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The Impact of COVID-19 on the Global and Intra-Commonwealth Trade in Goods

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Abstract

This paper employs the gravity model of international trade to examine the effect of the COVID-19 pandemic on global and intra-Commonwealth trade flows. It uses bilateral monthly exports data at the HS6 level and the number of COVID-19 cases and deaths, as well as the stringency of measures taken to contain the virus, to estimate the effect of the pandemic on Commonwealth countries' trade. The study finds that the incidence of COVID-19 in both exporting and importing countries has impacted on Commonwealth trade flows and that the extent of the effect varies with the development level of trading partners. High numbers of COVID-19 cases, including deaths, in low-income importing countries led to a reduction in Commonwealth exports, while a high incidence of COVID-19 in high-income importing countries led to with an increase in their exports. The incidence of COVID-19 in an exporting country was also found to impact on trade among a global sample of countries. Restrictions aiming to contain COVID-19 in high-income countries were associated with an increase in Commonwealth countries' trade. Short-term projections of trade trends point towards a negative change in both exports and imports of Commonwealth countries. The study also proposes a set of policy options and recommendations targeting sustainable recovery and building resilience in Commonwealth economies.

JEL Classifications: E00, F10, F62
Keywords: COVID-19, goods, international trade, Commonwealth, trade flows

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Abbreviations and Acronyms

ACFTA	African Continental Free Trade Area
CEPII	Centre d'Etudes Prospectives et d'Informations Internationales
CES	constant elasticity substitution
CGE	computable general equilibrium
DD	difference-in-difference
FDI	foreign direct investment
FE	fixed effects
FTAs	free trade agreements
GDP	gross domestic product
GVCs	global value chains
IMF	International Monetary Fund
LDCs	least developed countries
MRT	multilateral resistance terms
NLS	non-linear least squares
OLS	ordinary least squares
PPML	Poisson pseudo maximum likelihood
WTO	World Trade Organization

1. Introduction

The COVID-19 pandemic generated a global shock of unprecedented magnitude, with a devastating effect on international trade flows (WTO, 2020a). This followed from disruption of economic activity as a consequence of lockdowns, travel restrictions, international border and port closures, and other virus-containment measures resulted in a macroeconomic shock. Several accounts indicate that 2020's global recession has been the worst since 1930 (Blake and Wadhwa, 2020; Hevia and Neumeyer, 2020). The pandemic affected trade flows along both supply and demand channels (Lakatos, 2020). In 2020, global trade flows collapsed on average by around 8 per cent (WTO, 2020b); that impact, however, has varied across countries and regions, largely depending upon the level of development, trade structure, stringency of containment measures, and governments' capacity to implement policies supporting business and households.

The pandemic had a disproportionately severe economic and trade effect on 54 Commonwealth countries. It induced a deep recession in 45 Commonwealth economies, the gross domestic product (GDP) of which collapsed by US $1.45 trillion in a single year. This translated to $345 billion forgone in member countries' global exports and $60 billion in intra-Commonwealth trade flows. Among other things, their large populations, heavy reliance on commodities exports, and similar deep recessions in major export markets, made these countries particularly susceptible to financial contagion (see section 2). Moreover, because of pre-existing structural vulnerabilities, COVID-19 proved to be a particular problem for low-income countries, including several of the Commonwealth's small states.

Against this backdrop, there has as yet been no detailed contextualisation of the linkage between the incidence of COVID-19 and the trade flows within the diverse group of countries that comprise the Commonwealth. The International Monetary Fund (IMF) estimated a fall in commodity prices with an adverse impact on trade and the macroeconomic situation of those countries affected (IMF, 2020). Thus, the effect of COVID-19 on trade may be particularly acute for Commonwealth countries, which largely rely on exporting fuels, agricultural commodities and minerals.

Given that around 70 per cent of Commonwealth countries' exports comprise merchandise, this study examines how the COVID-19 shock has impacted bilateral merchandise trade in those countries. It employs recent advancements in empirical modelling to estimate the aggregate effect of the COVID-19 pandemic on the global and intra-Commonwealth trade in member countries' goods and to explore the heterogeneity (or otherwise) of that impact across various groups, including the least developed countries (LDCs) and small states. It also develops a set of policy options and recommendations aiming to revive merchandise trade flows in the Commonwealth and ensure a sustainable recovery from the economic impact of the COVID-19 pandemic, as well as to build resilience against future shocks.

Few studies have examined the relationship between trade and COVID-19. To our knowledge, only Hayakawa and Mukunoki (2020), Espitia et al. (2021), and Friedt and Zhang (2021) have used an econometric approach to examine the impact of COVID-19 on trade. None of these, however, focuses on how the pandemic has impacted Commonwealth trade. Thus this paper aims to fill a gap in the literature and inform discussions of the potential impact of COVID-19 on Commonwealth merchandise trade flows, as well as to offer recommendations for policy to revive Commonwealth countries' economies.

The paper uses bilateral monthly exports data from January 2019 to November 2020 to examine the short-term effects of the COVID-19 pandemic on global and intra-Commonwealth trade in member countries' goods, including among these countries the LDCs and small states. We examine the exporting Commonwealth countries and their trading partners to investigate how shocks related to COVID-19 and sector characteristics may have impacted on trade relationships. The study uses three different measures of the incidence of COVID-19 in a country: the number of COVID-19 infections, the number of deaths and the stringency of measures aiming to contain the virus.

The paper is structured as follows.

- In section 2, we provide descriptive evidence of the impact of COVID-19 on Commonwealth countries' economies.
- Section 3 presents an overview of the current literature on the economic impact of COVID-19.
- Section 4 offers insight into the data and the empirical specification of the gravity model, as well as delivers our main findings.
- In section 5, we draw some conclusions and make recommendations for Commonwealth countries seeking to build resilience and protect their economies against future shocks.

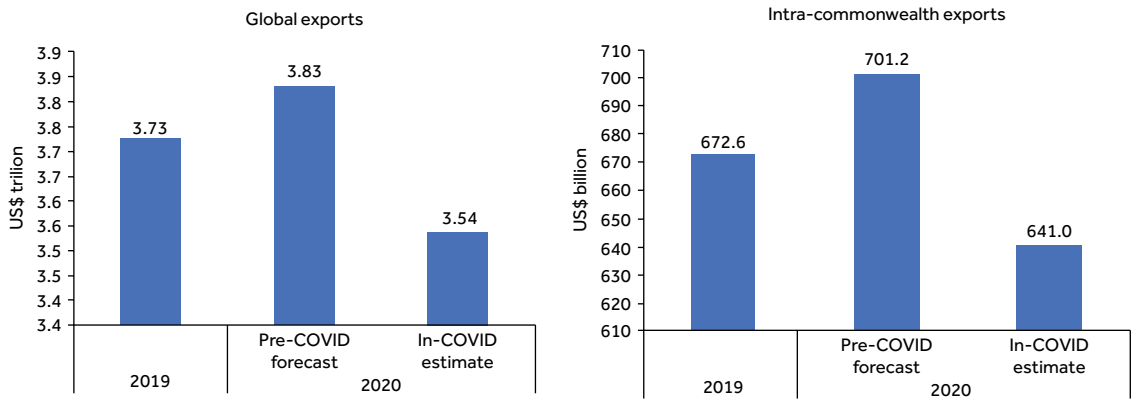
2. Correlations between the COVID-19 pandemic and Commonwealth countries' trade flows

The Commonwealth is diverse group of 54 countries stretching from the east coast of New Zealand to the western parts of the Caribbean and South America. Six Commonwealth member countries are developed, while 48 are at various levels of economic development. This is not a formal trade bloc, but myriad drivers of international trade, such as a common language (English being a first or second language in most Commonwealth countries), a shared colonial history, some cultural common ground and similar legal systems, underpin the trade and economic relationships within this heterogeneous association.

