The current issue and full text archive of this journal is available on Emerald Insight at:
https://www.emerald.com/insight/1746-8809.htm

Impacts of the COVID-19 pandemic on international trade in developing countries: evidence from Vietnam

Chung Van Dong
Institute of World Economies and Politics, Vietnam Academy of Social Sciences, Hanoi, Viet Nam and
Department of Economics, National Dong Hwa University, Hualien, Taiwan, and
Hoan Quang Truong
Institute for Southeast Asian Studies, Vietnam Academy of Social Sciences, Hanoi, Viet Nam

Received 10 September 2021
Revised 6 February 2022
7 May 2022
1 July 2022
Accepted 13 August 2022

Abstract

Purpose – The coronavirus disease (COVID-19) pandemic has been negatively affecting international trade between countries; however, there is a lack of empirical studies on developing countries such as Vietnam. This article aims to investigate how the COVID-19 cases and related deaths and policy response by Vietnam and trading partners to the pandemic affect Vietnam's export activities.

Design/methodology/approach – The authors use the monthly trade data from the General Department of Vietnam Customs and employ the Poisson pseudo-maximum-likelihood (PPML) estimator to empirically investigate the effects of COVID-19 and policy response to the pandemic on Vietnam's exports at aggregate and sectoral levels over a 33-month period.

Findings – In the first year of the pandemic (January–December 2020) as well as the whole study period (January 2019–September 2021), trading partners' COVID-19 burden adversely affected Vietnam's aggregate exports, and the effect of COVID-19 deaths is significantly larger than that of COVID-19 cases. In the first year of the pandemic, estimates show a negative effect of Vietnam's COVID-19 cases on its exports, while no evidence reveals the impact of Vietnam's COVID-19 deaths. However, during the entire study period, there are remarkable adverse effects of Vietnam's COVID-19 deaths on its exports. The effect of the COVID-19 burden in Vietnam and in its trading partners differs significantly across major subsectors. In the first year, there is a positive role of government response to the pandemic by Vietnam and its trading partners in Vietnam's aggregate exports, while in the whole study period, only a positive effect of Vietnam's government response is found. Economic support and free trade agreements (FTAs) have a positive effect on Vietnam's exports. In the first year of the pandemic, Vietnam's export losses due to COVID-19 outweighed its export gains from the pandemic. However, Vietnam's exports have significantly improved over the nine months of 2021.

Research limitations/implications – Efforts should aim to reduce the number of COVID-19 deaths rather than focus on reducing the number of COVID-19 cases. The application of stringency measures by both exporters and importers should be minimized, or at least those measures need to be combined with health methods, such as testing policy and contact tracing, short-term investment in healthcare and especially investments in vaccines. In addition, economic support, particularly debt relief, needs to be widely applied to assist firms, especially those involved in international trade. The expansion of FTA networks and diversifying export destinations may be helpful in maintaining production networks and export activities.

Chung Van Dong and Hoan Quang Truong have contributed equally to this manuscript. We would like to thank reviewers and editors for their constructive comments and suggestions to improve the quality of the manuscript.

Funding: This research did not receive any specific grant from funding agencies in the public, commercial or not-for-profit sectors.

Disclosure statement: The manuscript is original. It has not been published elsewhere in the form of an article, and it has not been submitted simultaneously for publication elsewhere. There are no conflicts of interest to disclose.

International Journal of Emerging Markets
Vol. 19 No. 5, 2024
pp. 1113-1134
© Emerald Publishing Limited
1746-8809
DOI 10.1108/IJOEM-09-2021-1395

Downloaded from http://www.emerald.com/ijoem/article-pdf/19/5/1113/9529762/ijoem-09-2021-1395.pdf by Hebrew University of Jerusalem user

Practical implications – In the long-term period, the application of stringency measures by both exporters and importers should be minimized, or at least those measures need to be combined with health methods such as testing policy and contact tracing, short-term investment in healthcare and especially investments in vaccines. In addition, economic assistance, particularly debt relief, needs to be widely applied to assist firms, especially those involved in international trade activities.
Originality/value – To the best of the authors' knowledge, the paper is among the first studies empirically investigating the impacts of COVID-19 and policy response to the pandemic on aggregate and sectoral exports from Vietnam. The paper also measures the absolute value of export gain and export loss due to the pandemic between Vietnam and trading countries.

Keywords Impacts, COVID-19, Vietnam, Exports
Paper type Research paper

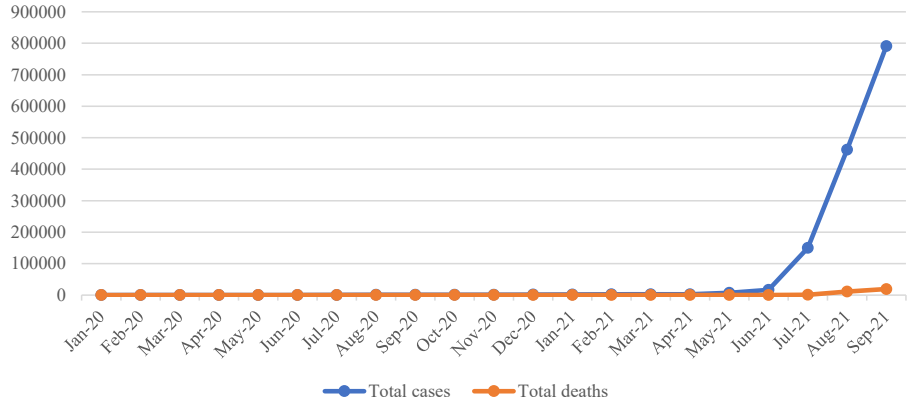
1. Introduction

The coronavirus disease (COVID-19) pandemic has had serious economic consequences as well as has posed great challenges to the economic integration of East and Southeast Asia. As noted by works of ERIA (2020), Kimura (2020) and Kimura *et al.* (2020), the likely economic impacts of the pandemic on the regional economy are via channels such as the disruption of supply chain performance; a sharp drop in global consumer demand from the large negative wealth effects; the disruption of growth in connectivity – the key factor of a stronger global value chain (GVC); an increase in GVCs' operation cost due to the limited supply of services and the application of restrictive non-tariff measures; and the financial fragility due to large negative wealth effects from unemployment and large corporate bankruptcies globally. For the Association of Southeast Asian Nations (ASEAN) region, the effects of COVID-19 are deeply heating its member economies at a time when other risk factors, such as the global growth slowdown and the trade war between the United States and China, were already rising (Menon, 2020).

Focusing more on international trade, the COVID-19 burden (number of cases and related deaths) can substantially affect global trade patterns in several ways. First, a higher COVID-19 burden in an exporting country might result in a decrease in the scale of production, leading to a decline in export supply. Second factor is the effect of the COVID-19 burden on importing countries. This is mainly due to a decrease in aggregate demand in importing countries when people reduce visits to markets or might lose income and purposely save money for future risks (Baldwin and Tomiura, 2020). Third, the international trade of one country may be affected by the COVID-19 burden in neighboring countries. Clearly, dampening exports from an affected country may create an export opportunity for its neighbors. Furthermore, negative production shocks due to COVID-19 in a country may reduce production in neighboring countries through supply chain networks (Hayakawa and Mukunoki, 2020). Fernandes (2020) suggests that supply chain disruption caused by the COVID-19 pandemic and the sharp decline in global trade put further pressure on countries that are highly dependent on foreign trade. Gruszczynski (2020) investigates impacts of the COVID-19 pandemic on international trade in the short- and long-term periods. Accordingly, a decline can be expected in the short term, while in the long term, firms will behave as usual, but with some structural changes as they adjust their activities in the process of economic globalization.

