Impact of COVID-19 on Exports: Evidence from Sri Lanka

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Abstract

The COVID-19 pandemic has affected every aspect of people's economic life across the globe. Most countries put in place restrictions to prevent the spread of the pandemic. The pandemic brought about financial, technological and policy shocks. This paper aims at assessing the impact of COVID-19 on Sri Lanka's exports. The first part of the paper discusses Sri Lanka's recent export performance while the second section aims at quantifying the impact based on a novel approach proposed in the recent literature. Specifically, this study employs the traditional gravity model framework in quantifying the determinants of Sri Lanka's exports and utilizes the estimated coefficients along with the GDP forecasts in assessing the impact of COVID-19 on exports. It is expected that COVID-19 induced supply and demand shocks are duly absorbed into the GDP forecasts. Our analysis found that the pandemic severely affected Sri Lanka's exports, compared to most of its competitors, largely due to Sri Lanka's heavy concentration on a few 'non-essential' products and a few regions which were gravely exposed to the pandemic. Nevertheless, Sri Lanka's traditional agriculture exports were marginally affected by the pandemic. The determinants of exports clearly indicate that economic performance and trade and investment freedoms in partner countries are crucial to the success of Sri Lanka's exports. When compared to the realized export data for 2020, our assessment did a reasonable approximation on the impact of COVID-19 on exports. The assessment for 2021 suggests that it is highly unlikely that Sri Lanka's total exports reach its pre-pandemic level. Sri Lanka needs to adopt proactive measures in revitalizing the export sector so that Sri Lanka is not at a disadvantage when the global economy emerges from the pandemic in the near future. Nevertheless, it is highly unlikely that the pre-pandemic competitive edge remains intact in the post-pandemic era.

Keywords: COVID-19, exports, gravity model framework, impact analysis, Sri Lanka

Introduction

The objective of this study is to understand the potential impact of the ongoing pandemic (COVID-19) on Sri Lanka's exports. Since January 2020, the world has been suffering from the COVID-19 outbreak, which, as of August 2020, has resulted in over 782,000 deaths and over 22 million confirmed cases worldwide. In order to slow down the spread of the virus, many countries imposed restrictions, including city and nationwide lockdowns. Several countries also restricted the entry of persons from outside the border and have also placed restrictions/conditions on people engaging in travel outside the country.

An outbreak of a novel Coronavirus was reported from Wuhan, China, in December 2019, causing numerous deaths and complications such as pneumonia and acute respiratory distress syndrome. The infection rapidly spread to all parts of the globe and was declared a pandemic on 11th March 2020 by the World Health Organization. Sri Lanka reported the first case of Coronavirus from a Chinese tourist on 27th January 2020 and subsequently, the first Sri Lankan case was reported on 11th March 2020. However, with the COVID-19 outbreak, strict measures were taken to minimize human mobility. A nationwide curfew was imposed from the 20th to 24th March, and it was further extended together with a strict ban on inter-district travel. Three populous as well as industrialized districts; Colombo, Kalutara, and Gampaha were identified as high-risk zones. The main intention of the curfew was to minimize people's contact with infected individuals and thereby to reduce the spread of the epidemic. Entry of the virus to the island was curtailed through the closure of the airport and the ports. Considering the progress of the control measures and the impact of the strict curfew on the country's economy, the government announced, on 19th April 2020, its decision to relax the nationwide curfew and to implement moderated travel restrictions by permitting inter-district travels only to report for work and for the operation of essential service. Further, on 11th May 2020, the government ordered partial opening of offices and businesses and the restrictions were further relaxed with a new set of health guidelines. Almost all control strategies implemented in Sri Lanka were aimed at minimizing human mobility; both the imposition and the relaxation of the curfew could be interpreted as measures to minimize the mobility rates to a certain extent.

Impacts of these restrictions on the world economy were significant. According to the International Monetary Fund's (IMF) World Economic Outlook, June 2020, the global economy is projected to sharply contract by 4.9 per cent in 2020. The Department of Census

and Statistics of Sri Lanka reported that Sri Lanka's economy contracted by 1.6 per cent during the first quarter of 2020 (DCS, 2020). Both the agricultural and industrial sectors contracted by 5.6 per cent and 7.8 per cent respectively, although the services sector expanded by 3.1 per cent. Moreover, it is also expected that the economy may report a much higher negative outlook during the second quarter of the year since the country-wide lockdown and other restrictions were mostly imposed during this period. Hence, the demand and supply shocks may have been reflected on various macro-economic variables.

The objective of this study is two-fold: first it aims at reviewing policy measures introduced by the government in supporting businesses affected by COVID-19, and second, it is expected to shed light on Sri Lanka's export performance during the pandemic. Moreover, it aims at estimating some useful parameters to assess the impact of the pandemic on Sri Lanka's export sector by employing the traditional gravity model framework.

Literature review

The impact of COVID-19 on international trade flows started emerging in recent months and it is quite difficult to draw either theoretical insights or empirical evidence from the past events due to the unique nature of the current pandemic. Hence, this study largely concentrates on literature published recently on the impact of COVID-19 on international trade. Saif et al. (2021) introduced a conceptual model in capturing the impact of COVID-19, arguing that the existing theoretical models in the field of international trade lack the capacity to capture the effect arising from a wide-wide pandemic. The authors emphasized three main channels through which COVID-19 affects the international trade flows in the short and medium-term: namely financial, technological, and policy shocks.