The COVID-19 pandemic wreaked havoc on most of the Commonwealth countries' economies. As of 20 March 2021, Commonwealth populations had succumbed to 20 million infections and witnessed 1 million deaths (Roser et al., 2020). This crisis was accompanied by a severe drop in the Commonwealth's global and intra-Commonwealth trade flows (see Figure 1). Relative to pre-pandemic growth trends, Commonwealth economies contracted by around 10 per cent in 2020, making this group of countries an interesting case in which to study the implications of the pandemic. While some of them have been able to contain the pandemic and resume production and trading activities, at time of writing most Commonwealth countries are still struggling to tame the pandemic.

Several factors likely contributed to the seismic trade meltdown in these economies. First, the Commonwealth is home to 32 per cent of the world's people and its membership includes four of the ten most populated countries (India, Pakistan, Bangladesh and Nigeria). Aside from

Figure 1. Commonwealth's global and intra-Commonwealth exports compared, 2019 and 2020



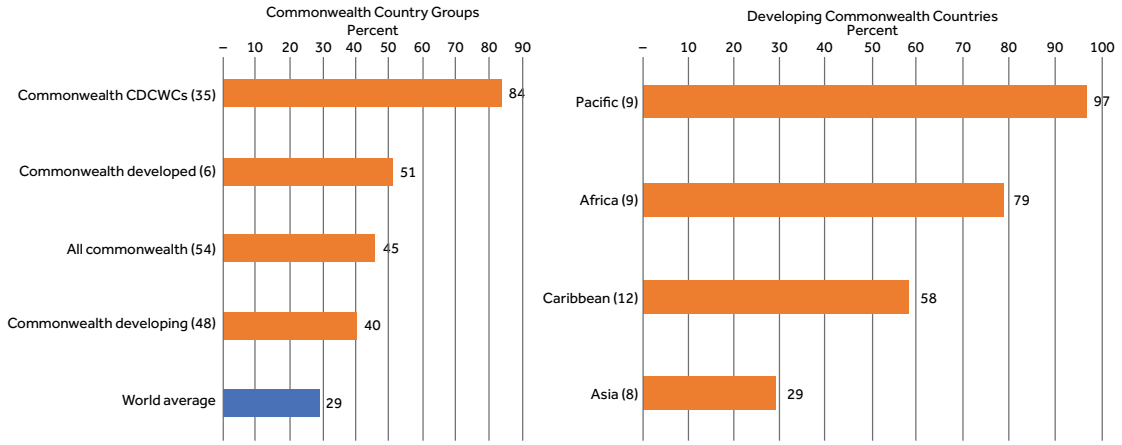
Note: Calculated using the IMF's pre-pandemic forecasts (October 2019) and in-pandemic estimates (April 2021), and trade-to-GDP ratios taken from the World Development Indicators.
Source: Commonwealth Trade Review (2021).

these demographic reasons, several underlying structural factors made these countries particularly vulnerable to the trade contagion.

Second, two-thirds of the Commonwealth's global and intra-Commonwealth trade is in manufactured goods and commodities. For many member countries, especially developing countries, the proportion of commodities in gross national exports ranges from 40 per cent to more than 95 per cent, which is extremely high compared with the world average of 29 per cent (see Figure 2). These economies were consequently hit particularly hard when commodities prices dropped.

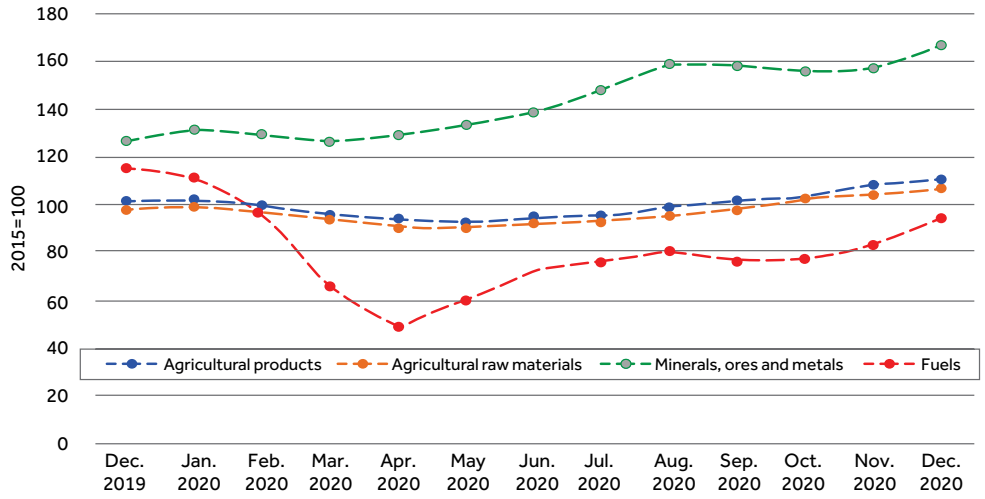
Commonwealth countries' main commodity exports are food products, mineral ores, metals and fuels. Among these, fuels are the most exported, constituting around 42 per cent of all commodities exports. This is followed by mineral ores (36 per cent) and agri-food products (22 per cent). Around 55 per cent of these exports are destined for only five markets: China, the USA, the European Union, the United Kingdom and Australia. The COVID-19 pandemic negatively affected demand for commodities in these countries, leading to a collapse in commodity prices, particularly of fuels. The prices of other key commodities, such as agricultural products and mineral ores, were relatively less affected. Nevertheless, a reduction in demand, along with challenges associated with production and exporting, led to an aggregate export loss of around US $125 billion for Commonwealth countries in 2020—even though the prices of most commodities had surged in the second half of 2020, offsetting some of the earlier trade losses in commodity-dependent economies (see Figure 3).

Figure 2. Excessive reliance of Commonwealth countries on commodities exports



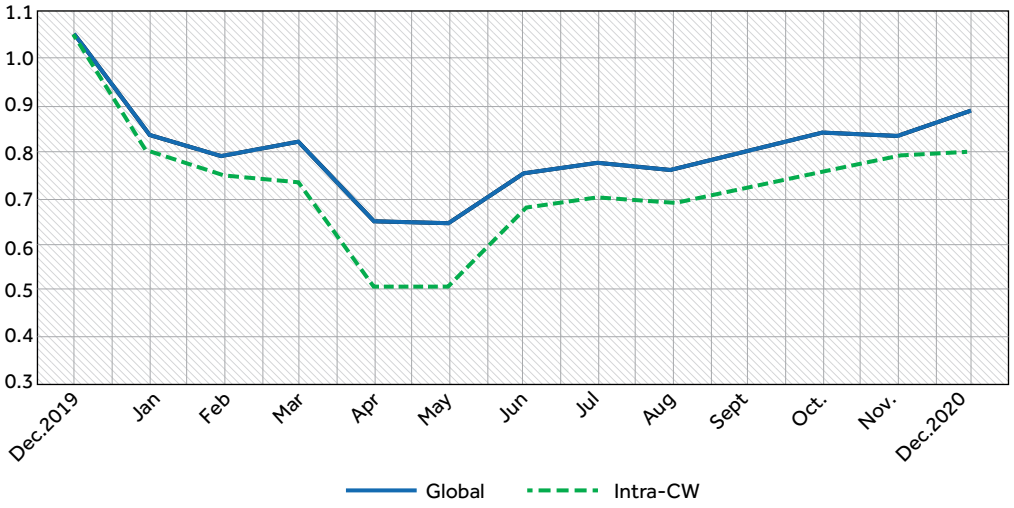
Source: Ali et al. (2020).

Figure 3. Monthly variation in commodity price indices in 2020



Source: Calculated using data from UNCTADstat.

