spending, Real Effective Exchange Rate, Johansen Co-integration.*

Introduction

In the present era of economic, social and political liberalization, no economy can survive without being part of its process. All nations are now so interlinked with each other that there is no question of isolation. This intermingling not only helps the nations to achieve economic development but also facilitate them for improving their internal and external factors responsible for export performance (Bhavan, 2016). Many developed nations like China in this region has dominated the world markets through boosting its export industry (World Bank, 2019). Thus it is proven that exports can track the way to economic growth (Agosin, 2007). In this regard, real effective exchange rate (REER) is considered one of the most important determinant of export performance (Hassan et al., 2016). The impact of REER is still ambiguous in the

literature as it can affect the exports positively or negatively depending country specific factors. The rise in REER means appreciation of domestic currency which is normally considered to reduce the local markets competitiveness and exports by making them expensive internationally. On the contrary, decrease in REER indicates real depreciation of domestic currency which makes export's prices cheaper in international markets and enhances export performance and economic growth as well (Johnson et al., 2007). Although the export expansion due to depreciated exchange rate is proved valid only in case of economies with lower growth rate while an insignificant impact of depreciated real exchange rate on exports is also empirically evident in the long run (Rodrik, 2009). In the same manner, Eichengreen and Gupta, (2013) explained that exports can be triggered through depreciated exchange rate for shorter period because it cannot be maintained for long time.

"It is often argued that inward remittances are the biggest external source of financial aid coming into developing countries compared to FDI and foreign aid" (Shamim et al., 2015). But the critics of this argument are of the view that remittances give boost to consumption rather than productive capacity of the recipient country. However the positive or negative effect of remittances on export performance depend on the country's policy regarding dissemination and channelization of remittances. The previous studies enlightened the imports as a significant and positive contributor towards export performance particularly in case of a country with limited resources. High dependence on imported raw materials and semi-finished goods increase productivity and efficiency of local industries (Miroudot et al., 2009; Navas et al., 2013; Halpern et al., 2015). Sri Lanka consumed 1.89% of GDP on military spending in 2018 due to civil war threats. Wijeweera and Webb, (2009) found smaller but positive impact of military spending on economic growth of Sri Lanka which highlighted the importance of peace for the country. Jehangir et al., (2020) found the negative impact of military expenditures on growth. Thus the impact of military spending also varies country to country depending on their geography, trade and external policies.

Sri Lanka is an upper middle-income country located in South Asia with gross domestic product and per capita income of $88.7 billion and $4,100 respectively in 2018. Sri Lankan economy is based on agriculture mostly but the government adopted industrialization policy to promote export oriented industry in the early 80s. So it is a transitioning economy from rural to urban set up with emerging manufacturing and services sectors. Sri Lanka's major exports include apparel, rubber products, diamonds, textile, spices and tea. However it has been facing persistent trade deficit for the past several years. For example, its total exports were 33.3% of GDP before 2010, but fell at 16.8% in 2012. In 2018, the real exports volume is reported as 11.87 billion dollars while the imports are 18.70 billion dollars. This situation is getting intricate due to lack of foreign exchange which not only restrict the import capacity of the country but also affect exports by coercing industrial development. Ultimately, this would cause a low production of consumer goods for exports (Marandu, 2008).

Although Sri Lankan government has been taken serious measures to increase exports, but efforts are not fully succeeded yet. That's why, analysis over the determinants of export performance is required. Due to limitations of availability of data for all variables and methodological/theoretical reasons, it is not possible to consider all determinants. However, in the light of existing literature, some factors such as real effective exchange rate, remittances, imports, industrial development and military spending are considered by current study to scrutinize their impact on export performance of Sri Lanka. Besides the government's efforts to increase the country's foreign exchange reserves by following strict policy measures, the resultant inadequate trade performance motivates the researchers for specific case study to identify factors responsible for low exports. It will enable the policy makers to improve the performance of targeted areas through effective monetary and fiscal tools to enhance export performance and economic growth as well.