The authors argue that COVID-19 related lockdown measures affect financial positions of firms, households, and the government. In particular, informal, small and medium size businesses in some sectors such as tourism, recreation, and hospitality find it difficult to maintain their financial positions, and as a result, such businesses are forced to close down their business activities either fully or partially. Households often cut down their expenditure due to the decline in wages and/or loss of employment and income earning opportunities, although they might have received a lump-sum payment from the government. Finally, governments find it difficult to maintain fiscal deficits at optimal level since their expenditure overruns the revenue. Governments need to finance COVID-19

preventive measures as well as support businesses and households affected by the pandemic. However, they find it harder to collect sufficient revenue through taxation. Saif et al. (2021) concluded that COVID-19 financial downturn has an adverse effect on export flows.

With respect to technological shocks, Saif et al. (2021) highlighted the pandemic-induced digitalization and utilization of information and communication technology (ICT). Households, firms, and governments utilized ICT in accessing and delivering goods and services during the pandemic1. Large corporates as well as small and medium firms adopted cutting-edge technology in exploiting the opportunities for marketing, branding, and advertising to a wider consumer base. In addition, both the public and private sector adopted new technological innovations to enable their employees to work from home. These and other productivity-enhancing technologies may have a positive impact on exports, in particular, of advanced and emerging economies. Saif et al. (2021) pointed out that the preventive and safety policies, including closures, shutdowns, lockdowns, restriction on movement, import and export bans and social distancing measures caused policy shocks which may immediately affect all economic activities. Moreover, policy changes including some fiscal and monetary policy measures adopted by governments to support businesses and households, could also affect trade flows. According to Saif et al. (2021), it could be expected that COVID-19 related restrictions and policy changes have a negative effect on trade openness that could badly affect exports of developing countries.

Baldwin and Tomiura (2020) argue that the COVID-19 pandemic results in both supply and demand shocks to the world economy. First, restrictions on movements and lockdowns have disrupted the production and distribution related activities, thereby causing supply shocks. In addition, quarantine measures and infections hindered workers' attendance. Regarding demand, restrictions on mobility and closure of businesses prevented households, businesses, and governments from purchasing goods and services. Although governments increased some health and welfare related expenditure, such expenses were much lesser compared to the reduction in private aggregated demand. Hence, Baldwin and Tomiura (2020) argue that both supply and demand shocks affect trade flows negatively. The authors

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1 The strict confinement and distancing measures forced households, firms, and government to carry out most activities online, including shopping, communication, entertainment, public administration, schooling, and conferencing.

also argue that the size of the impact could be somewhat larger compared to any of the previous pandemics due to several reasons. First, the COVID-19 pandemic has affected major economies, whereas most previous pandemics, witnessed after the Second World War, largely affected economically disadvantages countries. Second, the pandemic has resulted in disruptions to supply networks around the world. More importantly, the pandemic has affected demand as well, with the reduction of aggregate demand for products and services in households, businesses, and the government. These supply and demand shocks inevitably lead to a slowdown in international trade flows. Thus, Baldwin and Tomiura (2020) have proposed to employ a gravity model based on an analytical framework to capture the impact of COVID-19.

In the traditional gravity model framework, the GDP of partner countries and of the reporting country is entered into the regression model as independent variables. Through this tool, it is possible to capture the supply shock effect using the reporting country's GDP, while the demand shock related effect can be captured via the GDP of the partner countries. Using the gravity model framework, Kazunobu and Hiroshi (2020) examined the impact of COVID-19 on exports of 26 countries across two time-periods: January-March 2019 and January-March 2020. The authors introduced COVID-19 cases and deaths of the reporting country and partner countries into the regression model to capture the impact of COVID-19 on export flows. It was designed so, since quarterly GDP figures were not released at the time the study was undertaken. Among other things, the authors found that COVID-19 has negatively affected exports of developing countries. The negative effects are particularly prevalent in the textile, footwear, and plastic industries. The authors have also observed that the COVID-19 burden on the exporters' neighboring countries has a positive effect on exports, indicating a substitution effect in exporting. In contrast, with respect to agriculture commodities, the authors found a positive effect of the importers' COVID-19 burden on trade. This indicates that the importers' COVID-19 burden promotes exports of essential goods to affected countries. Similarly, United Nations Conference on Trade and Development (2020) also found that exports from developing countries declined due to the pandemic.

Methodology and data collection
The COIVD-19 induced public policy measures will be assessed in identifying their possible influence on Sri Lanka's exports. In addition to reviewing the changes into internal policy

environment, an attempt will be made to analyze policy changes made by major trading partners. A comparative analysis on Sri Lanka's export performance during the COVID-19 pandemic will be carried out and some of its competitors' and South Asian neighbors' export performance will be considered for the analysis. Finally, a gravity model framework will be employed in estimating some of the key determinants of selected export categories, namely tea, fish and related products, textiles and apparel, electronic and related goods, spices, and rubber and related products. The estimated coefficients will be utilized in assessing the possible effect of COVID-19 on Sri Lanka's exports for the 2020-2021 period. Based on Baldwin and Tomiura (2020), this paper employs a variant of the gravity model to examine the determinants of exports.

$$y_{ijt} = \beta_0 + \beta_1 distw_{ij} + \sum_{j=1}^{k} \alpha_j x_{jt} + \sum_{i=1}^{k} \delta_i z_{it} + \sum_{d=1}^{k} \theta_d D_d + u_{ijt} \qquad (1)$$

In equation (1), y stands for the dependent variable, which could be either total exports or one of the export categories. The variable *distw* stands for the weighted distance between Sri Lanka and each trading partner country, while the trading partners' variables are represented by x variables. These may include the partner countries' GDP per capita, population, level of trade freedom, level of investment freedom, and the number of free trade agreements (FTAs) signed2. In the regression equation, GDP per capita, real effective exchange rate, and population in Sri Lanka are represented by z variables, while D stands for dummy variables representing various trading agreements and other status. In particular, dummy variables have been included into the model to represent the South Asia Free Trade Agreement (SAFTA), Indo-Lanka Free Trade Agreement (ISLFTA), and Sri Lanka-Pakistan Free Trade Agreement. In addition, a dummy variable is introduced to represent Sri Lanka's colonial relationship with some trading partners.