Figure 4. Impact of the pandemic on Commonwealth merchandise exports, December 2019 to December 2020



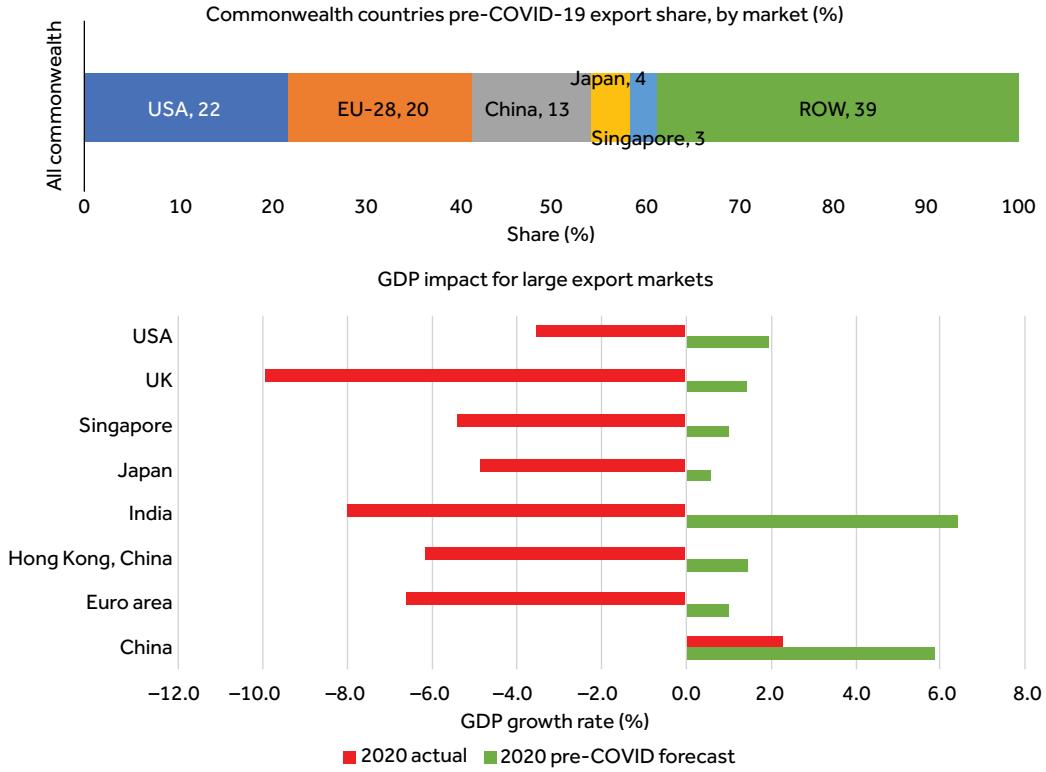
Note: Exports are indexed to 1 in December 2019.
Source: Commonwealth Trade Review (2021).

The adverse effect of the pandemic on global and intra-Commonwealth merchandise exports was first felt in early January 2020, immediately after the outbreak of the novel coronavirus in China in December 2019. The most marked effect occurred during April and May 2020, when the USA and many large export markets in Europe imposed national lockdowns. In these two months, Commonwealth members' exports dropped to almost half their baseline (see Figure 4). The impact was higher for intra-Commonwealth exports compared with global exports because many of the large intra-Commonwealth traders—including India, Singapore, South Africa and the United Kingdom—experienced an economic contraction, affecting supply and demand. Exports plateaued in May 2020, but they rebounded in June 2020 as firms sought to adapt to pandemic containment measures. At time of writing, merchandise exports are gradually recovering as lockdowns and other restrictions on economic activities are lifted in many countries. In December 2020, however, the Commonwealth's exports were still well below their pre-pandemic levels in December 2019.

The drop in Commonwealth countries' exports correlates strongly with incidence of the virus. Those countries with high numbers of infections (and deaths) and with strict containment measures in place are those that have experienced a large decline in trade flows.

Finally, the period of the pandemic saw constrained economic growth in the Commonwealth's major export markets, adversely affecting demand for goods and services (see Figure 5). Other than China, where GDP expanded by 2.3 per cent, the major destinations for Commonwealth exports recorded significant contractions in GDP in 2020. In India and Singapore, GDP declined by more than 5 per cent. In the USA, which absorbs 31 per cent of developed Commonwealth members' goods and services exports and 12 per cent of those from developing members, GDP contracted by 3.5 per cent. The European Union, which collectively represents the second-largest market for Commonwealth exports, contracted by 6.6 per cent. Within the EU-27, growth in the three top destinations for Commonwealth exports—Germany, France and the Netherlands—fell by 4.9 per cent, 8.2 per cent and 3.7 per cent, respectively. Similarly, the GDP of the United Kingdom, a key destination for intra-Commonwealth exports, dropped by around 9.9 per cent. These markets collectively absorb around 75 per cent of Commonwealth developed members' exports and around half those of developing countries. At time of writing, most of these economies are still subject to various virus-containment measures.

Figure 5. Commonwealth market share and GDP drop for large export markets (%)



Source: Commonwealth Trade Review (2021).

3. Literature review

The COVID-19 pandemic resulted in an economic shock across countries that, in turn, impacted GDP and generated an economic downturn, with a negative effect on international trade. Studies highlighting pandemic-related shocks to demand and supply attribute transmission of these shocks to the disruption of global value chains (GVCs) (Baldwin and Freeman, 2020; Baldwin and Tomiura, 2020). These studies suggest that the pandemic disrupted manufacturing sectors when containment efforts stifled direct supply, with impact on the international flow of intermediate inputs, and when global demand dropped as consumer spending slowed and investment was delayed.

On the demand side, Correia and colleagues (2020) examine the economic contagion as COVID-19 impacted the aggregate demand channel and depressed household spending, leading to business uncertainty about future demand and an adverse effect on business investment. McKibbin and Fernando (2020) offer a supply-side analysis of the pandemic and suggest that reduced labour supply increased the cost of production. Similarly, social distancing measures introduced to reduce the spread of the disease affected production, consumption and trade patterns, both directly and indirectly (Espitia et al., 2021). Those examining the impact of measures imposed to prevent the spread of COVID-19 unanimously agree that the restrictions led to a sharp economic downturn.

Studies examining the relationship between trade and COVID-19 focus mainly on GVCs and whether these absorbed or transmitted COVID-19 shocks. Baldwin and Tomiura (2020), Javorcik (2020a, 2020b) and Miroudot (2020), for example, report that GVC disruptions magnified pandemic-induced production shock and impacted adversely on all of output, employment and trade. Others, such as

Sforza and Steininger (2020), Meier and Pinto (2020), and Eppinger et al. (2020), have investigated interconnectedness and the channels through which economic shock is transmitted, finding that the economic effect of COVID-19 was spread through supply chain linkages, with particularly severe consequences for highly integrated economies compared to those less integrated in GVCs.

Eppinger and colleagues (2020) and Gerschel et al. (2020) also examine the global interconnectedness of international trade and GVCs, showing that slowing productivity in China's Hubei province impacted on the global economy. Friedt and Zhang (2021) employ gravity modelling to specifically examine the impact of the pandemic on Chinese exports and to explore the heterogeneity of trade effects across Chinese provinces, international trade partners and commodities. Their results show that GVC contagion reduced Chinese exports by 40–45 per cent during the first half of 2020—that is, that Chinese exports were highly sensitive to rising rates of infection both nationally and globally. Fernandes (2020) uses difference-in-difference (DD) techniques to focus on trade resilience measures such as a sector's dependence on China for inputs, the labour intensity of its production and its technological proximity to other sectors.

Bonadio et al. (2020) have examined the impact of GVC disruption on GDP. Their study differentiates between foreign and domestic shocks, and it calibrates the likely impact of lockdown measures in 64 countries by simulating what would happen if countries were to be reliant on domestic inputs. Guan and colleagues (2020) use the economic disaster model to assess the supply chain effects of different COVID-19 control measures and they emphasise the indirect impacts on other countries through supply chain linkages.

Hayakawa and Mukunoki (2020) assess the correlation between the number of COVID-19 cases and deaths and rates of bilateral exports and imports of machinery goods (finished and intermediates) between January and June 2020 for 26 reporting and 185 partner countries. Their results indicate that registered COVID-19 cases and deaths in the exporting countries were likely to be a key factor suppressing international trade. Their findings also suggest that COVID-19 did not impact demand for finished machinery products in the importing countries but negatively affected final machinery exports in supplier countries; as a result, supply-side shocks were more significant in the early stages of the pandemic. A substitution effect was witnessed, results showing that a country's exports are positively associated with the pandemic burden borne by its neighbours.