Research Questions

This study is designed to empirically find the answers of following research questions:

(1) What are the short run and long run dynamics among export performance and macroeconomic factors of Sri Lanka?
(2) How real effective exchange rate enhance export performance?
(3) What can be done to improve exports performance in the middle income countries like Sri Lanka?

Literature Review

A plethora of studies have been conducted to review the vital determinants of exports and their effects on export performance of developed and developing countries. So the literature can be grouped into three categories, one who considered the impact of external determinants on exports performance and the second who considered internal determinants to see their effect on exports. While the third group comprises of studies which consider both the internal and external elements to inspect their impact on export performance. The present study relates to third group so that the dynamic determinants of exports could be highlighted and suitable policy implications could be suggested for policy makers.

The impact of real effective exchange rate (REER) is very vague in past literature so it always remains an interesting and important debatable determinant of export performance. Anagaw and Demissie, (2012) explored the positive and significant impact of REER on exports of Ethiopia by using Johansen multivariate approach during 1970-2010. Biggs, (2007) recommended that REER can affect the exports either positively or negatively. When REER appreciated in some low income countries, it increased exports in few countries while decreased exports in other countries at the same time. Fang and Miller, (2004) revealed that currency depreciation (increase in REER) does not increase the exports. Mohammad et al., (2009) explained the effect of REER on exports of Indonesia, Thailand, Malaysia and Singapore along with other variables. They found that appreciated real effective exchange rate had a significant negative impact on exports of these countries. Obeysekera and Ekanayake, (2016) found that the impact of REER remained insignificant on exports of Sri Lanka during long term over the period 2001 to 2016 while REER affected the export performance positively and significantly in the short run.

Fiscal expenditures are found to posit two fold impact on economic growth of a country so it is an important element to determine export performance. Zaheer et al., (2017) examined the impact of military spending on economic growth of Sri Lanka, Bangladesh, Pakistan and India for the time span of 1985 to 2015. Their findings reveal that military spending positively affect the growth of Sri Lanka and Bangladesh while it negatively affects the growth of Pakistan and India. Rahman and Siddiqui, (2019) also stated that military expenditures affects the export performance through economic growth channel. By applying generalized method of moments for eighty five countries over the period of 1998-2017, they concluded that on one side military expenditures negatively affect the GDP by leaving less budget for development projects but on other side it positively impacts the economy by raising the exports of arms and ammunition. Girma, (2019) explained the presence of positive relationship between government spending and export performance for the firms in China. The study showed that government expenditures in the form of production subsidies really boost the level of exports. In order to investigate the impact of military spending on Pakistan's economy, Jehangir et al., (2020) applied Autoregressive distributed lag method on time series data over the time of 1974-2018. They stated that military spending affected the economic growth positively during short run and negatively during long run.

The review of previous studies prove imports and remittances responsible for affecting the exports of countries. Marwan et al., (2013) investigated the impact of exports, foreign aid and remittances on GDP utilizing annual data over 1977 to 2010 for Sudan. They applied Johansen co-integration technique and found positive and significant long run relationship of exports and remittances with GDP. Velnampy and Achchuthan, (2014) also found positive and significant relationship between imports and exports by utilizing annual data for the time period 1970 to 2010 in case of Sri Lanka. Imports and exports have not only strong linkage with each other but also affect the economic growth significantly. Likewise Bhavan (2016) examined positive impact of imports and FDI on exports of Sri Lanka in the long run employing Johansen multivariate co-integration method on annual data over 1980 to 2013. Hien, (2017) explored that trade deficit in Malaysia improves significantly by increase in inward remittances during 1990 to 2015. Inward remittances depreciate the exchange rate thus assert the imports to reduce and exports to increase. On the contrary, Nguyen (2017) found that remittances inflow appreciate the exchange rate in developing countries and affect the export performance negatively.