The parameters attached to variables are given by β, δ, α, and θ, while u is an identically and independently distributed disturbance term. All variables, except dummy variables, are included in the model in their log form.

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2 Trade and investment freedom indicators were employed to capture the level of economic freedom in partner countries. Economic freedom is one of the key determinants of the international trade flow (Baldwin & Tomura, 2020)

The gravity model is estimated using data for the period of 2012-2019. Several factors affected the selection of this period. First, a lengthy period could pose some challenges in terms of non-stationary data where simple Ordinary Least Square (OLS) method leads to spurious regression. Second, the 2012-2019 period is free from the impact of the 2008-2009 financial crisis as well as the impact of the civil war that ended in 2009. The data for the study was extracted from several sources. Data on Sri Lanka's exports were obtained from the Department of Commerce of Sri Lanka, while variables such as per capita income and population (for partner countries and Sri Lanka) were obtained from the World Development Indicator online database. The variables such as weighted distance, colonial dummy, and other related variables were obtained from CEPII.3 Dummy variables representing FTAs were obtained from the World Bank. Trade freedom and investment freedom data were derived from the Heritage Foundation online database4. All data, apart from the dummy variables, were transformed to a natural logarithm. For the purposes of forecasting, this study extracts data from databases administered by the IMF.

Three scenarios are considered for assessing the impact of the COVID-19 pandemic on Sri Lanka's exports. The scenarios are constructed based on the lower and upper boundaries of the estimated regression coefficients, i.e., 95% confidence interval estimates. In fact, three scenarios provide a range in which the impact (impact of COVID-19 on Sri Lanka's exports) may be felt.

Estimation and discussion

Policy responses

The government and the Central Bank introduced a number of policy measures in countering the negative effects of the COVID-19 pandemic. The policy interventions covered some of the areas such as the monetary sector, financial sector, public expenditure, export & imports, agriculture production, tax revisions, and external financial arrangements. In this paper, our focus is mainly on areas which may directly have influenced Sri Lanka's export performance. The Central Bank of Sri Lanka reduced its policy rates at the beginning of the

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3 See http://www.cepii.fr/cepii/en/bdd_modele/bdd.asp

4 Accessed via https://www.heritage.org/

year and continued to lower it significantly in subsequent months to stimulate private investments5. The private sector firms, largely battered by the COVID-19 related demand and supply shocks and an uncertain future, faced difficulties in financing new investments and working capital requirements at the interest rates that prevailed prior to the pandemic. In addition, the Central Bank of Sri Lanka reduced both Bank Rate and the Statutory Reserve Ratio. All these measures contributed to enhance the liquidity in the market at lower financing costs thereby allowing businesses to access finances for investment and working capital requirements.

Table 1: Selected COVID-19 induced policy responses

Monetary policy	Action
Standing deposit/Lending facility rates	Reduced
Bank rate and statutory reserve ratio	Reduced
Special credit schemes	Introduced
More funds for self-employment promotion	Expanded
More working capital facilities for small & medium firms	Expanded
Concessional loan scheme of LKR 150 billion to assist micro, small & medium, and self-employment	Introduced and expanded
Financial sector	
Extending moratorium period for COVID-19 affected businesses	Introduced and expanded
Setting interest rate upper ceilings	Introduced
Import/Export related measures	
Import restrictions on unessential imports, motor vehicles, luxury goods	Introduced and expanded
Removal of Cess on exports	Introduced
Removal of some taxes on imports (health related goods)	Introduced
Government expenditure	
Expansion of fertilizer subsidies	Introduced
Provision of subsidies for low-income families	A few rounds

Source: Annual report 2020, Central Bank of Sri Lanka

The Central Bank of Sri Lanka also introduced a special credit scheme to help businesses, self-employment, and micro, small and medium enterprises, which were affected by the

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5 In response to the adverse economic situation, the Central Bank of Sri Lanka reduced the Standing Deposit Facility Rate (SDFR) and the Standing Lending Facility Rate (SLFR) by 50 basis points on 30th January 2020. This, and the subsequent revisions in both rates resulted SDFR and SLFR to stand at 4.5 and 5.5 per cent respectively by mid-July 2020.

pandemic related demand and supply shocks. In the financial sector, the government requested financial institutions to grant a debt/interest moratorium for businesses severely affected by the pandemic. The government of Sri Lanka introduced several restrictions on imports. Some imports, in particular motor vehicles and luxury goods, were banned while quantitative restrictions were imposed on some other imported goods and services. Nevertheless, to facilitate the efforts of countering the pandemic, import duties on some imported medical equipment and goods were reduced. Further, the government removed/reduced Cess on some exports to facilitate trade during the pandemic. With respect to public expenditure, the government granted a small cash transfer (LKR 5,000 per poor household) to facilitate consumption expenditure and this cash transfer was implemented a few times during the pandemic. In particular, the government encouraged domestic food production by granting fertilizer subsidies as well as certified prices for 16 selected crops. It aimed at guaranteeing domestic food security.

Broadly speaking, the above measures may have influenced Sri Lanka's export performance during the pandemic. In addition, it is important to note that the government gave special permission for export firms to operate during the lockdown. Nevertheless, leading export firms in the apparel and textile sector witnessed the spread of the pandemic at their workplaces thereby forcing them to close down some of their factories.