Espitia et al. (2021) use the gravity model to examine how bilateral trade growth may have been impacted by supply and demand shocks during the COVID-19 crisis among exporting, partner and third countries. This study, examining 28 exporting countries and multiple trading partners over a period from the beginning of the pandemic to June 2020, employs DD techniques and relates COVID-19 shocks to sector characteristics. The shocks across sectors are assumed to be heterogeneous and that sector characteristics can address the decline in bilateral export growth induced by the shocks. The regression results, based on a sector-level gravity model, show that negative trade effects induced by the shocks varied widely across sectors and that sectors within which remote working was possible contracted less than those within which it was not. Espitia et al. (2021) also find that while GVC participation increased traders' vulnerability to shocks, it also reduced their exposure to domestic shocks.

Other studies have focused on the implications of COVID-19 for trade in services, foreign direct investment (FDI), tourism and food security. For example, Maliszewska et al. (2020) employ a standard global computable general equilibrium (CGE) model to examine the impact on trade in services by simulating the potential impact of COVID-19 on GDP and trade. Their results show that domestic services and traded tourist services suffer the biggest negative shock. With an open-economy model, Ozge et al. (2020) examine the macroeconomic effects of pandemic-induced shocks on capital flows to emerging market economies. Their study shows output losses in emerging markets and attributes these losses to local currency depreciation, which has a knock-on effect within the developed world.

International organisations have analysed the impact of COVID-19 on developing countries, focusing in particular on how trade in the commodity sectors has been affected (OECD, 2020a, 2020b; UNECLAC, 2020; Escaith et al., 2020).

Within the context of the Commonwealth countries, Ali and colleagues (2020) estimated the impact of pandemic-induced trade disruptions on exports of commodities to China, the USA, the European Union, the United Kingdom and Australia. They predicted that commodity exports to the destination markets would decline by US $98–123 billion in 2020—in percentage terms, an export loss of 19–24 per cent compared to pre-pandemic benchmark estimates.

4. Methodology

We use the gravity model of international trade to assess the impact of the COVID-19 pandemic on bilateral trade flows. In a basic gravity model, trade between country *i* and country *j* is proportional to the size of the economies and inversely relates to the distance—a proxy for transportation costs—between them. Thus it can generally be described as:

$$X_{ij} = A\frac{Y_i Y_j}{D_{ij}}$$

where

- X_{ij} is trade flows or exports from country *i* to country *j*
- Y_i is the GDP of country *i*
- Y_j is the GDP of country *j*
- D_{ij} denotes geographical distance between the two countries (which could be replaced by trade costs proxies).

A commonly used analytical framework, the gravity model has been applied in many empirical studies to estimate the effects of trade policy changes by introducing dummy variables. Among the policies analysed are the effects of free trade agreements (FTAs).

The model in this study introduces the following:

- the number of COVID-19 cases by country and time;
- the number of deaths resulting from the virus; and
- an index that is a proxy for the stringency of virus-containment measures implemented during the pandemic in each country.

After adding the dimension of time and other variables, the first empirical specification of the model is:

$$\begin{aligned} X_{ijt} = \exp(&\beta_1 \ln GDP_{it} + \beta_2 \ln GDP_{jt} \\ &+ \beta_3 \ln COVID_{it} + \beta_4 \ln COVID_{jt} \\ &+ \beta_5 D_{ij} + \beta_6 FTA_{ij} + \beta_7 COL_{ij} \\ &+ \beta_7 BORD_{ij} + \beta_5 LANG_{ij} + \theta_i \\ &+ \pi_j + \gamma_t)\mu_{ijt} \end{aligned} \quad (1)$$

where

- GDP_{it} and GDP_{jt} are the GDPs of countries *i* and *j*, respectively, in period *t*
- $COVID_{it}$ and $COVID_{jt}$ are the number of COVID-19 cases or deaths (or the stringency of containment measures) in the respective countries at time *t*
- D_{ij} denotes the great circle distance between countries *i* and *j*
- FTA_{ij} denotes an FTA dummy variable
- COL_{ij} denotes colonial relationship (either past or present) between the trading countries
- $BORD_{ij}$ denotes a shared border (i.e. neighbouring countries)
- $LANG_{ij}$ denotes that countries have at least one (first or second) language in common
- γ_t indicates time-specific effects (by month) that are common to all trading countries.

Since GDP variables are available for the whole of 2019, we use the origin and destination fixed effects θ_i and π_j, which are a proxy for multilateral resistance factors in equation (1).

The second empirical specification, equation (2), replaces the typical bilateral gravity variables by time-invariant fixed effects, denoted by Φ_{ij}:

$$\begin{aligned} X_{ijt} = \exp(&\beta_1 \ln GDP_{it} + \beta_2 \ln GDP_{jt} \\ &+ \beta_3 \ln COVID_{it} + \beta_4 \ln COVID_{jt} \\ &+ \phi_{ij} + \gamma_t)\mu_{ijt} \end{aligned} \quad (2)$$

Theoretically, the model is based on a constant elasticity substitution (CES) system. Anderson and van Wincoop (2003) used a

non-linear least squares (NLS) model that considers the endogeneity of trade costs to refine the theoretical foundations of the gravity model and provide evidence of border effects in trade. They indicated that the costs of bilateral trade between two countries are affected not only by bilateral trade costs, such as distance, whether or not they are landlocked, a shared border and a common language, but also by the relative weight of trade costs in comparison to those of their trading partners in the rest of the world (the so-called multilateral resistance terms, or MRT).[1] Anderson and van Wincoop (2003) pointed out that these multilateral resistance factors should be taken into account in empirical research to avoid a biased estimation of the model's parameters. Baier and Bergstrand (2007) used country-pair fixed effects in addition to time-varying trade costs to obtain unbiased estimates. According to the most recent developments, a Poisson pseudo maximum likelihood (PPML) approach can be applied if the model is to retain zero trade flows (Head and Mayer, 2014; Yotov et al., 2016).

4.1 Data sources and variables

The main source for bilateral trade flows is monthly data from the UN Comtrade database for January 2019 to November 2020. See Table A.1 for a list of Commonwealth countries.

Health authorities worldwide have collected primary data on COVID-19 on a daily basis. The data on the number of COVID-19 cases, number of deaths and the stringency index is retrieved from Roser and colleagues (2020). Data on GDP in nominal values and population in number of inhabitants is obtained from the World Bank Development Indicators data series. The data on geographical and cultural proximity, such as distance, shared border and common language, is from the Centre d'Etudes Prospectives et d'Informations Internationales (CEPII) database.

Table 1 presents some summary statistics.

4.2 Empirical specification and main results

To examine how COVID-19 may have impacted international trade, we analysed monthly trade data for 186 countries over a period spanning January 2019 to November 2020.

Table 2 presents the main results for the whole sample.

The gravity model has been estimated using PPML: first, with exporter and importer fixed effects (FE) as proxies for the MRT (equation (1)) and with time FE; and, secondly, with bilateral and time FE (equation (2)). The first three columns of Table 2 report the results of equation (1) using PPML and show the estimated coefficient of COVID-19-related and gravity variables. All of the variables are taken with one lag—that is, the previous month—to account for lagged effects.