As a developing economy with a high dependence on international trade and foreign direct investment (FDI), Vietnam is believed to be negatively impacted by the viral pandemic. The textile, garment and footwear industries in Vietnam, which are deeply integrated into GVCs, have been severely disrupted. A survey conducted in May 2020 by the General Statistics Office of Vietnam (GSO) revealed that 86% of 126,000 firms were considerably affected by the pandemic (Vo, 2020). In 2020, Vietnam had relatively efficiently controlled the spread of the COVID-19 pandemic, with 1,565 reported cases and 25 deaths. In 2020, Vietnam was among the first countries in the world to domestically reopen its society and economy, including the tourism sector, and resuming normal industrial production. However, Vietnam has recently faced new waves of COVID-19 variants. Figure 1 shows that at the end of September 2021,

Downloaded from http://www.emerald.com/ijoem/article-pdf/19/5/1113/9529762/ijoem-09-2021-1395.pdf by Hebrew University of Jerusalem user

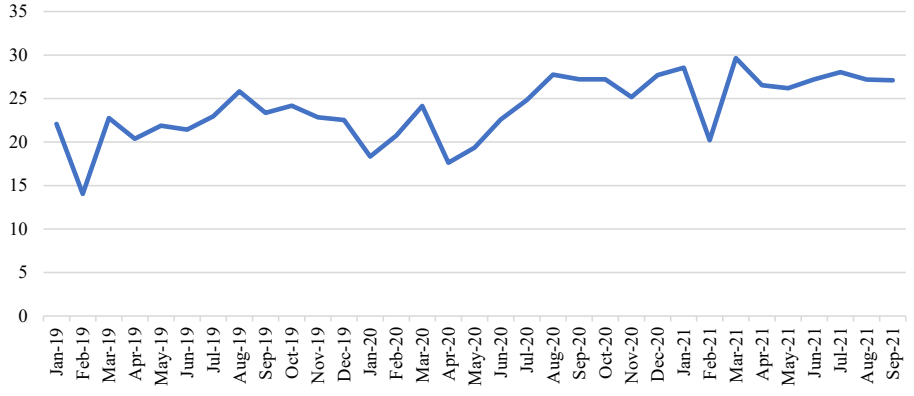


Source(s): Author's processing from Data on COVID-19 by Our World in Data, https://github.com/owid/covid-19-data/tree/master/public/data#data-on-covid-19-coronavirus-by-our-world-in-data, accesses 20 January 2022

Figure 1.
Total Number of COVID-19 cases and deaths in Vietnam (January 2020–September 2021)

Vietnam had nearly 800,000 COVID-19 cases and nearly 20,000 COVID-19 deaths, which has brought serious challenges to its socioeconomic development.

In response to the pandemic, Vietnam has provided stimulus packages to accelerate economic recovery including disbursement of cash assistance to retrenched workers and vulnerable groups, assistance to enterprises and strengthening emergency health responses such as testing capacity and vaccination programs. Despite fluctuations, figures from the General Department of Vietnam Customs show that Vietnam's commodity exports to the world in 2020 reached US$282.65 billion, which was 7.0% higher than the export value in 2019. Vietnam's exports in the first quarter of 2021 are 23.7% higher than that in the same period of 2020. Subsequently, when the number of COVID-19 cases and deaths increased rapidly, Vietnam's exports fluctuated significantly (see Figure 2). In terms of export structure, Vietnam's exports in 2020 had focused on telephones and components (US$51.18 billion),



Source(s): Author's processing from General Department of Vietnam Customs

Figure 2.
Vietnam's exports to the world (January 2019–September 2021, US$ billions)

Downloaded from http://www.emerald.com/ijoem/article-pdf/19/5/1113/9529762/ijoem-09-2021-1395.pdf by Hebrew University of Jerusalem user

computer and electronic products (US$44.58 billion), textile and garment products (US$29.81 billion) and machinery and equipment products (US$27.19 billion). The most important markets for Vietnam's exports in 2020 were the United States, China, Japan and South Korea. Therefore, to some extent, it could be said that Vietnam is now ready to become a regional economic hub that can partly replace China in the global supply chain in selected sectors. Given this context, there are emerging and interesting questions: What are the effects of the COVID-19 pandemic on Vietnam's international trade? How did the COVID-19 pandemic affect Vietnam's exports in major industries? How do Vietnam's and trading partners' policy responses to the COVID-19 pandemic affect Vietnam's international trade?.

Our current paper, by using the monthly trade data from the General Department of Vietnam Customs and employing the Poisson pseudo-maximum-likelihood (PPML) estimator, aims to empirically investigate the effects of COVID-19 and other relevant factors on Vietnam's export activities. We first estimated the impact of COVID-19 on Vietnam's aggregate and sectoral exports for the first year of the pandemic, 2020. We compared exports in 2020 with those in 2019 to understand how COVID-19 changed the pattern of Vietnam's exports to trading partners in the first year of the pandemic. Next, we examined the impact of COVID-19 on Vietnam's aggregate and sectoral exports for the entire study period (January 2019–September 2021). We also compared the export change in the nine months of 2021 and 2020, with the same period of 2019, to have a more comprehensive evaluation on the effect of COVID-19 on Vietnam's exports. The current research potentially contributes to the literature in several ways. First, to the best of our knowledge, this study is among the first to empirically investigate the impact of COVID-19 on aggregate and sectoral exports from Vietnam. Second, we measure the absolute value of export gain and export loss due to the pandemic between Vietnam and its trading countries. Third, few studies have explored the effects of Vietnam and trading partners' policy responses to the pandemic on Vietnam's international trade. From empirical evidence, this study provides suggestions for fostering Vietnam's international trade in the future.

The remainder of this paper is organized as follows. Section 2 reviews literature on COVID-19 and its impact on trade. Section 3 analyzes the data sources and the methodology. Section 4 presents the estimation results and discussion. Section 5 summarizes the key findings and draws several policy implications.

2. Literature review

Recent studies have shown that the COVID-19 pandemic has had significantly negative impacts on various aspects of the economy and social system on an individual, regional or world levels (Atkeson, 2020; Baker *et al.*, 2020; Brewer and Gardiner, 2020; Courtemanche *et al.*, 2020; Dev and Sengupta, 2020; Eppinger *et al.*, 2020; Niewiadomski, 2020; Norouzi *et al.*, 2020; Petri and Plummer, 2020; Sumner *et al.*, 2020; Suryahadi *et al.*, 2020). In line with this trend, many studies have focused on the impacts of the COVID-19 pandemic on international trade and GVC issues at the national, regional and global levels.

At regional and global levels, Hayakawa and Mukunoki (2020) examined impacts of the COVID-19 burden (number of cases and deaths) on international trade in 186 countries in the first quarter of 2020. They found that the COVID-19 burden in exporting countries has negative effects on trade; on the contrary, the COVID-19 burden in an exporter's neighboring countries has a positive impact on their exports. They find heterogeneous effects across subsectors (negative impacts on nonessential products and positive impacts on industries providing medical products).