The industrial development in most of the cases contributed positively for import performance. Embuldeniya, (2015) explored the positive and significant impact of apparel industry value added on exports of Sri Lankan economy. Uysal and Mohamoud, (2018) also found positive influence of industrial value addition on export performance of seven East African countries for the period of 1990-2014. In addition, Westphal, (1990) highlighted the contribution of appropriate industrial policies for international competitiveness of South Korean exports. He concluded that developing and lower income economies first focus labor intensive industries with comparative advantage to boost their export performance. Thus industrial value added is a strong determinant of export performance.

The existing literature motivates to design a research with the objective to empirically explore the exigent determinants of export performance in Sri Lanka. Although export performance has grasped the major attention of researchers since long time but it is still required more work for understanding. The disagreement is based on adoption of harmonizing reforms, pro-trade development stage, classification and degree of liberalization. The past studies indicate that a country has to ensure adoption of appropriate policies to improve its export performance. Many researchers contributed to reinvestigate the association of export performance and its determinants by considering supply side, demand side or both factors in case of time series, panel or comparative regression analysis. But the findings of these studies vary and could not be generalized due to country's specific factors. The present study aims to bridge up the gap in existing literature through analyzing the short run and long run relationship between export performance and its determinants specifically in Sri Lanka.

Materials and Methods

The present study uses annual time series data over the time span of 1987 to 2018 for Sri Lanka. The data for the selected variables including exports, remittances, imports, industrial development and military spending has been extracted from World Development Indicators of World Bank (2019). The data for REER has been sourced from Darvas, (2012).

Model

This study uses the following log-log model.

$$lnEXP_t = a_0 + a_1 lnREER_t + a_2 lnREM_t + a_3 lnIMP_t + a_4 lnIND_t + a_5 lnGME_t + \varepsilon_t \quad (1)$$

Here t depicts the time period while all the variables are defined and described in Table 1. The rationale behind using the log-log model is the ease of interpreting and comparing estimation output. Many studies established that the outcomes of log transformed models are more reliable as compare to simple models (Cameron, 1994; Hassan et al., 2017).

Table 1: Variables Description

Variable	Variable Representation	Variable Proxy	Transformation of the Variable	Data Source
Export Performance	$\ln EXP_t$	Exports of goods and services as % of GDP	ln(Exports/GDP)	WDI; The World Bank, 2020
Exchange Rate	$\ln REER_t$	Real Effective Exchange Rate Index	ln(Real Effective Exchange Rate)	Darvas (2012)
Remittances	$\ln REM_t$	Remittances inward as % of GDP	ln(Remittances/GDP)	WDI; The World Bank, 2020
Imports	$\ln IMP_t$	Imports as % of GDP	ln(Imports/GDP)	WDI; The World Bank, 2020
Industrial Development	$\ln IND_t$	Industry value added as % of GDP	ln(Industry value added/GDP)	WDI; The World Bank, 2020
Government Spending	$\ln GME_t$	Government military expenditures as % of GDP	ln(Government military expenditures/GDP)	WDI; The World Bank, 2020

On the basis of existing literature, the expected sign of a_1 can be positive or negative depending on impact of depreciation or appreciation of REER in presence of fixed or floating regime. The REER is obtained by dividing the nominal exchange rate to price deflator. It is the measure of domestic currency exchange against the weighted average of the foreign currencies of trading partners. Increase in value of index shows the appreciation of domestic currency while the decrease in value of index depicts depreciation of domestic currency against the weighted average of foreign currencies of trading partners. The sign of a_2 is expected to be positive in most cases but it can be negative depending on country's specific condition because remittances can increase imports or exports or both at the same time. The sign expectation of a_3 and a_4 is positive as imports and industrial development are source of improving exports. However the sign of a_5 can be positive or negative as military spending has country specific impact which can increase or decrease the export performance. In many developing countries like Pakistan, military is involved in many economic activities like health, education, infrastructure and shopping malls and positively affect the exports.