Table 1. Summary statistics

Variable	Obs	Mean	SD	Min	Max
Trade value (US$)	213380	1.025e+08	7.982e+08	0	4.713e+10
Partner GDP 2019, constant 2010	206439	6.568e+11	2.070e+12	12581	1.830e+13
Reporter GDP 2019, constant 2010	213349	9.698e+11	2.602e+12	18008	1.830e+13
Partner population 2019	207605	55230309	1.784e+08	11646	1.398e+09
Reporter population 2019	206805	59541509	1.838e+08	18008	1.366e+09
Partner new monthly cases	213380	10331.793	93175.493	0	4496410
Partner monthly deaths	213380	291.381	2290.678	0	60750
Partner monthly average stringency	213380	16.473	29.057	0	100
Reporter total monthly cases	213380	19659.207	152796.27	0	2621418
Reporter total monthly deaths	213380	523.002	3368.124	0	60750
Reporter monthly average stringency	213380	15.647	27.556	0	100
Contiguity dummy	213380	.024	.154	0	1
Common language dummy	213380	.134	.341	0	1
Former colony dummy	213380	.022	.148	0	1
Distance between countries	213380	6983.341	4354.057	19.127	19812.043

Table 2. Main results: gravity model estimations with PPML for the whole sample

Dep. var.: export value	(1)	(2)	(3)	(4)	(5)	(6)
Explanatory var.						
Lag-lncovcai	–0.033***			–0.028***		
	(0.005)			(0.005)		
Lag-lncovcaj	–0.002			–0.003		
	(0.003)			(0.003)		
Lag-lncovdei		–0.028***			–0.023***	
		(0.005)			(0.005)	
Lag-lncovdej		–0.003			–0.003	
		(0.004)			(0.005)	
Lag-lnstrini			–0.039***			–0.050***
			(0.014)			(0.013)
Lag-lnstrinj			–0.008			–0.009
			(0.009)			(0.008)
Ind*ij*	–0.621***	–0.620***	–0.619***			
	(0.034)	(0.034)	(0.034)			
Regional trade agreement dummy	0.349***	0.349***	0.350***			
	(0.072)	(0.072)	(0.072)			
Former colony dummy	0.262***	0.262***	0.261***			
	(0.096)	(0.096)	(0.097)			
Contiguity dummy	0.366***	0.367***	0.367***			
	(0.102)	(0.102)	(0.102)			
Common language dummy	0.111	0.111	0.110			
	(0.089)	(0.089)	(0.089)			
Observations	178,120	178,120	178,120	177,137	177,137	177,137
Month FE	Yes	Yes	Yes	Yes	Yes	Yes
i	*j* FE	*j* FE	*j* FE			
Pseudo-R^2	0.923	0.923	0.923	0.991	0.991	0.991
ij FE				Yes	Yes	Yes

Note: Robust standard errors in parentheses; *** p<0.01, ** p<0.05, * p<0.1; H denotes high-income countries.

The coefficients indicate that a 10 per cent increase in the number of COVID-19 cases in the exporter country decreases exports by 0.33 per cent (column (1)). A slightly lower effect is found for the number of deaths in the exporting country (0.028—see column (2)). The effect on exports is not significant, however, when the number of cases or deaths increases in the importer country. The results for the stringency index show that a 10 per cent increase of containment measures' stringency leads to a decrease in exports of about 0.4 per cent (column (3)). The effects remain similar when the gravity variables—namely, distance, FTA, common language and shared border—are replaced by bilateral fixed effects (columns (4)–(6)). All gravity variables present the expected sign and, with the exception of language, all are statistically significant at conventional levels.

We also estimate a log-linearised version of the model with ordinary least squares (OLS) and some variation in the sets of FE included (year versus month). The results, presented in the Appendix (see Table A.2), are similar. The GDP and population variables are included in the traditional gravity model (columns (1) and (2)) and a similar specification with the variable is estimated with PPML for comparison in columns (3) and (4).

Table 3 distinguishes between high-income countries and the other countries. Given that developed countries initiated support

Table 3. Gravity model estimations: heterogeneous effects by income level

Dep. var.: export value	(1)	(2)	(3)
Explanatory var.			
laglncovcai	–0.026***		
	(0.004)		
laglncovcaj	–0.016***		
	(0.003)		
laglncovcaiH	–0.003*		
	(0.002)		
laglncovcajH	0.015***		
	(0.002)		
laglncovdei		–0.020***	
		(0.005)	
laglncovdej		–0.020***	
		(0.004)	
laglncovdeiH		–0.005*	
		(0.003)	
laglncovdejH		0.020***	
		(0.004)	
laglnstrini			–0.045***
			(0.013)
laglnstrinj			–0.041***
			(0.008)
laglnstriniH			–0.017***
			(0.006)
laglnstrinjH			0.041***
			(0.005)
Observations	177,137	177,137	177,137
Month FE	Yes	Yes	Yes
ij FE	Yes	Yes	Yes
Pseudo-R^2	0.991	0.991	0.991

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

mechanisms to help populations to cope with the effects of the pandemic, we expect to find a heterogeneous effect on exports depending on whether the number of cases increases in developed or developing countries. On the import side, we expect the effects of COVID-19 to be stronger for developing countries, whose governments were not always able to financially support their populations in the same way as did most developed economies.

The results show that exports decrease when the number of COVID-19 cases in the importing country increases and that this is especially the case for low-income importing countries. When the importer is a high-income country (laglncovcajH), however, the effect is positive and significant, indicating that countries with higher numbers of COVID-19 cases import more from the rest of the world owing to increased demand from abroad during lockdowns. When we consider the incidence of COVID-19 on the exporters' side, the results are not statistically different for high-income countries and other countries, and are similar to those of Table 2. A comparable pattern is observed when the target variable is the number of COVID-19 deaths (column (2)) or the stringency index (column (3)).

In Table 4, the gravity model is estimated for the Commonwealth exporting (columns (1)–(3)) and importing (columns (4)–(6)) countries separately. As in Table 3, we add the interactions for COVID-19 variables with a dummy variable for high-income Commonwealth countries to acknowledge that the effects can be heterogeneous. The estimates indicate that a high incidence of COVID-19 in the low-income importing countries (laglncovcaj) reduces Commonwealth exports, whereas a high incidence in the high-income importing countries (laglncovcajH) increases Commonwealth exports (see columns (1)–(3)). The number of COVID-19 cases in the exporting countries plays only a minor role, however. When the focus is on Commonwealth imports (columns (4)–(6)), it is important to note that the incidence of COVID-19 in both the exporting and importing countries plays a role.

Table 5 presents similar estimates for intra-Commonwealth trade. The first part of the table present the results of gravity and COVID-19 variables, whereas the second part replaces the gravity variables with time-invariant bilateral FE, as in Table 2, for the whole sample. In general, similar to the results for all countries, the effect

Table 4. Model estimated for Commonwealth exporters and importers

	Commonwealth exporters			Commonwealth exporters		
Dep. var.: trade value	(1)	(2)	(3)	(4)	(5)	(6)
Explanatory var.:						
Laglncovcai	–0.010*			–0.024***		
	(0.006)			(0.009)		
Laglncovcaj	–0.021***			–0.014**		
	(0.006)			(0.006)		
laglncovcaiH	–0.003			–0.013**		
	(0.004)			(0.005)		
laglncovcajH	0.017***			0.029***		
	(0.004)			(0.005)		
Laglncovdei		–0.013**			–0.016*	
		(0.006)			(0.008)	
Laglncovdej		–0.026***			–0.028***	
		(0.006)			(0.006)	
laglncovdeiH		–0.007			–0.019**	
		(0.005)			(0.008)	
laglncovdejH		0.024***			0.038***	
		(0.005)			(0.008)	
Laglnstrini			–0.025*			–0.045***
			(0.013)			(0.014)
Laglnstrinj			–0.033***			–0.050***
			(0.011)			(0.019)
laglnstriniH			–0.007			–0.041***
			(0.011)			(0.012)
laglnstrinjH			0.047***			0.062***
			(0.010)			(0.010)
Observations	41,649	41,649	41,649	38,279	38,279	38,279
Month FE	Yes	Yes	Yes	Yes	Yes	Yes
ij FE	Yes	Yes	Yes	Yes	Yes	Yes
Pseudo-R^2	0.990	0.990	0.990	0.986	0.986	0.986

Note: Robust standard errors in parentheses; *** p<0.01, ** p<0.05, * p<0.1; H denotes high-income countries.