Recent export performance

Table 2 reports data on realized and forecasted Sri Lanka's export performance along with the export performance of selected countries in Asia during the 2018-2022 period. According to the ADB (2021), Sri Lanka's exports contracted, in value term, by 15.9 per cent in 2020 and it is expected that Sri Lanka's exports may record a positive 16.3 per cent growth rate in 2021. Among the countries, highest export contraction in 2020 was recorded by Maldives followed by Bangladesh (see Table 2). In contrast, Vietnam, Bhutan, and Myanmar recorded a positive export growth for the same year. However, export contraction was witnessed by most of the countries owning to the demand and supply shocks emanated from the COVID-19 pandemic. In the case of Bangladesh and Sri Lanka, over 50 per cent of total exports were destined to the United States and European countries. Additionally, textiles and apparel constitute over 70 per cent of the total exports to these destinations. As a result, Bangladesh's and Sri Lanka's exports declined sharply in 2020 because the USA and European countries were heavily affected by the COVID-19 pandemic.

Table 2: Export performance in selected countries

Country	Realized export growth (%)			Forecasted export growth (%)	
	2018	2019	2020	2021	2022
Bangladesh	6.7	9.1	−17.1	13.0	9.0
Bhutan	8.6	0.9	6.7	3.1	5.6
India	9.1	−5.0	−11.9	22.4	10.0
Maldives	6.6	6.3	−28.9	12.7	13.0
Nepal	15.8	12.4	−7.5	14.2	6.5
Pakistan	12.6	−2.1	−7.2	0.0	20.0
Sri Lanka	4.7	0.4	−15.9	16.3	11.0
Indonesia	7.0	−6.8	−3.0	7.5	8.0
Malaysia	10.4	−4.3	−6.0	10.5	7.8
Myanmar	7.4	−6.8	3.4	−5.5	NA
Philippines	0.3	2.9	−11.3	6.6	10.2
Singapore	10.2	−3.8	−6.7	5.0	4.2
Thailand	7.5	−3.3	−6.6	13.0	13.8
Viet Nam	13.9	8.4	7.0	8.0	8.0

Source: Asian Development Outlook (ADO) 2021, Asian Development Bank

Table 3 reports Sri Lanka's export performance from 2019 to April 2021 by major export product categories. All export product categories, except a few products, witnessed a negative growth rate in the 2019-2020 period. Coconut based products, spices and concentrates, and other export categories recorded a positive growth in the 2019-2020 period. Textile & apparel exports, accounting for over 47 per cent of total exports, declined by 27 per cent. In contrast, tea and rubber exports, accounting for around 15 per cent of total exports, declined by around 8 per cent during the 2019-2020 period. Some luxury products such as gems and jewelry, and perishable products such as vegetable, fruits, and seafood were some of the categories which witnessed a sizable contraction during the 2019-2020 period. Product-wise export performance clearly indicates that products which are 'somewhat non-essential' witnessed a sizable decline whereas the export of 'somewhat essential' products either witnessed a small drop and/or a positive growth. This could be expected during the current pandemic since it restricted mobility and increased the need to maintain social distancing, thereby forcing people to consume only the essentials goods. Interestingly, most export product categories reported a positive growth during January-April 2021 period compared to the corresponding period of January-April 2020. This positive outlook suggests that Sri Lanka's export sector is resilient to the COVID-19 pandemic related supply and demand shocks.

Table 3: Export performance by product category

Export of goods	Value (US$ Million)		Share (%)		Growth (%)	
	2019	2020	2019	2020	2019 - 2020	Jan-Apr 2020 vs. Jan-Apr 2021
Apparel	5,577	4,406	46.7	44.4	-21	28.7
Tea	1,346	1,241	11.3	12.5	-7.8	19.5
Rubber-based	890	816	7.5	8.2	-8.3	45.5
Coconut-based	614	665	5.1	6.7	8.2	52
Gems & jewelry	314	148	2.6	1.5	-52.8	70.6
Electricals & electronic components	381	328	3.2	3.3	-13.8	41.2
Spices and concentrates	313	335	2.6	3.4	7.2	115.4
Food & beverages	364	351	3	3.5	-3.5	16.5
Seafood	262	190	2.2	1.9	-27.6	19.4
Ornamental fish	16	13	0.1	0.1	-18.6	27.7
Vegetables	32	26	0.3	0.3	-19.8	-1.1
Fruits	44	36	0.4	0.4	-18.9	5.6
Other export crops	45	68	0.4	0.7	50.2	23.3
Flowers & foliage	18	13	0.2	0.1	-29.9	8.5
Boat building	65	2	0.5	0	-96.3	4.4
Petroleum products	336	272	2.8	2.7	-19.1	-79.5
Other export crops	1,321	1,003	11.1	10.1	-24.1	49.3
Total merchandize exports	11,940	9,912	100	100	-17	29.6

Source: Sri Lanka Export Board; https://www.srilankabusiness.com/

Sri Lanka's exports to most trading partners declined during the 2019-2020 period. For instance, recording a 20 per cent contraction (around US$ 600 mn in absolute terms), Sri Lanka's exports to the USA declined from US$ 3.1 bn in 2019 to US$ 2.5 bn in 2020. Similarly, Sri Lanka's export to India declined by 20 per cent during the above period. Interestingly, Sri Lanka's exports grew faster during the January-April 2021 period compared to its corresponding period of January-April 2020. However, a sustainable recovery depends on how fast Sri Lanka's major export destinations (USA and the European region) and Sri Lanka recover from the pandemic.

During the second quarter of 2021, Sri Lanka started witnessing the third wave of the pandemic. Initially, the government locked down some identified administrative regions. However, from the 21st of May onwards, an island-wide lockdown was imposed following

the continued surge in COVID-19 cases in all administrative districts. Despite the lockdown, essential services and export and agriculture related activities have been allowed to operate following strict health guidelines. However, the extent to which Sri Lanka can maintain the impressive export performance recorded during the first quarter of 2021 in uncertain. One of the positive developments is that most export destination countries started recovering from the pandemic owing to the vaccination programmes launched during the last few months. It is expected that the demand for Sri Lanka's exports may gradually recover in 2021-2022 period amidst the third wave related domestic supply constraints.