Estimation Methodology

Firstly, the annual data will be identified for unit root problem. For this, Augmented Dickey and Fuller, (1981) unit root test will be applied. After identifying unit root problem, Johansen multivariate co-integration technique will be applied to test the long run relationship between export performance and all explanatory variables. And if dependent and independent variables are found co-integrated, the study will

use the same approach to find the impact of real effective exchange rate, remittances, imports, industrial development and military expenditure on export performance in the long run as well as in short run. Then various diagnostic tests will be applied to check the stability of the outcomes. The step wise detailed methodology is as under.

Augmented Dickey Fuller Unit Root Test (ADF)

Dickey and Fuller presented their first DF unit root test in 1979 and then modified it in 1981 by including lagged term of the first differenced dependent variable as independent variable which is known as ADF unit root test. After modification, it is presented as:

$$\Delta M_{t-1} = \alpha + \beta M_{t-1} - \sum_{n=1}^{p} \gamma_n \Delta M_{t-n} + \varepsilon_t \qquad (2)$$

ΔM_{t-n} is the new term which was included in the previous DF test. The slope of β will decide about the variable is stationary at level or first differenced. Now the procedure of Johansen multivariate co-integration technique will be described.

Johansen Multivariate Co-Integration Technique

Once the stationary properties of all analyzed variables are checked, next step will be the application of Johansen multivariate co-integration technique. This approach was proposed by Johansen, (1988) and Johansen and Juselius, (1990), and it is also recognized as Johansen maximum likelihood approach. This approach is applicable if all variables are stationary at first differenced. It is better than Engle and Granger approach in case of multivariate analysis. Johansen multivariate method is capable of detecting multiple co-integrating vectors. It escapes issues created when errors are carried from one step to the next as well as selection of dependent variable. The statistics of Trace test and maximum Eigenvalue test are obtained by this approach and then decision will be made on the basis of comparison between estimated and critical values of both tests. The greater estimated value than its corresponding critical value will confirm the existence of co-integration between dependent and independent variables, otherwise vice versa. Trace and maximum Eigen value tests equations can be written as:

$$\lambda_{trace} = -T \sum_{n=r+1}^{p} \ln(1 - \hat{\lambda}_i) \qquad (3)$$

$$\lambda_{max} = -T ln(1 - \hat{\lambda}_{r+1}) \qquad (4)$$

Here, λ_i presents Eigenvalues, T stands for total number of observations and r+1 denotes alternate hypothesis against null hypothesis of r co-integrating vectors. After confirming the co-integration between the dependent and independent variables, the long run (normalized) and short run (adjusted) coefficients will be estimated through the Johansen multivariate co-integration method by using following matrix:

$$\pi = \alpha\beta \qquad (5)$$

Here, π represents the matrix which is obtained by multiplying matrices α and β. The short run coefficients will be provided by α whereas β provides the normalized long run coefficients.

Results and Discussion

In this section, the empirical findings and their discussion will be presented. First of all, Table 2 presents the summary of descriptive statistics for each selected variable.

Table 2: Descriptive Statistics

Variable	LEXP	LREER	LREM	LIMP	LIND	LGME
Mean	3.059	4.570	1.938	3.617	3.322	1.126
Std. Dev.	0.133	0.125	0.184	0.179	0.048	0.311
Skewness	-0.266	0.115	-0.502	-0.494	0.537	0.275
Kurtosis	1.670	1.810	2.038	1.892	2.294	2.277
Jarque-Bera	2.732	1.957	2.580	2.939	2.205	1.099
Probability	0.254	0.375	0.275	0.229	0.332	0.577

The empirical findings showed in Table 2 reveal that probability of natural log of exports, REER, remittances, imports, industrial development and government military spending found to be insignificant which concludes that data of all analyzed variables is following normal distribution. After presenting summary statistics, Table 3 displays the estimations regarding matrix of variance inflation factor (VIF).