Table 5. Results for intra-Commonwealth trade by developed and developing countries

	Developed CW countries			Developing CW countries		
Dep. var.: trade value	(1)	(2)	(3)	(4)	(5)	(6)
Explanatory var.						
laglncovcai	–0.016			–0.023**		
	(0.014)			(0.010)		
laglncovcaj	–0.018**			–0.016**		
	(0.008)			(0.007)		
laglncovcaiH	–0.006			0.006		
	(0.009)			(0.007)		
laglncovcajH	0.029***			0.033***		
	(0.006)			(0.006)		
laglncovdei		–0.008			–0.022*	
		(0.016)			(0.013)	
laglncovdej		–0.034***			–0.035***	
		(0.010)			(0.010)	
laglncovdeiH		–0.012			0.006	
		(0.015)			(0.010)	
laglncovdejH		0.038***			0.044***	
		(0.009)			(0.009)	
Laglnstrini			–0.031			–0.046
			(0.030)			(0.029)
Laglnstrinj			–0.035			–0.028
			(0.025)			(0.024)
laglnstriniH			–0.008			0.017
			(0.021)			(0.013)
laglnstrinjH			0.069***			0.073***
			(0.014)			(0.013)
Lndij	–0.624***	–0.624***	–0.621***			
	(0.106)	(0.106)	(0.107)			
Regional trade agreement dummy	0.699***	0.699***	0.699***			
	(0.136)	(0.136)	(0.136)			
Former colony dummy	0.612**	0.613**	0.606**			
	(0.295)	(0.295)	(0.295)			
Contiguity dummy	–0.866*	–0.866*	–0.861			
	(0.522)	(0.523)	(0.524)			
Common language dummy	1.994***	1.996***	1.987***			
	(0.385)	(0.386)	(0.386)			
Observations	9,816	9,816	9,816	9,753	9,753	9,753
Month FE	Yes	Yes	Yes	Yes	Yes	Yes
i,j FE				Yes	Yes	Yes
Pseudo-R^2	0.886	0.886	0.886	0.977	0.977	0.977
ij FE				Yes	Yes	Yes

Note: Robust standard errors in parentheses; *** p<0.01, ** p<0.05, * p<0.1; H denotes high-income countries.

of COVID-19 on intra-Commonwealth trade is higher in magnitude, in particular when considering incidence in terms of the number of deaths in the importing countries (cf. 0.02 in Table 3, column (2), vs 0.044 in Table 5, column (5), for high-income countries). The stringency index also presents a different effect for Commonwealth trade: in high-income Commonwealth countries, a higher level of stringency measures increases trade (cf. 0.073 in Table 5, column (6), vs 0.041 in Table 3, column (3)).

For robustness, we analyse the impact of COVID-19 on neighbouring exporting and importing countries in terms of bilateral exports of a given trading pair. The number of cases or deaths in the neighbouring countries, calculated using a distance-weighted sum of COVID-19 burden, is given by:

$$NeighCOVID_{it(jt)} = \sum_{j \neq i} \left(\frac{COVID_{jt(it)}}{Distance_{ij}} \right) \quad (3)$$

where

$COVID_{it(jt)}$ represents the number of cases and number of deaths in country *i(j)*.

The empirical specification of the model, given by equation (1), is augmented with the corresponding variables:

Table 6. Gravity model for COVID-19 incidence in neighbouring countries

Dep. var: trade value	(1)	(2)	(3)
Explanatory var.			
lncovcai	–0.025***		
	(0.003)		
lncovcaj	–0.008**		
	(0.003)		
lnneigcovcait	–0.042*		
	(0.022)		
lnneigcovcajt	–0.131***		
	(0.034)		
lncovdei		–0.026***	
		(0.004)	
lncovdej		–0.010***	
		(0.003)	
lnneigcovdeit		–0.041	
		(0.029)	
lnneigcovdejt		–0.116***	
		(0.029)	
lnstrini			–0.033***
			(0.008)
lnstrinj			–0.026***
			(0.008)
lnneigcovsit			–0.101
			(0.071)
lnneigcovsjt			–0.020
			(0.037)
Constant	21.911***	21.651***	21.496***
	(0.146)	(0.097)	(0.084)
Observations	212,112	212,112	212,112
Month FE	Yes	Yes	Yes
ij FE	Yes	Yes	Yes
r2_p	0.991	0.991	0.991

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

$$X_{ijt} = \exp(\beta_1 \ln GDP_{it} + \beta_2 \ln GDP_{jt} + \beta_3 \ln COVID_{it} + \beta_4 \ln COVID_{jt} + \beta_3 \ln NeighCOVID_{it} + \beta_4 \ln NeighCOVID_{jt} + \beta_5 FTA_{ijt} + \phi_{ij} + \gamma_t)\mu_{ijt} \quad (4)$$

where the definition of variables is that same as that provided under equation (2).

Table 6 presents that an increase in the number of COVID-19 cases in neighbouring importing countries has a negative and significant effect on exports that outweighs the effect on the average importing country (cf. –0.131 vs –0.008) and this is also true for the number of deaths. Lockdowns and other containment measures in neighbouring countries do not, however, exert different impact on exports in comparison to the average importer.

The implications of COVID-19 on overall trade—namely, exports and imports—for specific countries are evaluated with the coefficients obtained from estimates presented in Table 2. Using the predictions of the gravity model, we compared the expected trade with and without COVID-19 cases for the whole period. Table 7 presents a summary of the results of those simulations, which shows negative changes in exports and imports for selected countries. All country-level results can be found in the Appendix (Table A.3). Table A.3 therefore compares the estimates of the model with the number of COVID-19 cases and a counterfactual with zero COVID-19 cases.

In Table A.3, the highest decreases in exports over the period March–November 2020 are observed for the USA (13 per cent), Canada (12.4 per cent) and France (12 per cent); in the case of imports, Namibia (19 per cent), Guyana (16 per cent) and Costa Rica (15 per cent) show the highest negative impact. It is worth mentioning that the time frame included a period (summer 2020) during which some countries' trade recovered slightly, which offset some of the negative impact experienced during the first months of the pandemic.

In addition, countries report bilateral monthly data to the UN Comtrade database only slowly, with the implication that, by January 2021, only 105 countries had reported their monthly trade statistics for January 2020; by the same date, only 50 countries had reported monthly data for November 2020.

The main consequence of this incomplete matrix of monthly trade data is that we are not able to present a forecast for 2021 using econometric methods that require a balanced panel data set. Nonetheless, we can use the coefficients obtained from the gravity models in a partial equilibrium framework to infer what the effects of an increase or decrease in the number of cases and deaths will be for the exports and imports of the countries analysed.

Table 7. Decrease in exports due to COVID-19

% decrease in exports	Commonwealth countries affected	Share of Commonwealth trade	Share of intra-Commonwealth trade
< 10%	Canada, India, Pakistan, South Africa, UK	56.91	40.83
7 – 10%	Australia, Bangladesh, Cameroon, Ghana, Jamaica, Kenya, Nigeria, Singapore, Zambia	29.87	38.44
5 – 7 %	Bahamas, Belize, Botswana, Cyprus, Eswatini, Gambia, Guyana, Malawi, Malaysia, Malta, Mozambique, Namibia, Sri Lanka, Trinidad & Tobago, Uganda	11.87	18.37
Less than 5%	Antigua & Barbuda, Barbados, Brunei Darussalem, Dominica, Fiji, Lesotho, Mauritius, Nauru, Papua New Guinea, Samoa, Seychelles, Tanzania, Tonga, Tuvalu, Vanuatu	1.16	2.12

Source: Model simulations

5. Conclusions and policy implications

This paper uses gravity modelling to examine the link between bilateral trade flows for Commonwealth exports and the impact of COVID-19 on the global and intra-Commonwealth trade in goods. Analysis of data spanning January 2019 to November 2020 suggests that COVID-19 had an adverse impact on trade and that exports decreased as the number of COVID-19 cases rose in an importing country—that is, that high COVID-19 incidence in low-income importing countries reduces Commonwealth exports, whereas high COVID-19 incidence in high-income importing countries increases Commonwealth exports. The incidence of COVID-19 in the exporting country, however, does not impact on trade. For Commonwealth imports, the incidence of COVID-19 in both the exporting and importing countries has an effect. In high-income Commonwealth countries, more stringent measures aiming to contain the virus are associated with increased trade.