Table 4: Direction of exports

Country	Value (US$ Million)		Share (%)		Growth (%)	
	2019	2020	2019	2020	2019-2020	Jan-Apr 2020 vs. Jan-Apr 2021
United States	3,139	2,507	26.3	25.3	-20.1	21.2
United Kingdom	998	910	8.4	9.2	-8.8	16.0
India	759	605	6.4	6.1	-20.4	33.8
Germany	646	570	5.4	5.8	-11.7	47.2
Italy	531	457	4.4	4.6	-13.9	57.8
Belgium	352	295	2.9	3.0	-16.1	34.0
Netherlands	301	290	2.5	2.9	-3.6	88.5
China	229	223	1.9	2.2	-2.6	64.9
Canada	240	213	2.0	2.1	-11.4	59.7
Turkey	210	208	1.8	2.1	-0.6	24.6
Other markets	4,535	3,632	38.0	36.6	-19.9	24.8
Total	11,940	9,912	100.0	100.0	-17.0	29.6

Source: Sri Lanka Export Board; https://www.srilankabusiness.com/

The impact of COVID-19 on exports depends, to a great extent, on the size of the demand and supply shocks witnessed by the country. The traditional gravity model framework allows us to identify the key determinants of export flows and those determinants link, in

one way or the other, with the demand and supply conditions of the exporting and partner countries. One could assess the possible impact of COVID-19 on exports based on the relationship of exports with its domestic and foreign market determinants.

Determinants of exports

Table 5 presents the estimated results of the determinants of Sri Lanka's total exports and exports of selected product categories. In the *total export* model, most explanatory variables are statistically significant and estimated coefficients are in line with theoretically expected signs. For instance, the partner country GDP is positive (0.939) and statistically significant at one per cent level of significance. This implies that a one per cent increase in the partner countries' GDP leads to nearly one per cent (0.94 per cent) increase in Sri Lanka's total exports. In other words, Sri Lanka's total exports increase if economies of the partner countries perform well. The same is true in the context of economic slowdown, implying that economic slowdown in partner countries leads to a decline in Sri Lanka's total exports. Partner countries' GDP aim at capturing the demand for Sri Lanka's exports, hence, the impact on Sri Lanka's exports emanating from demand shocks could partially be captured via changes in the GDP of partner countries during the pandemic.

Theoretically, the size of the domestic economy is taken as one of the key determinants of the export flow. Quite surprisingly, there is no statistically significant evidence to suggest that the country's GDP is one of the determinants of Sri Lanka's export performance. The lack of statistical evidence, in this instance, may be because Sri Lanka's GDP growth in recent years was largely driven by the expansion of the non-tradable sector, such as construction, power and energy, and communication. In fact, the share of exports to GDP declined in the post-2000 period due to the expansion of the non-tradable sector (Athukorala & Jayasuriya, 2012). According to the Central Bank of Sri Lanka, export to GDP ratio declined from 30 per cent in 2000 to 14.2 per cent in 2019 (CBSL, 2019). Baldwin and Tomiura (2020) argue that it is possible to capture the supply related shock on export flows through the relationship between exports and the GDP of the reporting country. In the light of our findings (i.e., the estimated coefficient of the reporting country's GDP is statistically insignificant, implying that the reporting country's GDP has no impact on the country's exports), is it possible to argue that the reduction in the country's GDP has no impact on Sri Lanka's export performance? It is highly probable that the supply disruption due to COVID-19 related mobility restrictions may have affected exports. Nevertheless, one cannot use the

estimated coefficient of the reporting country's GDP, reported in Table 5, to assess the supply impact of COVID-19 on Sri Lanka's export. For the purposes of this assessment, alternatively, the relationship between the GDP and exports was quantified by employing a short-run time series model6. The estimated coefficient from the above model was utilized for assessing the supply impact on exports.

As Saif et al. (2021) suggested, COVID-19 induced policy shocks are also important when assessing the impact of COVID-19 on export flows. Some policies may directly affect the GDP in the short run, while, other policy shocks may take time to be reflected through either the reporting country's or partner countries' GDP. One among them is the changes into export and import policies. According to the World Trade Organization (2020), many countries, both developed and developing, took measures to promote domestic production and to protect their weak balance of payment position via import restrictions. Hence, the possible impacts of such policy changes need to be taken into account when assessing the impact of COVID-19 on exports. Changes into foreign trade and investment policy directly affect the level of foreign trade and investment freedom. It is found that the level of trade and investment freedom in partner countries is an important determinant of Sri Lanka's export flows (see Table 5). For instance, the estimated coefficient of trade freedom index is positive and statistically significant with respect to the model estimated for the total exports (see Table 5). In other words, Sri Lanka is likely to export more goods to countries that maintain relatively lower barriers to trade and investment. With respect to most export product categories, the estimated coefficients of trade and investment freedom indices are statistically significant (see Table 5).

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6 A simple time series model was estimated to capture the effect of the growth of the GDP on exports. This approach is valid since some studies have found evidence that the export-led growth hypothesis is not held for Sri Lanka (Tahir *et.al.,* 2015; Dilrukshini, 2009; Shirazi and Manp, 2005).