Bekkers and Koopman (2020) employ the global trade model and data from the Global Trade Analysis Project (GTAP) to project the COVID-19 effect on the global economy. Their findings show that trade is projected to decline by 8% in the V-shaped (optimistic) scenario

Downloaded from http://www.emerald.com/ijoem/article-pdf/19/5/1113/9529762/ijoem-09-2021-1395.pdf by Hebrew University of Jerusalem user

and 20% in the L-shaped (pessimistic) scenario. Vidya and Prabheesh (2020) adopt trade network analysis and artificial neural networks to estimate trade interconnectedness among 15 global trading countries before and after the COVID-19 outbreak and forecast the future direction of trade. Estimates show that there is a drastic reduction in trade interconnectedness, connectivity and density among countries after the COVID-19 outbreak; nevertheless, China's central position in the trade network is not influenced by the pandemic.

Using data from January to June 2020 for 26 reporting and 185 partner countries, Hayakawa and Mukunoki (2021) assessed the impact of the number of COVID-19 cases and deaths on the bilateral export and import growth of machinery goods. They demonstrate that COVID-19 does not have a significant demand effect in importing countries but that COVID-19 shocks in supplier countries negatively affect exporters' final machinery exports. The estimation indicates that exporting countries' COVID-19 cases and deaths also hurt their exports of finished machinery products, but to a lesser extent.

Kejzar and Velic (2020) use a gravity model framework to highlight the role of chain-forward linkages in the transmission of COVID-19 demand shocks in European Union (EU) countries. They find that forward GVC linkages act as a channel for the transmission of (demand) shocks in the supply chain trade. Similarly, Espitia *et al.* (2021) used monthly disaggregated trade data for 28 EU countries and multiple trading partners from the beginning of the pandemic to June 2020 to examine the influence of COVID-19 on trade. The estimated results from the gravity model indicate that the negative trade effects induced by the COVID-19 shocks largely differ across sectors. The research finds that participation in GVCs increases traders' vulnerability to shocks suffered by trading partners, but also reduces their vulnerability to domestic shocks.

Barbero *et al.* (2021) examine the impact of COVID-19 on bilateral trade flows in 68 exporting countries between January 2019 and October 2020. They find a greater negative effect of the COVID-19 burden on bilateral trade for those economies participating in regional trade agreements before the pandemic. In addition, they find a negative impact of COVID-19 on trade flows when considering indicators related to governmental actions.

Focusing on specific countries, Zhao *et al.* (2021) explored the impact of the COVID-19 pandemic on China's exports to 21 trading partner countries (regions) from January 2019 to August 2020. They find that the COVID-19 pandemic in China negatively affects its exports, while the COVID-19 pandemic situation in trading partner countries and regions has positive impacts on China's total exports. Liu *et al.* (2021) found that a country's own COVID-19 deaths and lockdowns significantly reduce its imports from China, indicating that the negative demand effects prevail over the negative supply effects of the pandemic. Meanwhile, COVID-19 deaths in the main trading partners of a country (excluding China) induce more imports from China, partially offsetting the country's own effects. On the other hand, Zhang *et al.* (2022) investigated the impact of the COVID-19 pandemic on the trading behavior of the United States and China. They find a direct causal relationship between COVID-19-related deaths and the exports and imports of China, while the COVID-19 cases do not have a causal relationship with the exports and imports of China.

Davidescu *et al.* (2022) analyzed the capacity of Romanian exports to regain the ascending trend displayed before the COVID-19 pandemic by employing simulation forecasting scenarios based on the shape of the economic recovery and the type of shock transmission across countries. The estimation shows a sharp decline in Romanian exports in 2020, followed by a significant recovery in 2021 in a V-shaped scenario, and uniform transmission of the pandemic shock in domestic demand and external trade. Another possible scenario is the very slow recovery of Romanian exports in 2021, especially when global relations with the rest of the world are included. Using monthly data at the product, region and firm levels, Minondo (2021) analyzed the impact of COVID-19 on the trade of goods and services in Spain.

Downloaded from http://www.emerald.com/ijoem/article-pdf/19/5/1113/9529762/ijoem-09-2021-1395.pdf by Hebrew University of Jerusalem user

This study finds that the COVID-19 pandemic and containment measures have led to a sharp decline in the Spanish trade of goods and services, particularly in transport equipment, capital goods, products that are consumed outdoors and tourism.

Despite an increasing number of studies, few empirical studies have investigated the effect of COVID-19 on international trade in relatively small, developing economies, such as Vietnam. In particular, our knowledge of the effect of the government's response to the pandemic, as well as other relevant factors, on international trade in these countries is still limited and inconsistent. In addition, several studies have examined the COVID-19 impact on Vietnam's socioeconomic aspects (Dao and Gan, 2021; Nguyen *et al.*, 2021; Morisset, 2020; Lai, 2021; Le *et al.*, 2021; Nguyen and Dinh, 2021), but few have quantitatively examined the effects of the pandemic on Vietnam's aggerate and sectoral exports. Thus, our study attempts to fill this gap by empirically investigating the impact of the COVID-19 burden and other relevant factors on Vietnam's exports. We also investigate the impacts of the COVID-19 and the policy response to the pandemic by Vietnam and trading partners on Vietnam's aggregate and sectoral exports.

3. Data and methodology

3.1 Data and variables

The data used in the current study were collected monthly, covering a 33-month period from the first quarter of 2019 to the third quarter of 2021.

Figures for export value at both the aggregate and sectoral levels are gathered from monthly trade data reports operated by the General Department of Vietnam Customs of Vietnam. Due to the data availability of monthly trade at sectoral level, we only include 30 importers in the estimation. To explore the impact of COVID-19 on Vietnamese exports in the first year of 2020, we use the two time periods – January–December 2019 and January–December 2020 – while the first nine months of 2021 are incorporated to estimate the impacts of COVID-19 on the exports of Vietnam only.

Data on the GDP of Vietnam and its trading partners are taken monthly from the Main Economic Indicators of the Organisation for Economic Co-operation and Development (OECD) and from the World Economic Outlook by the International Monetary Fund (IMF). We aim to research the effects of COVID-19 on Vietnamese exports; therefore, the inclusion of GDP in the model plays a role in the production capacity of the country. Free trade agreement (FTA) is a dummy variable that denotes engagement in bilateral trade agreements between Vietnam and importing partners. Data for FTA are collected from the World Trade Organization (WTO) and the WTO Centre of the Vietnam Chamber of Commerce and Industry (VCCI).

Data on COVID-19 cases and deaths in Vietnam and its partners were collected from "Our World in Data" (https://github.com/owid/covid-19-data/tree/master/public/data#data-on-covid-19-coronavirus-by-our-world-in-data). Data on COVID-19 are collected daily, so we generate variable COVID-19 burden as total cumulated cases at the end of each month. To avoid the problem of zero COVID-19 cases in estimating the log-formed equation, we combined COVID-19 burden variables with one. Similarly, the COVID-19 burden in 2019 was added to one. These COVID-19 variables are estimated and interpreted as the impact of COVID-19 on Vietnam's exports. It is quite obvious that COVID-19 burden impedes trade activity and is predicted to have negative effects on trade flows.

It is rational to demonstrate that including the income level of importers is crucial and can capture more of the effect behind the scene. This is because a country with a higher income may be negatively affected by less than a country with a lower income. In addition, most developed countries have more advanced healthcare systems than developing countries do. As a result, COVID-19 may hurt lower-income countries more than higher-income countries.

Downloaded from http://www.emerald.com/ijoem/article-pdf/19/5/1113/9529762/ijoem-09-2021-1395.pdf by Hebrew University of Jerusalem user

We insert the income level of importers in estimation to control for the above-mentioned issues. The income level data are classified and obtained from the World Bank.