The pandemic is ongoing at time of writing, and there is uncertainty about its likely duration and severity across countries and regions. The pandemic has also revealed the vulnerability of Commonwealth countries linked in GVCs, with supply and demand shocks having had a ripple effect. In this context, Friedt and Zhang (2021) suggest that governments' policy response must aim at increasing the resilience of GVCs—that policy-makers must devise measures that protect economies against supply chain shocks and build their resilience. An important point to note is that, to design effective and co-operative policies as part of any recovery initiative within the Commonwealth, co-operation is required at the regional and global levels.

To address the vulnerability of countries linked in GVCs, commodity-dependent Commonwealth countries should consider a set of policies and investments targeting inclusive structural transformation and aiming to diversify the economy. At the same time, commodity-dependent countries should consider adopting policy frameworks and measures that support a sustainable recovery post-COVID-19 and which build resilience against future shocks.

Short-term measures to overcome the challenges of COVID-19 can be linked to economic growth by investing in productivity and policies aiming to enhance the resilience of Commonwealth countries. Appropriate planning is required to minimise the impact on sectors linked in GVCs. A roadmap will help countries to achieve their short-, medium- and long-term goals and to revitalise their economies by taking into account the specific conditions and needs of those sectors adversely affected. In the short term, governments should focus on the immediate health crisis, on ensuring food and nutritional security, on job creation and on supporting the economy to ensure that there is no long-term scarring from the pandemic.

In the medium term, Commonwealth countries' focus should be on boosting bounce-back activities that will transform the recovering economy by promoting the long-term sustainable growth of international trade. For example, regional co-operation might be one way of achieving an inclusive structural transformation. An important driver for co-operation in Africa might be the African Continental Free Trade Area (ACFTA), which can add value and support diversification, especially by means of participation in regional value chains.

Finally, in light of their growing participation in world trade, Commonwealth countries might find in the current situation a unique opportunity to use new technologies to support policies targeting recovery. The use of new technologies, such as additive manufacturing, will prompt a restructuring of GVCs and may mitigate risks by means of a combination of diversification strategies. It is also possible, however, that automation will fuel production reshuffling that shifts nations' incentives and yields a redistribution of manufacturing around the globe.

To conclude, while Commonwealth countries will focus in the short term on remedying the adverse impacts of the pandemic and restoring jobs and employment, their long-term focus may be on improving productivity and boosting their resilience by investing in a balanced portfolio of physical, human, social and natural capitals.

For example, countries may choose to invest in health, education, skills development, innovation, technological upgrading, and green infrastructure and natural capital, thereby increasing the productive capacity of the population and providing sustainable returns for future generations. In this way, Commonwealth countries may build capacity to deal with future challenges and mitigate the impact of future crises, including pandemics, and other socio-economic shocks.

Notes

1 Anderson and van Wincoop (2003) derived the gravity equation in a cross-sectional model as follows:

$$x_{ij} = \frac{y_i y_j}{y^W}\left(\frac{t_{ij}}{P_i P_j}\right)^{1-\sigma}$$

where
x_{ij} refers to exports from country i to country j
y_i and y_j are the nominal income of countries i and j
$y^W \equiv \sum_{jyj}$ denotes world nominal income
t_{ij} is the trade cost factor between countries i and j
σ is the elasticity of substitution between all goods
P_i and P_j measure the trade barriers of countries i and j in exports and imports, i.e. outward and inward multilateral trade resistance.

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Annex

Table A.1 List of Commonwealth countries included in the analysis

Partner countries	Reporter countries
Antigua and Barbuda	Antigua and Barbuda
Australia	Australia
Bahamas	Barbados
Bangladesh	Belize
Barbados	Botswana
Belize	Canada
Botswana	Cyprus
Brunei Darussalam	Eswatini
Cameroon	Ghana
Canada	Guyana
Cyprus	India
Dominica	Kenya
Eswatini	Malaysia
Fiji	Malta
Ghana	Mauritius
Guyana	Namibia
India	New Zealand
Jamaica	Pakistan
Kenya	Rwanda
Kiribati	Seychelles
Lesotho	Singapore
Malawi	South Africa
Malaysia	Uganda
Malta	United Kingdom
Mauritius	Zambia
Mozambique	
Namibia	
Nauru	
New Zealand	
Nigeria	
Pakistan	
Papua New Guinea	
Rwanda	
Samoa	
Seychelles	
Sierra Leone	
Singapore	
South Africa	
Sri Lanka	
Tanzania, United Republic of	
Tonga	
Trinidad and Tobago	
Tuvalu	
Uganda	
United Kingdom	
Vanuatu	
Zambia	

Source: UN Comtrade.

Table A.2 Comparing linear models estimated with OLS and exponential mean models with PPML

	(1)	(2)	(3)	(4)
Dep. var.	lnx_{ij}	lnx_{ij}	Trade value	Trade value
Method	OLS–YFE	OLS_MFE	PPML_YFE	PPMP_MFE
lnyi	1.350***	1.352***	0.791***	0.793***
	(0.014)	(0.014)	(0.008)	(0.008)
lnyj	0.916***	0.917***	0.591***	0.598***
	(0.015)	(0.015)	(0.025)	(0.025)
lnpopi	–0.161***	–0.160***	–	–
	(0.017)	(0.017)		
lnpopj	0.063***	0.066***	–	–
	(0.018)	(0.018)		
lndij	–1.000***	–1.002***	–0.409***	–0.409***
	(0.023)	(0.023)	(0.016)	(0.016)
Regional trade agreement dummy	0.878***	0.879***	0.100***	0.100***
	(0.043)	(0.043)	(0.021)	(0.021)
Former colony dummy	0.592***	0.594***	–0.055**	–0.053**
	(0.104)	(0.104)	(0.026)	(0.026)
Contiguity dummy	0.951***	0.947***	0.961***	0.961***
	(0.123)	(0.123)	(0.056)	(0.056)
Common language dummy	0.628***	0.626***	0.157***	0.157***
	(0.060)	(0.060)	(0.039)	(0.039)
lncovcai	–0.027***	–0.033***	–0.059***	–0.070***
	(0.005)	(0.006)	(0.010)	(0.013)
lncovcaj	0.016***	0.006	0.048***	0.025
	(0.004)	(0.006)	(0.012)	(0.022)
Period=2019/02		–0.113***		–0.085
		(0.019)		(0.067)
Period=2019/03		–0.054***		0.012
		(0.020)		(0.068)
Period=2019/04		–0.017		–0.007
		(0.021)		(0.069)
Period=2019/05		0.033		0.031
		(0.021)		(0.070)
Period=2019/06		–0.092***		–0.044
		(0.021)		(0.072)
Period=2019/07		–0.010		0.027
		(0.021)		(0.071)
Period=2019/08		–0.079***		–0.048
		(0.021)		(0.074)
Period=2019/09		–0.102***		–0.022
		(0.021)		(0.072)
Period=2019/10		–0.002		0.043
		(0.021)		(0.070)
Period=2019/11		–0.092***		–0.025
		(0.021)		(0.071)

(*Continued*)

Table A.2 Comparing linear models estimated with OLS and exponential mean models with PPML (*Continued*)