Table 5: Determinants of export flows – Sri Lanka

Variable	Total exports	Electronic and related goods	Fish & fish products	Rubber and rubber products	Spices	Tea	Textile & apparel
			Dependent Variable				
Distance (log)	-0.654***	-1.686***	-1.506***	-0.123	1.453***	-1.243***	-0.0386
	(0.0872)	(0.186)	(0.238)	(0.0775)	(0.144)	(0.161)	(0.132)
Partner country GDP (in log)	0.939***	0.936***	0.856***	0.887***	0.503***	0.550***	1.144***
	(0.0247)	(0.0543)	(0.0588)	(0.0264)	(0.0430)	(0.0367)	(0.0415)
Reporting country GDP (in log)	-0.0450	1.842	0.920	-1.396***	0.138	-0.452	-0.0489
	(0.585)	(1.336)	(1.212)	(0.518)	(0.997)	(0.890)	(0.827)
Indo-Lanka FTA (dummy)	-0.560	-1.276***	-6.044***	0.171	2.651***	0.609	-0.541
	(0.438)	(0.488)	(1.561)	(0.301)	(0.480)	(0.563)	(0.595)
Pakistan-Sri Lanka FTA	-0.510	-2.335***	-5.754***	0.887***	-0.0891	1.059	-1.921***
	(0.446)	(0.524)	(1.501)	(0.325)	(0.573)	(0.721)	(0.596)
SAFTA (dummy)	1.499***	2.911***	2.732	0.801**	3.403***	-2.287***	1.709***
	(0.459)	(0.551)	(1.756)	(0.315)	(0.568)	(0.547)	(0.637)
Colonial relationship (dummy)	1.250***	1.334***	0.773*	0.492***	0.220	0.354	3.162***
	(0.138)	(0.305)	(0.409)	(0.137)	(0.236)	(0.237)	(0.227)
Trade freedom (in log)	1.776***	0.0594	6.338***	0.152	0.783	1.176*	1.181
	(0.628)	(1.090)	(1.916)	(0.482)	(0.878)	(0.637)	(0.937)
No of FTA signed by partner country	-0.00924**	-0.0201**	-0.0211***	0.00557	-0.0224***	-0.0116**	0.0191***
	(0.00363)	(0.00799)	(0.00719)	(0.00342)	(0.00497)	(0.00534)	(0.00553)
Investment freedom (in log)	0.511***	1.240***	0.841***	0.781***	-0.209	0.140	0.910***
	(0.140)	(0.265)	(0.292)	(0.102)	(0.204)	(0.185)	(0.168)
Constant term	-24.37	-62.47*	-64.39*	9.499	-32.48	3.074	-37.03*
	(15.02)	(33.31)	(33.41)	(13.11)	(25.00)	(22.27)	(21.17)
No of observations	989	753	435	789	491	803	702
R-squared	0.678	0.404	0.478	0.713	0.420	0.291	0.679

Note: Robust standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1.

In addition to the reporting country's GDP, variables such as the manufacturing sector production index and real effective exchange rate were considered as supply-related variables. Those variables were found to be insignificant and the final regression models were estimated by omitting such variables.

The estimated models were examined for possible violations of Ordinary Least Square assumptions, and it was found that the assumption of homoscedasticity is violated across all the models. The robust standard errors were derived for correcting the heteroskedasticity issue in the model. Our diagnostic checks confirm that the estimated models meet the other assumption satisfactorily.

Assessing the impacts of COVID-19 on exports

Table 6 reports estimated coefficients for assessing the impact of COVID-19 on Sri Lanka's exports. The regression evidence indicates that Sri Lanka's GDP does not affect export flows in a statistically meaningful manner. As mentioned above, the impact of Sri Lanka's GDP on its exports was examined by employing a short-run model where the dependent variable was the growth of exports, and the growth of GDP was the one and only explanatory variable. To quantify the relationship between the GDP and exports, a short-run model was estimated for the period from 1959 to 2019[7]. In line with theoretical expectation, the estimated coefficient is statistically significant and positive. Trade and investment freedom variables are statistically significant for some export categories[8]. Table 6 reports estimated coefficients which are statistically significant at a conventional level of significance, and statistically insignificant coefficients are indicated as zero.

Table 6: Estimated coefficients for impact assessment

Export category	Partners GDP	Sri Lanka GDP**	Trade freedom	Investment freedom
Tea	0.550	0.496	1.176	0
Rubber & related	0.887	0.496	0	0.781
Spices & related	0.503	0.496	0	0
Electrical and electronic	0.936	0.496	0	1.240
Fish & related	0.856	0.496	6.338	0.841
Textiles and Apparel	1.144	0.496	0	0.910
Total Exports	0.939	0.496	1.776	0.511

Note: Zero indicates that the estimated coefficient is not statistically significant.
***derived using 1959-2019 time series data analysis data.
Source: Derived from Table 5

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[7] This period was considered since it allows to have a bigger sample for the estimation.
[8] If an estimated coefficient is not statistically significant, value of zero was applied.

For assessing the impact of COVID-19 on Sri Lanka's export flows, this study makes use of GDP forecasts published by the IMF. The IMF forecasts that the real GDP in advanced countries will contract by 8 per cent for the year 2020, while Sri Lanka's real output is expected to contract by 0.5 per cent (Central Bank of Sri Lanka, 2019)[9]. This study uses the GDP forecasts for advanced countries to represent the GDP figures of Sri Lanka's trading partners. Similarly, this study assumes the level of trade and investment freedom to decline in partner countries owing to some of the restrictive measures introduced by countries to face the challenges posed by the COVID-19 pandemic. Hypothetically, it was assumed that trade and investment freedom indices would decline by 1 per cent from their levels prior to the pandemic.