Data on the policy responses of Vietnam and its trading partners to the COVID-19 pandemic are obtained from the Oxford COVID-19 Government Response Tracker database. In the first stage, containing-related policies limit bilateral trade, whereas relaxing-associated responses are generally used to restore trade flows. Table 1 presents the summary of the variables in the model.

3.2 Econometric specification

To investigate the effects of the COVID-19 burden on Vietnam's international trade, we included COVID-19 cases and deaths as well as policy responses in a specific logged form as follows:

$$export_{ijt} = \alpha_0 + \alpha_1 gdp_{it} + \alpha_2 gdp_{jt} + \alpha_3 FTA_{ijt} + \alpha_4 covidbur_{it} + \alpha_5 covidbur_{jt} + X_{it,jt} + \mu_{ij} + \varepsilon_{ijt} \quad (1)$$

where i and j denote the interested country, Vietnam, and its trading partners; t denotes the monthly-time; *export* stands for the aggregate volume of Vietnamese exports and four subsections of exports, including textile and garment industry, footwear industry, computer and electronic industry and telephone and component industry; gdp represents gross domestic product; *covidbur* indicates the number of people involved with COVID-19, including infected cases and related death cases, the so-called COVID-19 burden; FTA is a proxy of multilateral trading resistances consisting of bilateral trade agreements in which both Vietnam and its partners are official members; X is a proxy vector of policy responses (consisting of government response index, economic support index, stringency index, and containment and health index) and income level of importers; μ_{ij} is country-pair fixed effects;

Variable	Obs	Mean	Std. Dev	Min	Max
Export	990	6.31E+08	1.08E+09	1.64E+07	8.43E+09
Textile	990	6.23E+07	1.77E+08	0	1.59E+09
Footwear	990	3.82E+07	8.62E+07	0	7.93E+08
Computers	990	1.01E+08	1.96E+08	0	1.23E+09
Phone	990	1.26E+08	2.30E+08	0	2.05E+09
Machinery	990	5.20E+07	1.19E+08	0	1.63E+09
casei	990	969,347.4	3,834,636	1	3.38E+07
deathi	990	20,802.32	74,405.65	1	604,248
casej	990	257,579.3	1,165,102	1	2.02E+07
deathj	990	7,307.465	26,345.68	1	351,754
government_responsej	990	37.34877	31.14911	0	87.55
economic_supportj	990	33.07756	35.73366	0	100
stringencyj	990	37.73698	31.96735	0	102.1615
containment_healthj	990	37.57493	31.26333	0	88.5690
government_responsei	990	36.71662	29.35213	1	71.4587
economic_supporti	990	19.18447	20.78445	0	50
stringencyi	990	40.69977	32.79433	1	90.5971
containment_healthi	990	38.94178	31.30423	1	79.991
fta	990	0.6241135	0.4845965	0	1
gdpj	990	8.90E+11	2.90E+12	12.878	2.14E+13
gdpi	990	9.55E+10	1.26E+11	93,373	2.62E+11
High income	990	0.6656535	0.4720007	0	1

Table 1. Summary of variables

Downloaded from http://www.emerald.com/ijoem/article-pdf/19/5/1113/9529762/ijoem-09-2021-1395.pdf by Hebrew University of Jerusalem user

and ϵ is the disturbance term. Note that, unlike Hayakawa and Mukunoki (2020), our study adds the effects of policy response to COVID-19 by Vietnam and trading partners on Vietnam's international trade, which can help provide more specific implications.

In the international literature, when considering factors impacting trade flows, there might be two common trends of inverse and similar directions. Therefore, in this study, we consider trade flows not only as a whole but also as subsectors of exports. In addition, we incorporate both the aggregate and sectoral exports from Vietnam to its 30 importers for a 33-month period. Thus, zero trade is unavoidable and there is heterogeneity among variables, which might indirectly or directly cause biased estimation results (Truong *et al.*, 2019; Hoang *et al.*, 2020; Dong and Truong, 2022). As suggested by Egger (2002) and Baltagi (2013), panel data were used for estimation in this study. In addition, as shown by Santos Silva and Tenreyro (2006, 2011), the PPML technique works well with panel data.

4. Estimation results

4.1 Impacts of the COVID-19 pandemic on Vietnam's exports in the first year, 2020

The estimated results for the impact of COVID-19 in 2020 on Vietnam's aggregate exports are presented in Table 2. Columns (I) and (IV) present the baseline estimation results for COVID-19 cases and deaths, respectively; columns (II) and (V) show estimated results interacted by the income level of importers; columns (III) and (VI) are estimations interacted by the policy index. Column (VII) shows estimated results for all factors. Our analysis is based mainly on the estimation results in the full model (column VII). Standard errors are clustered by country pairs; however, we have not reported the standard errors to avoid cluttering the tables.

The estimation results in Table 2 show that COVID-19 cases and deaths in trading partners have significantly negative effects on Vietnam's aggregate exports, in which, in the full mode, the negative impacts of COVID-19 deaths are significantly larger than the number of cases. In the full model, we find that COVID-19 cases in Vietnam have a negative effect on its exports to trading partners, while no evidence is found to reveal the impact of COVID-19 deaths in Vietnam on its exports. These estimated results are quite interesting and can be explained by the fact that, while Vietnam was among the best countries in dealing with COVID-19 in 2020, most of its important trading partners have had a very high number of COVID-19 cases and deaths, particularly the United States and EU countries. On the other hand, we do not find a relationship between the dummy variable high income and Vietnam's exports in all model.

In the full model, we find that the economic size of Vietnam and trading partners has positive effects on Vietnam's exports. Likewise, we find a positive effect of FTA engagement on Vietnam's exports in all models, showing the crucial role of economic linkages in maintaining trade activities and GVCs between Vietnam and trading partners amid the negative impacts of the COVID-19 pandemic.

The regression results show that government responses to the COVID-19 pandemic by both Vietnam and trading partners have positive effects on Vietnam's export value. This indicates that a higher policy government index by Vietnam and trading partners can facilitate the aggregate exports of Vietnam. However, specific measures generate the opposite effects. When considering policy responses separately, the estimation results indicate that Vietnam's stringent actions impede its export activities (except for the full model), while no evidence reveals the effect of trading partners' stringent measures. This implies that the lockdown policies in Vietnam have brought challenges for the transportation of products and input supply, which negatively affects Vietnam's production and export activities. Estimates show a negative effect of economic support from Vietnam and trading partners on Vietnam's exports; however, in the full model this variable is statistically insignificant. In contrast, the containment and health policies in Vietnam have a positive effect on Vietnam's exports, and no evidence shows a similar impact of trading partners' containment and health policies. This outcome

Downloaded from http://www.emerald.com/ijoem/article-pdf/19/5/1113/9529762/ijoem-09-2021-1395.pdf by Hebrew University of Jerusalem user