Table 3: Variance Inflation Factor

Variable	LEXP	LREER	LREM	LIMP	LIND	LGME
LEXP	1	-	-	-	-	-
LREER	1.288	1	-	-	-	-
LREM	1.024	3.389	1	-	-	-
LIMP	4.036	2.091	1.272	1	-	-
LIND	1.010	1.236	1.613	1.040	1	-
LGME	1.807	1.115	1.069	1.883	1.047	1

The results show the level of VIF between all the analyzed variables, for instance: VIF (LREER, LREM) =3.389 and VIF (LREM, LIMP) = 1.272 and all is less than 10 by using the formula [1 / (1 – r squared)]. It concludes that all independent variables are free from multi-collinearity issue. As the explanatory variables are not multi-collinear with each other, the next step is to check the stationarity of the variables so that it could be known whether to apply co-integration approach or otherwise. The results of ADF unit root test are reported in Table 4. All the variables are tested for the null hypotheses of "data series is non stationary" and vice versa. It concludes that the null hypothesis of non stationarity cannot be rejected at level and all the variables are found stationary at first differenced. It means that all variables have one and same order of integration.

Now it is possible to apply Johansen co-integration approach. The empirical outcomes of Johansen's co-integration test are presented in Table 5. The trace test and maximum Eigen value test report that long-run co-integration exists between dependent and independent variables. The null hypothesis of test is "zero co-integrating vectors" while alternate hypothesis is "co-integration vector exists". The findings show that both tests confirm one co-integration equation at 5 percent level of significance and alternate hypothesis is accepted. The calculated values of trace and maximum eigenvalue tests are {114.862> 95.753}, {47.476 > 40.077} respectively and these are greater than their corresponding critical values at 0.05 percent.

Table 4: Unit Root Test

ADF Test					
Variable	**At Level**		**Variable**	**At First Difference**	
	Constant	Constant & Trend		Constant	Constant & Trend
$LEXP_t$	-0.916	-1.835	$LEXP_t$	-5.847*	-6.675*
	(0.769)	(0.663)		(0.000)	(0.000)
$LREER_t$	-0.716	-3.390	$LREER_t$	-5.371*	-5.157*
	(0.828)	(0.071)		(0.000)	(0.000)
$LREM_t$	-1.416	-1.701	$LREM_t$	-5.954*	-6.108*
	(0.561)	(0.726)		(0.000)	(0.000)
$LIMP_t$	-1.153	-2.393	$LIMP_t$	-5.352*	-5.642*
	(0.681)	(0.375)		(0.000)	(0.000)
$LIND_t$	-1.937	-2.168	$LIND_t$	-5.763*	-5.696*
	(0.311)	(0.489)		(0.000)	(0.000)
$LGME_t$	-1.303	-1.660	$LGME_t$	-4.744*	-4.906*
	(0.615)	(0.744)		(0.000)	(0.002)

Note: (*) indicates at 1% significance level. Probabilities are shown in ().
Source: Estimated by the authors.

So it is concluded that there exist long run relationship between export performance and real effective exchange rate, remittances, imports, industrial development, government military spending in Sri Lanka.

Table 5: Johansen co-integration approach (Trace Test)

Null Hypothesis	Alternate Hypothesis	Test Statistic	Critical Value (At 5%)
r= 0 *	r>1	114.862	95.753
r ≤ 1	r>2	67.386	69.818
r ≤ 2	r>3	37.841	47.856
r ≤ 3	r>4	17.326	29.797
r ≤ 4	r>5	10.897	15.494
r ≤ 5 *	r>6	4.956	3.841
Maximum Eigenvalue Test			
Null Hypothesis	Alternate Hypothesis	Test Statistic	Critical Value (At 5%)
r=0 *	r=1	47.476	40.077
r=1	r=2	29.544	33.876
r=2	r=3	20.515	27.584
r=3	r=4	6.429	21.131
r=4	r=5	5.940	14.264
r=5	r=6	4.956	3.841

Source: Author's calculations.
Note: (*) denotes rejection of the null hypothesis at the 5% significance level. 'r' indicates number of co-integrating vectors.