	(1)	(2)	(3)	(4)
Dep. var.	lnxij	lnxij	Trade value	Trade value
Method	OLS–YFE	OLS_MFE	PPML_YFE	PPMP_MFE
Period=2019/12		–0.113***		–0.052
		(0.022)		(0.071)
Period=2020/01		–0.088***		0.067
		(0.024)		(0.074)
Period=2020/02		–0.167***		0.053
		(0.028)		(0.094)
Period=2020/03		0.028		0.346
		(0.069)		(0.256)
Period=2020/04		–0.129		0.177
		(0.080)		(0.292)
Period=2020/05		–0.090		0.171
		(0.076)		(0.276)
Period=2020/06		–0.048		0.301
		(0.078)		(0.266)
Period=2020/07		0.011		0.412
		(0.081)		(0.278)
Period=2020/08		0.025		0.414
		(0.085)		(0.295)
Period=2020/09		0.146		0.552*
		(0.089)		(0.316)
Period=2020/10		0.191**		0.678*
		(0.097)		(0.353)
Period=2020/11		0.473***		0.241
		(0.152)		(0.325)
Year=2020	–0.077***		0.031	
	(0.020)		(0.044)	
Observations	194,812	194,812	206,410	206,410
R_2/R_2-Overall/P_s-R_2	0.649	0.650	0.710	0.711
Year FE	Yes		Yes	
Month FE		Yes		Yes
Number of id				

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

Table A.3. Decrease in exports and imports owing to COVID-19

Exporter	%	Importer	%
Afghanistan	8.4	Antigua and Barbuda	10.31
Albania	7.7	Armenia	11.72
Algeria	8.8	Australia	4.57
Angola	6.5	Azerbaijan	11.70
Antigua and Barbuda	4.2	Barbados	14.43
Argentina	9.5	Belarus	11.94
Armenia	8.5	Belgium	9.58
Aruba	2.0	Belize	11.89
Australia	8.4	Brazil	4.27
Austria	9.3	Bulgaria	10.31
Azerbaijan	8.0	Canada	14.42
Bahamas	6.7	Chile	0.42
Bahrain	9.6	Colombia	2.76
Bangladesh	9.4	Costa Rica	15.21
Barbados	4.7	Croatia	10.21
Belarus	8.4	Cyprus	7.58
Belgium	9.8	Czech Republic	11.96
Belize	5.3	Denmark	11.92
Benin	6.1	Ecuador	12.20
Bermuda	2.0	Egypt	9.21
Bhutan	4.4	El Salvador	13.71
Bolivia	8.4	Estonia	11.86
Bosnia and Herzegovina	8.3	Finland	10.28
Botswana	6.0	Georgia	8.88
Brazil	11.6	Germany	10.73
Brunei Darussalam	2.7	Greece	10.61
Bulgaria	7.9	Guatemala	12.69
Burkina Faso	6.5	Guyana	16.19
Burundi	4.6	Hong Kong, China	9.71
Cabo Verde	7.4	Hungary	10.13
Cambodia	3.8	Iceland	11.50
Cameroon	7.9	India	11.85
Canada	12.4	Ireland	10.64
Central African Republic	5.5	Israel	10.84
Chad	5.9	Italy	10.80
Chile	10.2	Japan	8.10
China	9.1	Kyrgyzstan	10.12
Colombia	11.0	Latvia	11.38
Comoros	4.5	Lithuania	11.55
Congo	6.6	Luxembourg	11.85
Costa Rica	9.3	Macedonia, North	11.66
Côte d'Ivoire	7.8	Madagascar	2.80
Croatia	8.2	Mauritius	9.58
Cuba	6.7	Mexico	13.31
Cyprus	6.1	Moldova, Republic of	10.49

(*Continued*)

Table A.3. Decrease in exports and imports owing to COVID-19 (*Continued*)

Exporter	%	Importer	%
Czech Republic	9.0	Morocco	0.93
Denmark	8.7	Namibia	18.69
Djibouti	6.7	Netherlands	12.42
Dominica	3.2	New Zealand	11.62
Dominican Republic	10.3	Norway	9.13
Ecuador	9.7	Pakistan	11.81
Egypt	8.9	Paraguay	9.97
El Salvador	8.6	Peru	4.35
Equatorial Guinea	6.8	Philippines	9.63
Eritrea	5.3	Poland	6.71
Estonia	6.6	Portugal	12.24
Eswatini	6.5	Romania	10.57
Ethiopia	8.1	Rwanda	5.25
Fiji	2.7	Senegal	0.43
Finland	7.7	Slovakia	9.82
France	12.0	Slovenia	10.11
Gabon	6.8	South Africa	11.93
Gambia	5.6	Spain	11.13
Georgia	6.7	Sweden	11.89
Germany	11.1	Switzerland	13.62
Ghana	8.4	Turkey	4.27
Greece	7.8	Ukraine	14.90
Guatemala	9.6	United Kingdom	12.08
Guinea	7.5	USA	12.43
Guinea-Bissau	5.6	Zambia	11.40
Guyana	6.6	Zimbabwe	1.07
Haiti	7.3		
Honduras	9.7		
Hong Kong, China	1.6		
Hungary	7.8		
Iceland	6.4		
India	11.4		
Indonesia	8.9		
Iran, Islamic Rep	10.8		
Iraq	9.8		
Ireland	8.9		
Israel	10.1		
Italy	11.2		
Jamaica	7.5		
Japan	9.6		
Jordan	7.2		
Kazakhstan	8.6		
Kenya	8.1		
Kiribati	1.7		
Korea, Democratic Republic of	1.4		

(*Continued*)

Table A.3. Decrease in exports and imports owing to COVID-19 (*Continued*)

Exporter	%	Importer	%
Korea, Republic	9.3		
Kuwait	9.4		
Kyrgyzstan	7.2		
Lao People's Democratic Republic	2.2		
Latvia	6.2		
Lebanon	8.0		
Lesotho	4.8		
Liberia	5.5		
Libya, State of	6.5		
Lithuania	6.9		
Luxembourg	6.7		
Macedonia, North	8.1		
Madagascar	7.1		
Malawi	6.0		
Malaysia	6.7		
Mali	6.5		
Malta	6.6		
Mauritania	6.3		
Mauritius	4.2		
Mexico	11.9		
Micronesia, Federation of	1.8		
Moldova, Republic	8.5		
Mongolia	4.3		
Morocco	9.4		
Mozambique	6.6		
Myanmar	6.0		
Namibia	6.3		
Nauru	1.8		
Nepal	8.3		
Netherlands	9.9		
New Zealand	5.4		
Nicaragua	6.8		
Niger	5.4		
Nigeria	8.6		
Norway	8.3		
Oman	9.1		
Pakistan	10.2		
Panama	10.0		
Papua New Guinea	3.8		
Paraguay	7.3		
Peru	10.8		
Philippines	9.6		
Poland	9.7		
Portugal	9.5		
Qatar	9.2		

(*Continued*)

Table A.3. Decrease in exports and imports owing to COVID-19 (*Continued*)

Exporter	%	Importer	%
Romania	9.6		
Russian Federation	11.5		
Rwanda	6.8		
Samoa	1.6		
São Tomé and Príncipe	4.9		
Saudi Arabia	9.8		
Senegal	7.8		
Seychelles	3.6		
Sierra Leone	5.9		
Singapore	9.0		
Slovakia	7.3		
Slovenia	7.1		
Somalia	6.2		
South Africa	10.1		
Spain	11.4		
Sri Lanka	6.7		
Sudan	6.7		
Suriname	6.2		
Sweden	9.8		
Switzerland	9.0		
Syrian Arab Republic	5.8		
Tajikistan	6.2		
Tanzania, United Republic of	2.8		
Thailand	6.4		
Togo	6.2		
Tonga	1.6		
Trinidad and Tobago	6.0		
Tunisia	7.2		
Turkey	10.4		
Turkmenistan	1.6		
Tuvalu	1.2		
Uganda	6.9		
Ukraine	9.3		
United Arab Emirates	9.6		
United Kingdom	10.6		
USA	13.4		
Uruguay	5.8		
Uzbekistan	8.3		
Vanuatu	1.6		
Venezuela, Boliviarian Republic of	8.6		
Viet Nam	5.5		
Yemen	5.1		
Zambia	7.3		
Zimbabwe	6.5		