Variable	(I)	(II)	(III)	(IV)	(V)	(VI)	(VII)
lngdpi	−0.3937***	−0.3984***	−0.3563***	−0.3971***	−0.4024***	−0.3711***	0.4005***
lngdpj	0.3895***	0.3929***	0.4001***	0.3913***	0.3954***	0.4048***	0.5063***
fta	0.5497***	0.5973***	0.5642***	0.4839***	0.5226***	0.4909***	0.0074**
lncasei	0.2053	0.2046	0.2009				−0.1962*
lncasej	−0.1325**	−0.1619**	−0.1541**				−0.0294**
*income		0.0396	0.0296				−2.0618
lndeathi				0.3314	0.3230	0.3095*	0.1346
lndeathj				−0.1178***	−0.1542***	−0.1441***	−1.9098***
*income					0.0503	0.0378	3.4953
government_responsej			−2.6138			−4.3520	0.5753**
economic_supportj			0.0288			0.1361	−0.2958***
stringencyj			−1.4535			−1.9752	−0.7593
containment_healthj			3.4168			5.7298	0.9773
government_responsei			0.6089**			0.5501**	0.4261***
economic_supporti			−0.1892**			−0.2497***	0.0373
stringencyi			−1.2497**			−0.9804*	0.0801
containment_healthi			1.6668**			1.3209*	19.3381***
Pair-country fixed effect	yes	yes	yes	yes	yes	yes	yes
Periods	24 months	24 months	24 months	24 months	24 months	24 months	24 months
N	720	720	720	720	720	720	720
R-squared	0.3389	0.3657	0.4101	0.3405	0.3681	0.4177	0.4301
Pseudo-log-likelihood	−2.16E+11	−2.13E+11	−1.95E+11	−2.07E+11	−2.05E+11	−1.89E+11	−1.83E+11

Note(s): This table reports estimation results by the PPML method. Columns (I) and (IV) present the baseline estimation results for COVID-19 cases and deaths, respectively; columns (II) and (V) show estimated results interacted by the income level of importers; columns (III) and (VI) are estimations interacted by the policy index. *, ** and *** represent significance levels at 10%, 5% and 1%, respectively

Table 2.
Estimation results for the first year, 2020

Downloaded from http://www.emerald.com/ijoem/article-pdf/19/5/1113/9529762/ijoem-09-2021-1395.pdf by Hebrew University of Jerusalem user

implies that when combining restrictions with health measures such as testing policy and contact tracing, short-term investment in healthcare and investments in vaccines in Vietnam, the negative effects of COVID-19 on Vietnam's aggregate exports can be mitigated.

Table 3 presents estimated results for Vietnam's exports by crucial sectors in 2020. Columns (I) and (II) present estimation for the baseline model, while column (III) presents regression results for the full model. We find that the COVID-19 burden in trading partners disadvantageously affects Vietnam's exports in all subsectors (except for the estimation of telephone and components in the full model). The adverse impacts of trading partners' COVID-19 cases and deaths on Vietnam's exports are the largest in the textile and garment industry and footwear industry, and the lowest in the computer and electronic industry. This shows that in the case of Vietnam, the effect of the disruption of regional and global input supply in labor-intensive industries is more severe than that in technology-intensive industries. We do not find an effect of Vietnam's COVID-19 deaths on its bilateral exports to partners in all four sectors. In the full model, except for the footwear industry, estimates also show no effect of Vietnam's COVID-19 cases on its subindustry exports. As explained above, this is likely because the COVID-19 burden in Vietnam in 2020 is much less severe than that of most of its crucial trading partners.

Almost in line with the aggregate estimation, our estimates indicate that trading partners' economic size has positive effects on Vietnam's exports of sub-industrial sectors. On the other hand, the negative effect of Vietnam's GDP on its sectoral exports may be due to the effect of GDP decline on supply capability that leads to a decline in export value of these products. In addition, it is possibly because firms in Vietnam may focus more on the domestic market, which leads to export decline in those sectors. Estimation shows that engagement in FTAs is found to support Vietnam's exports in all four sectors, especially the computer and electronic industry. When incorporating the high-income dummy with COVID-19 cases in trading partners, we find a negative effect only on Vietnam's textile and garment exports, whereas when interacting with COVID-19 deaths in trading partners, no effect is found in all sectors. With respect to the policy responses to COVID-19, the estimation shows that the overall government response index of Vietnam has a significant impact on the country's exports in the computer and electronic industry as well as the telephone and component industry. In contrast, trading partners' policy responses do not affect Vietnam's exports in any of the four sectors. Estimates show that stringent measures in trading partners disadvantageously influence Vietnam's exports in all subsectors, whereas no evidence reveals the impact of Vietnam's stringent actions on its subindustry exports. We find a negative relationship between trading partners' containment and health measures and Vietnam's exports, but only in the telephone and component products, while Vietnam's containment and health policy has a positive effect on its textile and garment exports. Economic support from importing countries is found to positively affect Vietnam's exports in the textile and garment industry as well as in the telephone and component industry. Vietnam's economic support has a positive effect on its exports in all subsectors (except for the footwear industry). Clearly, the heterogeneous effects among subsectors are understandable because the magnitude of the COVID-19 burden might result in different levels in different industries, even having positive influences on some industries, especially those related to health and medicine products.

To realize the impact of COVID-19 in the first year of the pandemic, 2020, compared with the same period of 2019, we adopt an approach by Hayakawa and Mukunoki (2020) to calculate the change of trade as follows:

$$\Delta export_{ij} = \sum export_{ijt-2019} * exp\left[\left(\widehat{\alpha}_4 lncovidbur_{it} + \widehat{\alpha}_5 lncovidbur_{jt}\right) - 1\right] \quad (2)$$

Downloaded from http://www.emerald.com/ijoem/article-pdf/19/5/1113/9529762/ijoem-09-2021-1395.pdf by Hebrew University of Jerusalem user

Downloaded from http://www.emerald.com/ijoem/article-pdf/19/5/1113/9529762/ijoem-09-2021-1395.pdf by Hebrew University of Jerusalem user

Table 3.
Estimation results for subsectors in the first year, 2020

Variable	Footwear			Textile and garment			Computer and electronic products			Telephone and components		
	(I)	(II)	(III)	(I)	(II)	(III)	(I)	(II)	(III)	(I)	(II)	(III)
lngdpi	−0.5475***	−0.5503***	−0.5891***	−0.7334***	−0.7207***	−0.8135***	−0.3016***	−0.3137***	−0.2700**	−0.4216***	−0.4244***	−0.4485***
lngdpj	0.5734***	0.5443***	0.6050***	0.6946***	0.7003***	0.7414***	0.3155***	0.3113***	0.3169***	0.3824***	0.4022***	0.3941***
fta	0.2746**	0.3367***	0.2932**	0.3177*	0.2799*	0.2904*	0.6151***	0.5335***	0.5519***	0.3725***	0.2748**	0.3424***
lncasei	0.4646***		0.4619***	0.0870		0.0661	0.3005*		0.0204	−0.0035		−0.1484
lncasej	−0.2387***		−0.1961*	−0.1791***		−0.1459	−0.1298*		−0.2051**	−0.0765**		−0.0810**
*income			−0.1181			−0.2779**			−0.0362			−0.0942
lndeathi		−0.2570	−5.4826		−0.1228	−11.9200		0.4420	1.7628		0.1999	−3.4418
lndeathj		−0.1218***	−0.2405**		−0.1802***	−0.5830**		−0.1022**	−0.0264**		−0.1187***	0.1280***
*income			−0.7178			−3.1086			−1.1654			−2.2010
government_responsej			5.5847			14.2441			−1.0352			5.1917
economic_supportj			0.3794			1.4429***			0.2257			0.5566**
stringencyj			−0.1454**			−0.2885***			−0.2707**			−0.1931**
containment_healthj			−0.6800			−0.4281			−1.0712			−0.8271*
government_responsei			0.8145			−0.5435			1.9857*			0.8449*
economic_supporti			0.0559			0.2065*			0.5277***			0.3383***
stringencyi			−0.1596			−0.2043			0.0669			−0.0349
containment_healthi			0.2574			0.4991**			0.0754			0.1712
_cons	15.6111***	16.5474***	15.7704***	17.8098***	17.3058***	18.4712***	17.0228***	17.3916***	15.7259***	17.9395***	17.3899***	18.1474***
Pair-country fixed effect	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
Periods	24 months	24 months	24 months	24 months	24 months	24 months	24 months	24 months	24 months	24 months	24 months	24 months
N	720	720	720	720	720	720	720	720	720	720	720	720
R-squared	0.473	0.4702	0.4602	0.5301	0.5311	0.6281	0.1431	0.1504	0.2459	0.3302	0.3671	0.3266
Pseudo-log-likelihood	−1.60E+10	−1.63E+10	−1.50E+10	−3.09E+10	−3.12E+10	−2.83E+10	−5.92E+10	−5.61E+10	−5.19E+10	−1.66E+10	−1.56E+10	−1.65E+10