Here, the next step is to estimate the lag length criterion. The appropriate lag length criteria is reported in Table 6. It is shown that the appropriate lag length is 1 according to all five criteria.

Table 6: Lag Length Criterion

Lag	LogL	LR	FPE	AIC	SC	HQ
0	186.105	NA	2.46e-13	-12.007	-11.726	-11.917
1	320.627	206.267*	3.64e-16*	-18.575*	-16.613*	-17.947*
2	356.132	40.239	5.15e-16	-18.542	-14.899	-17.376

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

The normalized long run coefficients showed in Table 6 state significant relationship between dependent and independent variables. The coefficient of REER is found negative and significant, which shows that 1 percent increase in REER (appreciation) significantly decreases exports by 0.622 percent in the long run, on average if other factors remain unchanged in Sri Lanka. This result is compatible with (Telak and Yeok, 1998; Fang and Miller, 2005; Mehare and Edris, 2012; Panda and Mohanty, 2015; Obeysekera and Ekanayake, 2016; Hassan et al., 2016). It is empirically evident in case of developing countries like Sri Lanka that due to appreciation of exchange rate, exports become expensive internationally and lost competitiveness. In addition, most of developing countries face the issue of exchange rate risk due to frequent financial fluctuations which leads to undermine export competitiveness significantly. Table 6 displays that the coefficient of remittances is appeared as positive and significant which reveals that 1 percent increase in remittances raises exports by 0.325 percent in the long run if all else remain fixed. It is in line with finding of (Bugamelli and Paterno, 2011; Hien, 2017). Remittances prove useful for the recipient country in a way that it reduces the internal and external borrowing and is capable of reducing exchange rate fluctuations. It enhances the level of entrepreneurship by raising level of foreign reserves and reducing current account deficit.

The imports are having significant impact on exports and 0.634 percent exports are increased due to 1 percent increase in imports. This result is similar to (Velnampy and Achchuthan, 2014; Bhavan, 2016). The imports and exports are linked with each other through channel of economic growth. For sustainable growth process, imports and exports are inevitable as both cause each other significantly. The coefficient of industry value added is positively linked with export performance and 1 percent increase in industry value added significantly increases the exports by 0.881 percent in the long run. It is same as (Westphal, 1990; Embuldenia, 2015; Uysal and Mohamoud, 2018). Sri Lanka's mining, manufacturing and construction industries are contributing a lot towards its export performance. The findings also disclose that 1 percent increase in government military expenditure raise the export performance by 0.099 percent in the long run if other elements are assumed to be constant. This result is similar to (Pacific, Shan & Ramadhan, 2017). Military expenditures pay back positively for the development of a country due to its active participation in health, education, construction and other service sectors of the country.

After interpreting the long-run normalized coefficients, the short run (adjusted) coefficients based on vector error correction model (VECM) are presented in Table 8. The empirical findings show that real exchange rate has negative but remittances and imports have positive relationship with exports in the short run but this linkage is insignificant. It depicts export performance of Sri Lanka is not influenced by real effective exchange rate, remittances and imports in the short run.

Table 7: Long Run (Normalized) Coefficients

Dependent Variable: $LEXP_t$				
Independent Variable	Coefficient	Standard Error	t- stat	Decision
$LREER_t$	-0.622	0.143	-4.346	significant
$LREM_t$	0.325	0.063	5.117	significant
$LIMP_t$	0.634	0.098	6.449	significant
$LIND_t$	0.881	0.156	5.646	significant
$LGME_t$	0.099	0.037	2.668	significant
C	0.060	-	-	-

Source: Calculated by the authors.

The coefficients of industry value added and military expenditure are found to be negatively associated with export performance and both are statistically significant. The negative and significant coefficient of error correction term (ECT_{t-1}) validates the existence of co-integration between the underlying variables. The coefficient of ECT_{t-1} is found to be −0.714, which describes that the disequilibrium happened due to any macroeconomic disturbance during short run will be corrected 71.4 % each year and converge towards equilibrium after 1.40 years approximately.