Table 7 and 8 present three different scenarios of the impact of COVID-19 on Sri Lanka's export flows. As detailed previously, the three scenarios were established on the basis of 95% confidence intervals. The estimated coefficient values (mean) were taken as the second scenario while lower and upper bound 95% confidence values were taken for assessing the first and the third scenarios. Scenario 1 predicts Sri Lanka's total exports to contract by 9.4 per cent in 2020 compared to the previous year. In terms of export value, it is estimated that Sri Lanka will lose around USD 1.1 billion worth of export earnings. In contrast, scenario 2 predicts an annual decline of 13 per cent, with a corresponding loss of USD 1.6 billion in export earnings. In contrast to the above two scenarios, the third scenario predicts Sri Lanka's total exports to contract by around 19 per cent, with a corresponding loss of US $ 2.2 billion in export earnings.

The present study was conducted in July 2019 and according to first six months, Sri Lanka had lost around US$ 1.5 billion worth of exports. However, at present, the realized export values are available for the entire period. Accordingly, Sri Lanka lost around US$ 2.03 bn worth of exports during the 2019-2020 period. The realized data show that our third scenario has predicted the impact of COVID-19 on Sri Lanka's total exports quite correctly.

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[9] This refers to the status of expectation in July 2019 during which this study was commissioned.

Table 7: Expected impact of COVID-19 on export flows (year 2020)

Export category	Scenario 1	Scenario 2	Scenario 3
Tea	-5.5	-8.6	-14.0
Rubber & related	-8.9	-11.4	-16.6
Spices & related	-5.0	-7.0	-12.5
Electrical and electronic	-8.9	-12.4	-18.1
Fish & related	-8.0	-17.5	-23.3
Textiles and Apparel	-11.1	-14.0	-19.5
Total Exports	-9.4	-13.4	-18.6

Source: Author's estimation

Table 8: Expected impact of COVID-19 on export flows (year 2020)

	Scenario 1	Scenario 2	Scenario 3
Tea	73.3	114.2	185.3
Rubber & related	79.6	101.9	148.0
Spices & related	13.9	19.6	35.0
Electrical and electronic	35.6	49.5	72.3
Fish & related	22.4	48.9	65.1
Textiles and Apparel	577.9	729.4	1013.9
Total Exports	1113.4	1,581.1	2,187.0

Source: Author's calculation

Table 9 & 10 present forecasts for export performance by selected export categories in three scenarios. It is expected that Sri Lanka's export performance will gradually pick up in 2021. Nevertheless, such performance may fail to push the export earnings to pre-COVID-19 levels, i.e., passing US $ 11.94 billion. The IMF forecasts advanced economies to grow at a rate of 4.8 per cent, and Sri Lanka to grow at a rate of 4.5 per cent in 2021. While it would be possible to avoid supply shock impacts due to favorable growth performance in the country, the unfavorable external demand situation will be a bottleneck for Sri Lanka's export performance. Under the scenario 3, Sri Lanka's export earnings in 2021 is expected to reach USD 10 billion, which is USD 1.6 billion less than the figure reported in 2019. Under scenario 2, Sri Lanka's total export is expected to amount to USD 10.7 billion, which is around US $ 1 billion less than the total export earnings in 2019. In this context, it is clear that Sri Lanka will be unable to reach the pre-COVID-19 export levels within 2020-2021.

Table 9: Export performance in 2021

	Scenario 1	Scenario 2	Scenario 3
Tea	4.4	4.7	5.1
Rubber & related	6.1	6.3	6.6
Spices & related	4.1	4.5	4.9
Electrical and electronic	6.1	6.6	7.1
Fish & related	5.6	6.2	6.7
Textiles and apparel	7.2	7.6	8.0
Total exports	6.4	6.6	6.8

Source: Author's calculation

Table 10: Export performance in 2021

	Scenario 1	Scenario 2	Scenario 3
Tea	1,296	1,299	1,304
Rubber & related	866	867	870
Spices & related	349	350	351
Electrical and electronic	348	350	351
Fish & related	201	202	203
Textiles and apparel	4,723	4,741	4,758
Total exports	10,547	10,567	10,587

Source: Author's calculation

The impact of COVID-19 on Sri Lanka's exports to selected destinations

The United States and European countries have been Sri Lanka's major trading partners and mostly textiles & apparel, footwear, gems and jewelry, and rubber-based products are exported to those countries. In addition, processed agricultural commodities and well as spices are exported to European countries. The USA and European countries accounted for nearly 56 per cent of Sri Lanka's total exports in 2019. Given this relative importance of those destinations and the severity of the COVID-19 pandemic in the USA and Europe, it is imperative to assess the impact of COVID-19 on Sri Lanka's exports to these destinations. The estimated coefficients reported in Table 6 and IMF forecast on growth of real GDP are utilized in assessing the impact of COVID-19 on Sri Lanka's exports to the USA and Europe. Table 9 and 10 report the estimated impact for 2020 and 2021 respectively.

According to the estimates, exports to the USA are expected to contract by 14 per cent in 2020 compared to 2019. This decline is around US$ 450 Mn in absolute terms. Nevertheless, it is expected that the USA destined exports would grow around 5 per cent, although it is

not sufficient to reach the pre-pandemic level in 2019. Sri Lanka's exports to the EU (except the UK) will also decline, however, to a lesser extent compared to the decline witnessed in the USA market. The estimates suggest that Sri Lanka's exports to the Euro area (except the UK) would contract by around 8 per cent. As in the case of the US market, Sri Lanka's exports to the EU area in 2021 may not reach its 2019 level.

Table 11: The impact of COVID-19 on Sri Lanka's exports to selected destinations

	Expected change in Sri Lanka's exports	
	2020	2021
EU (less UK)	-8.10	3.30
USA	-14.23	5.40
UK	-9.40	6.10

Source: Author's calculation

Conclusion

This study seeks to assess the impact of COVID-19 on Sri Lanka's export flows. Following Saif et al*.,* (2021) and Baldwin and Tomiura (2020), this study employs the traditional gravity model framework to identify the key determinants of Sri Lanka's exports and has utilized the estimated coefficients along with macro forecasts published by the IMF in assessing the impact of COVID-19 on exports. The basis for the assessment is that movements related to the GDP (of reporting country and partner countries) reflect the demand and supply related shocks emanating from COVID-19 related restrictions.