Note(s): This table reports estimation results by the PPML method. Columns (I) and (II) present estimation for the baseline model for COVID-19 cases and deaths, respectively; while column (III) presents regression results for the full model. *, ** and *** represent significance levels at 10%, 5% and 1%, respectively

where $\Delta export$ is the change in Vietnamese exports caused by COVID-19, while $\widehat{\alpha_4}$ and $\widehat{\alpha_5}$ are obtained from the associated coefficients from model (I) in Tables 2 and 3. Results for aggregate exports and its subsectors are reported in Tables 4 and 5, respectively.

At the aggregate level, Table 4 shows that, compared to 2019, the COVID-19 pandemic caused a significant loss in the top four export destinations of Vietnam in 2020, both in terms of absolute value and growth rate. For instance, Vietnam's exports to the United States, China, Japan and South Korea predictably lost US$4.57 billion, US$4.26 billion, US$2.39 billion and US$2.90 billion, respectively. Meanwhile, there are less important markets for Vietnam's exports to gain in the first year of the pandemic, such as Singapore, Germany, the Philippines and Malaysia. With respect to growth rate, the high expansion rates in Vietnam's exports include the Philippines, Russia and Malaysia. In general, in 2020, Vietnam's export losses due to the COVID-19 burden were much higher than the export gains from this pandemic.

At the sectoral level, Table 5 indicates that the effects of the COVID-19 burden on Vietnam's exports to trading partners in the first year of the pandemic varied widely across industries. The loss of Vietnam's exports to trading partners is the largest in the textile and garment industry, followed by the telephone and component industry. With respect to the most crucial export destinations, Vietnam's exports to the United States have been negatively influenced in all sectors, with the largest decline in the textile and garment industry, followed by the telephone and component industry. In the second important export destination, China, the highest loss is in the telephone and component products, followed by computer and electronic products. Meanwhile, Vietnam's export decline was found to be significant in the textile and garment industry in Japan and the telephone and component industry in South Korea. On the other hand, there were predictable sectoral export gains from Vietnam in importing countries in the first year of the COVID-19 pandemic compared to the previous year. For the textile and garment industry, the estimation indicates that Vietnam's export gains are considerable in the Philippines, the United Kingdom and Germany, while in the footwear industry, a significant export increase is found in Germany and the United Kingdom. Regarding the computer and electronic industry, there are remarkable export gains in Italy, Canada and the Philippines. In the telephone and component industry, the markets for Vietnam's considerable export gains are the United Kingdom, Singapore and United Arab

Table 4.
Impacts of the COVID-19 pandemic on Vietnam's exports in the first year, 2020

Country	Value (US$ million)	Growth (%)	Country	Value (US$ million)	Growth (%)
Australia	108.30	2.34	South Korea	−2,902.78	−12.29
Austria	222.48	10.98	Malaysia	268.39	14.12
Belgium	−131.91	−1.41	Mexico	138.20	9.48
Brazil	103.75	1.99	Netherlands	−245.48	−67.25
Cambodia	−291.21	−13.21	Philippines	277.52	15.12
Canada	242.65	13.92	Poland	−105.17	−10.14
Chile	128.812	13.62	Russia	231.39	14.13
China	−4,262.59	−11.26	Singapore	355.77	10.94
France	170.77	9.04	Slovakia	−100.76	−12.04
Germany	288.14	5.21	Spain	112.10	6.84
Hong Kong	−1,033.30	−6.76	Sweden	90.01	2.06
India	38.37	1.49	Thailand	155.02	7.21
Indonesia	174.18	12.05	United Arab Emirates	79.13	6.57
Italy	187.37	12.07	United Kingdom	217.90	12.08
Japan	−2,392.25	−11.18	United States	−4,572.74	−8.09

Note(s): Impacts of COVID-19 on Vietnam's exports are calculated from (I) in Table 2

Downloaded from http://www.emerald.com/ijoem/article-pdf/19/5/1113/9529762/ijoem-09-2021-1395.pdf by Hebrew University of Jerusalem user

Country	Textile and garment		Footwear		Computer and electronic products		Telephone and component	
	Value (US$ million)	Growth (%)	Value (US$ million)	Growth (%)	Value (US$ million)	Growth (%)	Value (US$ million)	Growth (%)
Australia	10.56	5.02	2.35	0.01	39.28	13.21	18.26	8.12
Austria	30.05	9.17	26.58	14.25	99.25	18.26	150.36	9.54
Belgium	−5.18	−2.05	−74.49	−7.75	−9.65	−15.42	−123.28	−6.24
Brazil	22.32	19.77	18.67	6.32	85.58	12.01	38.52	7.24
Cambodia	−14.39	−2.87	−35.85	−3.51	−101.41	−19.22	−158.40	−13.21
Canada	50.14	6.21	5.12	0.62	112.02	45.26	99.23	25.64
Chile	23.48	15.21	28.23	18.12	99.25	34.76	68.75	45.16
China	−139.2 6	−9.49	−169.78	−9.25	−214.21	−9.21	−721.62	−9.34
France	30.12	4.02	31.25	6.25	69.23	5.26	29.25	1.25
Germany	52.26	5.36	82.23	7.58	60.12	9.23	32.14	3.12
Hong Kong	−22.36	−4.26	−125.36	−9.63	−223.01	−17.41	−36.28	−2.10
India	15.26	0.69	19.26	4.27	9.36	1.36	25.12	7.12
Indonesia	20.36	7.77	30.25	24.03	99.27	13.28	125.85	15.12
Italy	18.36	7.36	2.14	0.25	125.25	23.25	56.32	5.99
Japan	−361.25	−9.89	−184.25	−9.26	6.25	0.94	−185.26	−9.64
South Korea	−256.34	−10.96	−52.36	−4.26	−210.29	−11.23	−302.62	−15.68
Malaysia	32.25	6.87	36.65	14.25	59.24	10.37	100.98	6.48
Mexico	44.12	21.05	25.36	6.41	38.74	4.17	100.68	13.86
Netherlands	−24.35	−3.75	−45.67	−8.91	−50.24	−7.67	12.03	3.64
Philippines	65.79	14.57	35.26	17.82	100.26	21.78	99.83	10.27
Poland	−28.11	−20.27	−31.84	−15.37	−9.78	−8.68	−145.25	−11.83
Russia	23.45	9.78	25.79	15.48	93.27	23.59	40.87	9.99
Singapore	40.25	17.28	−36.85	−8.78	99.27	15.48	183.24	19.54
Slovakia	−29.54	−8.47	−50.27	−9.67	−20.97	−10.78	−22.77	−17.34
Spain	9.64	3.27	10.11	8.47	99.58	12.49	52.36	9.68
Sweden	2.35	1.08	18.64	6.54	85.47	15.92	64.37	8.76
Thailand	15.32	8.87	21.65	5.34	88.64	5.55	44.21	9.89
United Arab Emirates	36.35	16.69	20.38	4.57	99.67	6.38	156.12	12.88
United Kingdom	63.15	6.25	65.35	25.17	25.87	9.99	263.87	26.67
United States	−1,851.61	−14.21	−434.65	−5.77	−490.76	−8.54	−864.79	−15.27

Note(s): The changes in export values are compared with 2019

Table 5. Impacts of the COVID-19 pandemic on Vietnam's sectoral exports in the first year, 2020

Emirates. Overall, in the first year of the pandemic, the losses due to the COVID-19 burden on Vietnam's exports dominated its export gains from the pandemic in all major industries, except the computer and electronic industry.