Table 8: Adjusted Short Run Coefficients based On VECM Approach

Dependent Variable: $DlnEXP_t$

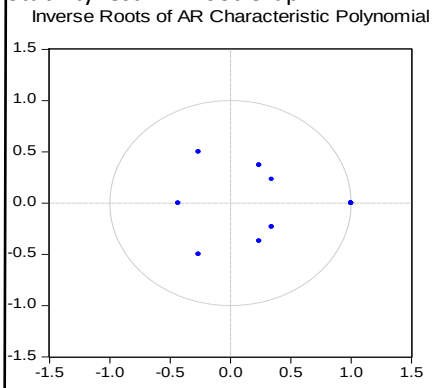
Independent Variable	Coefficient	Standard Error	t-stat	Decision
$DLREER_t$	-0.081	0.281	-0.290	insignificant
$DLREM_t$	0.283	0.192	1.474	insignificant
$DLIMP_t$	0.106	0.157	0.675	insignificant
$DLIND_t$	-1.403	0.392	-3.581	significant
$DLGME_t$	-0.157	0.059	-2.643	significant
ECT_{t-1}	-0.714	0.224	-3.178	significant

After having discussion on VECM results, this study applied the diagnostic tests including Jarque Bera test, Lagrange multiplier test, heteroscedasticity and stability test to verify the accuracy of the results which are reported in Table 8. The outcomes show that p- values of all diagnostic tests are insignificant (greater than 0.05). It means that the null hypothesis of these tests cannot be rejected and concludes that error term is following normal distribution and the model is free from the issue of serial correlation and non-constancy of variance. Lastly, the stability of the overall model is verified by using AR-root graph shown in the same table which concludes that estimated model is stable without any structural break during 1987 to 2018.

Table 9: Diagnostic Test

VEC Residual Normality Test, Joint Jarque Bera Test	12.984 (0.370)
VEC Residual serial correlation LM Test	27.304 (0.851)
VEC Residual Heteroskedasticity Test (joint chi square test)	281.131 (0.695)

StabilityTest: AR Root Graph



Note: Author's calculations. Probabilities are shown in ().

Conclusion

The study investigated the association of real effective exchange rate, remittances, imports, industrial development and government military spending with export performance in case of Sri Lanka using time series data over the period of 1987 to 2018. The study used Johansen co-integration approach to estimate the long-run relationship between selected variables. The long-run coefficients showed that real effective exchange rate posits negative impact while remittances, imports, industrial development and government military spending cast positive and significant impact on export performance. By employing vector error correction model, the study found the negative and statistically significant impact of industrial development and military spending on export performance in the short run. The role of REER remained negative and insignificant while the impact of remittances and imports remain positive and insignificant on export performance during the short run. The policy implication of the study is that monetary authorities should focus on implementation of moderating policies regarding real exchange rate as devaluation of currency/ depreciated exchange rate are impeding the exports. It is suggested that focused efforts to regulate real exchange rate fluctuations are desired not only to nurture the export performance but to maintain imports and remittances. For doing this, the stable macroeconomic policies are inevitable so that Sri Lanka could access upper income international markets and improve its products quality.

Limitations and Future Prospects

This study obtains efficient results by utilizing latest available data and applying unit root test, co-integration test and ECM but the future research can find more improved results by using more updated figures. This study uses Johansen co-integration approach for analysis, further study can be designed using more advanced econometric methodology. Moreover the association of export performance and its determinants can be examined for future research by conducting comparative or panel study.

Submission Declaration Statement

We hereby confirm that the manuscript has no any actual or potential conflict of interest with any parties, including any financial, personal or other relationships with other people or organizations. We confirm that the paper has not been published previously, it is not under consideration for publication elsewhere, and the manuscript is not being simultaneously submitted elsewhere.

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