First, determinants of exports were examined by employing gravity models where several key variables such as distance, the GDP of partner countries and reporting country, membership of free trade agreements, level of trade and investment freedom, and the number of free trade agreements signed by partner countries were considered as independent variables. Second, the impact of COVID-19 on export flows was assessed using the estimated coefficients and the IMF GDP forecasts for 2020 and 2021. Therefore, the forecast on GDP growth numbers for Sri Lanka reflects the supply shocks experienced due to the pandemic, while the GDP numbers for trading partners reflect the possible demand-related shocks on Sri Lanka's export flows.

This analysis found that the partner country GDP and level of trade and investment freedoms positively affect Sri Lanka's export flows. However, there is no statistical evidence to suggest that Sri Lanka's GDP affects its export flows. Nevertheless, it is apparent that the

COVID-19 pandemic related supply shocks would have a negative impact on export flows. Therefore, the impact of the GDP on exports is derived based on a short-run time series framework. In recent months, some countries took drastic policy measures to restrict trade and investment flows partly to counter the negative economic consequences of the COVID-19 pandemic. These measures may alter the level of trade and investment freedom in partner countries, thereby having an impact on Sri Lanka's export flows. These changes are also considered in this assessment as such policy measures are closely interconnected with the COVID-19 pandemic responses.

The assessment presents results based on three different scenarios. Scenarios 1 and 2 predict Sri Lanka's total exports to be between 9 to 13 percent in 2020, while scenario 3 predicts Sri Lanka's total exports to contract by 19 per cent this year. Under scenario 3, Sri Lanka is expected to lose approximately USD 2.7 billion worth of export earnings in 2020. Moreover, the impact on textiles and apparel and seafood is found to be particularly severe in comparison to other export categories such as tea and spices. While Sri Lanka's export flows are expected to grow at a rate of around 5-6 per cent by 2021, export earnings are still unlikely to reach their pre-COVID-19 levels in 2021.

The assessment clearly indicates that exports to Sri Lanka's major trading partners, such as the USA and the EU, would decline significantly due to two reasons. First, both the USA and the EU were heavily affected by the pandemic and, as a result, those countries witnessed a sharp decline in economic activities resulting in high GDP contraction. Demand for exports will be relatively less due to the decline in purchasing power. Second, Sri Lanka mostly exports textiles and apparel, footwear, gems and jewelry to the USA and the EU region. Our analysis shows that such products are very sensitive to GDP movements. Hence, COVID-19 related negative impacts on exports will be exacerbated due to the composition of our export basket. Thus, it is important that Sri Lanka examines opportunities within the major exporting industries to overcome the negative impact emanating from lower demand for traditional products. Some apparel and textiles companies have started exporting some products, such as masks and surgical gloves, which are in high demand due to the present pandemic.

This study is an important addition to the limited literature on the impact of COVID-19 on the exports of developing countries. In particular, it explores possible negative

consequences that developing countries may face due to trade and investment restriction regimes that some partner countries may adopt.

References

Asian Development Bank. (2021). *Asian Development Outlook (ADO) 2021*. Asian Development Bank.

Athukorala, P., & Jayasuriya, S. (2012). Economic policy shift in Sri Lanka: The post-conflict development challenge. Working Paper No. 2012/15, 1-42, Australian National University.

Baldwin, R., & E. Tomiura. (2020). Thinking ahead about the trade impact of COVID-19. In Baldwin, R. & B.W. di Mauro (Eds.), *Economics in the time of COVID-19*. CEPR Press

Central Bank of Sri Lanka. (2019). *Annual report*. Central Bank of Sri Lanka.

Central Bank of Sri Lanka. (2020). *Annual report*. Central Bank of Sri Lanka.

DCS. (2020). *National accounts estimates of Sri Lanka*. Department of Census and Statistics of Sri Lanka

Dilrukshini, W.A. (2009). Is the export-led growth hypothesis valid for Sri Lanka? A time-series analysis of export-led growth hypothesis. *Staff Studies, 38*(1), 75–94.

IMF (2021). World Economic Outlook 2021. International Monetary Fund. https://www.imf.org/en/Publications/WEO/Issues/2021/07/27/world-economic-outlook-update-july-2021

Kazunobu, H., & Hiroshi, M. (2020). Impacts of COVID-19 on international trade: Evidence from the first quarter of 2020. *IDE Discussion Papers 791*. Institute of Developing Economies, Japan External Trade Organization, 1-48.

Saif, N.M.A., Ruan, J., & Obrenovic, B. (2021). Sustaining trade during COVID-19 pandemic: Establishing a conceptual model including COVID-19 impact. S*ustainability*, *13*, 1-20.

Shirazi, N.S., & Manap, T.A.A. (2005). Export-led growth hypothesis: Further econometric evidence from South Asia. *The Developing Economies, 43,* 472-488.

Sri Lanka Export Board. Online database. https://www.srilankabusiness.com/

Tahir, M., Khan, H., Israr, & M., A. Qahar. (2015). An analysis of export led growth hypothesis: Cointegration and causality evidence from Sri Lanka. *Advances in Economic Analysis & Policy, 3*(2), 62-69.

United Nations Conference on Trade and Development. (2020). *The impact of COVID-19 on trade and development: Transitioning to a new normal.* Geneva: United Nations.

World Trade Organization. (2020). *Cross-border mobility, COVID-19 and global trade*. Information Note, Geneva: World Trade Organization.