4.2 Impacts of the COVID-19 pandemic on Vietnam's exports (January 2019–September 2021)

To have more evaluation on the effect of COVID-19, we estimated the impact of the pandemic on the aggregate exports of Vietnam between January 2019 and September 2021. The main estimation results are presented in Table 6. Columns (I) and (IV) present the baseline estimation results for COVID-19 cases and deaths, respectively; columns (II) and (V) show estimated results interacted by income level of importers; columns (III) and (VI) present estimations interacted by the policy index and column (VII) presents estimated results for all factors.

Downloaded from http://www.emerald.com/ijoem/article-pdf/19/5/1113/9529762/ijoem-09-2021-1395.pdf by Hebrew University of Jerusalem user

Table 6.
Estimation results for aggregate exports for the whole study period

Variable	(I)	(II)	(III)	(IV)	(V)	(VI)	(VII)
lngdpi	−0.5241***	−0.5270***	−0.5212***	−0.5125***	−0.5177***	−0.5157***	−0.5296***
lngdpj	0.4948***	0.4971***	0.5042***	0.4932***	0.5039***	0.4960***	0.4935***
fta	0.3163**	0.3389**	0.2864**	0.2954**	0.2662*	0.3174**	0.2690*
lncasei	−0.0356*	−0.0346*	0.0233				−0.1122*
lncasej	−0.0678***	−0.0775***	−0.0721***				−0.0087***
*income		0.0139	0.0105*				0.0171*
lndeathi				−0.0350**	−0.0223	−0.0340*	−2.2501**
lndeathj				−0.0616**	−0.0734**	−0.0770**	−0.0749*
*income					0.0151*	0.0213	0.6802
government_responsej			−2.7688			−2.6218	2.0733
economic_supportj			0.0633			0.0670	0.8815***
stringencyj			−0.6351			−0.5460	−0.0603*
containment_healthj			2.5042			2.2608	−0.6122**
government_responsei			0.8431***			0.8319***	0.5962*
economic_supporti			−0.0438			−0.0421	0.1407**
stringencyi			−0.7934***			−0.7438**	−0.0406
containment_healthi			0.8943**			0.8274**	−0.0093
_cons	20.0580***	20.0565***	19.6917***	19.8055***	19.6410***	19.8015***	20.2398***
Pair-country fixed effect	yes	yes	yes	yes	yes	yes	yes
Periods	33 months	33 months	33 months	33 months	33 months	33 months	33 months
N	990	990	990	990	990	990	990
R-squared	0.4329	0.4372	0.4681	0.4423	0.4465	0.4744	0.4546
Pseudo-log-likelihood	−2.95E+11	−2.94E+11	−2.77E+11	−2.94E+11	−2.93E+11	−2.76E+11	−2.75E+11

Note(s): This table reports estimation results by the PPML method. Columns (I) and (IV) present the baseline estimation results for COVID-19 cases and deaths, respectively; columns (II) and (V) show estimated results interacted by the income level of importers; columns (III) and (VI) are estimations interacted by the policy index. *, ** and *** represent significance levels at 10%, 5% and 1%, respectively

Downloaded from http://www.emerald.com/ijoem/article-pdf/19/5/1113/9529762/ijoem-09-2021-1395.pdf by Hebrew University of Jerusalem user

In line with estimation in 2020, in the whole study period, we find that the COVID-19 burden on trading partners has negative effects on Vietnam's aggregate exports in all models, of which the disadvantageous impacts of COVID-19 cases are less severe than that of COVID-19 deaths. Estimates also show a negative nexus between Vietnam's COVID-19 burden and its exports to trading partners, of which the magnitude of the effect of COVID-19 deaths is much greater than that of COVID-19 cases. Additionally, compared to estimations for 2020 (see Table 2), the negative impacts of COVID-19 cases in both Vietnam and trading partners on Vietnam's exports are much less severe than those in the whole study period. This shows that over a longer period, although there is a rapidly increasing number of COVID-19 cases in both Vietnam and trading partners, their effects on Vietnam's exports have been significantly mitigated. In 2020, no evidence was found to represent the impact of Vietnam's COVID-19 deaths; however, in the entire study period, there are considerable negative effects of Vietnam's COVID-19 deaths on its exports. In fact, the number of COVID-19 deaths in Vietnam significantly increased in 2021, especially during the third quarter. These estimated results imply that over a longer period, efforts to reduce the number of COVID-19 deaths in Vietnam trading partners could be more helpful for the survival of Vietnam's international trade. Meanwhile, in the long term, efforts to reduce the number of COVID-19 cases in Vietnam and trading partners may not create significant effects on Vietnam's exports compared to the short term.

In all models, the estimated results demonstrate positive effects of trading partners' economic size and FTAs on Vietnam's exports. In the full model, we find only the positive effect of the dummy high income when interacting with COVID-19 cases in trading partners.

We included policy response to COVID-19 by both Vietnam and trading partners to investigate the effect of the pandemic on Vietnam's exports. The estimated results in Table 6 show that when considering the policy response separately, no evidence reveals the effects of government response, economic support, stringent action, and containment and health policies in trading partners on Vietnam's exports. In the full model, we find that economic support by importing countries has an advantageous impact on Vietnam's exports; in contrast, stringent actions, containment and health policies in trading partners have a negative effect. With respect to Vietnam, in the full model, estimates show that Vietnam's government response and economic support can enhance its export activities. Meanwhile, when considering the impact of policy response separately, we find a negative effect of stringent measures and a positive effect of containment and health policy. This suggests that in the longer term, it is necessary to relax stringent measures while improving the efficiency of health actions and economic support in both Vietnam and trading partners to increase Vietnam's export value.

Next, we estimated the effect of the COVID-19 burden and other factors on Vietnam's sectoral exports for the whole study period. The estimation results are shown in Table 7. Columns (I) and (II) present the estimated results for the baseline model; column (III) presents the estimated results for the full model. In general, we find heterogeneous effects of variables across export sectors from Vietnam on its trading partners.

In the full model, we find that the COVID-19 burden in trading partners negatively affects Vietnam's exports in nearly all sectors. For instance, estimates show that except for the computer and electronic industry, trading partners' COVID-19 cases negatively affect subsectors, of which the textile and garment industry is the most affected. The textile and garment industry is also the sector most affected by trading partners' COVID-19 deaths, while the computer and electronic industry is the least affected. In the full model, regression results indicate that Vietnam's COVID-19 cases disadvantageously affect its computer and electronic exports, whereas no evidence is found to reveal the effect of Vietnam's COVID-19 cases on its exports in other sectors, since the coefficients are statistically insignificant. In the full mode, we find that Vietnam's COVID-19 deaths remarkably impede its textile and garment exports, followed by telephone and component exports, while this variable does not have an effect on the footwear industry as well as on the computer and electronic industry.

Downloaded from http://www.emerald.com/ijoem/article-pdf/19/5/1113/9529762/ijoem-09-2021-1395.pdf by Hebrew University of Jerusalem user

Table 7.
Estimated results for Vietnam's sectoral exports for the whole study period

Variable	Footwear			Textile and garment			Computer and electronic products			Telephone and components		
	(I)	(II)	(III)	(I)	(II)	(III)	(I)	(II)	(III)	(I)	(II)	(III)
lngdpi	−0.6984***	−0.7122***	−0.7009***	−0.8493***	−0.8443***	0.8458***	−0.3544***	−0.3549***	−0.3668***	−0.6653***	−0.6607***	−0.6696***
lngdpj	0.6728***	0.6772***	0.6867***	0.7937***	0.7975***	0.7959***	0.4037***	0.4058***	0.3890***	0.5913***	0.5865***	0.5799***
fta	0.1399*	0.1176*	0.1038	0.1176	0.0773**	0.1285	0.4092**	0.3988**	0.3759**	−0.0952	−0.1386	−0.0946
lncasei	0.0895***		0.0851	0.0768***		−0.1351	−0.0160		−0.1946**	0.0846***		−0.0036
lncasej	−0.1554***		−0.0237**	−0.2360***		−0.2860***	0.0226		0.0876*	−0.1402***		−0.1905**
*income			0.0463			0.0701*			0.0143			0.0943*
lndeathi		0.0749***	−2.4930		−5.0390*	−5.9360*		−1.1942	−0.6657		−0.9718	−1.1830*
lndeathj		−0.1967***	−0.1950**		−0.1833*	−0.2001*		0.0077**	0.0024*		−0.0363	−0.0507*
*income			2.7156*			0.4421			0.1671***			0.7717
government_responsej			−1.0939			−5.8260*			−0.1422			1.2409
economic_supportj			0.5473*			1.4551***			0.6926*			0.9011***
stringencyj			0.0004			−0.0401			−0.0291			0.0017
containment_healthj			−0.4172			−0.3738			−0.8168*			−0.4592
government_responsei			0.4285			−0.7513			1.4352***			0.0899
economic_supporti			−0.0268			−0.0522			0.1842**			0.0925
stringencyi			−0.2139*			0.0339			−0.0949			0.0992
containment_healthi			0.0355			0.0334			0.0295			−0.0938
_cons	17.0123***	17.2938***	16.7663***	18.1635***	17.9754***	17.9836***	15.9139***	15.8924***	16.7034***	18.6637***	18.7222***	19.0908***
Pair-country fixed effect	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
Periods	33 months	33 months	33 months	33 months	33 months	33 months	33 months	33 months	33 months	33 months	33 months	33 months
N	990	990	990	990	990	990	990	990	990	990	990	990
R-squared	0.6716	0.6662	0.6768	0.6624	0.6582	0.6675	0.2359	0.2400	0.2398	0.6765	0.6590	0.6764
Pseudo log-likelihood	−1.93E+10	−1.92E+10	−1.90E+10	−3.72E+10	−3.78E+10	−3.71E+10	−7.88E+10	−7.89E+10	−7.78E+10	−2.47E+10	−2.49E+10	−2.45E+10

Note(s): This table reports estimation results by the PPML method. Columns (I) and (II) present estimation for the baseline model for COVID-19 cases and deaths, respectively, while column (III) presents regression results for the full model. *, ** and *** represent significance levels at 10%, 5% and 1%, respectively

Downloaded from http://www.emerald.com/ijoem/article-pdf/19/5/1113/9529762/ijoem-09-2021-1395.pdf by Hebrew University of Jerusalem user

There is a positive relationship between importing countries' economic scale and Vietnam's exports in all subsectors in all models. Except for the telephone and component industry, we also find a positive effect of FTAs on Vietnam's exports in all subsectors, with the largest effect on the computer and electronic industry. When incorporating the dummy high income with COVID-19 cases in trading partners, we find an advantageous effect on Vietnam's exports in the textile and garment industry as well as in the telephone and component industry. When interacting with trading partners' COVID-19 deaths, estimates show that the dummy high income has a positive impact on Vietnam's exports in the footwear industry as well as in the computer and electronic industry.

Estimates show that the policy responses by Vietnam and trading partners generate heterogeneous impacts across industries in Vietnam's exports. We find that the government response of trading partners has a negative effect only on Vietnam's textile and garment exports. Importing countries' containment and health measures are found to impede Vietnam's computer and electronic exports. Conversely, trading partners' economic support has a positive influence on Vietnam's exports in all subsectors, with the strongest effect on the textile and garment industry. Meanwhile, no evidence is found to reveal the effect of stringent measures by importing countries on Vietnam's exports in all subsectors, since the estimated results for stringency index are statistically insignificant. We find that government response and economic support in Vietnam have a positive effect on its computer and electronic exports, while no effect is found in other sectors. Vietnam's stringency measures negatively affect its footwear exports. Finally, no evidence demonstrates the effect of Vietnam's containment and heath measures on its exports in all subsectors.

To figure out the effects of COVID-19 (absolute value in US$ millions) in different periods, we similarly employ Equation (2), but estimations for only nine months of 2021 and 2020, and compare these results with the same period of 2019, respectively. The estimated results for aggregate and sectoral data are reported in Tables 8 and 9.

At the aggregate level, estimation results in Table 8 show that the negative effect of COVID-19 burden in the first nine months of 2021 was much smaller compared with the first nine months of 2020. This demonstrates that over a longer period, manufacturing and export activities in Vietnam have been adjusted to better cope with the new COVID-19 situation both in Vietnam and trading partners. In particular, the most improved export destinations for

Country	Jan–Sep, 2020	Jan–Sep, 2021	Country	Jan–Sep, 2020	Jan–Sep, 2021
Australia	56.98	77.58	South Korea	−2,103.24	−999.37
Austria	195.34	198.97	Malaysia	192.37	182.37
Belgium	−113.21	−65.38	Mexico	110.89	99.84
Brazil	99.37	59.57	Netherlands	−235.14	−120.35
Cambodia	−192.97	−153.24	Philippines	200.87	198.67
Canada	200.54	223.57	Poland	−99.51	12.54
Chile	89.37	99.37	Russia	186.38	195.34
China	−397.38	−125.37	Singapore	300.27	321.25
France	125.64	129.57	Slovakia	−61.57	−11.25
Germany	210.34	248.64	Spain	89.85	98.34
Hong Kong	−999.34	−561.84	Sweden	80.83	79.84
India	29.67	28.37	Thailand	102.27	123.35
Indonesia	150.36	149.34	United Arab Emirates	67.35	74.12
Italy	150.84	164.31	United Kingdom	178.82	188.47
Japan	−2,031.58	−1,020.24	United States	−3,760.24	−156.34

Note(s): Impacts of COVID-19 on Vietnam's exports are calculated from (I) in Table 2. The changes in export values are compared with the same period of 2019

Table 8.
Impacts of the COVID-19 pandemic on Vietnam's exports in different periods

Downloaded from http://www.emerald.com/ijoem/article-pdf/19/5/1113/9529762/ijoem-09-2021-1395.pdf by Hebrew University of Jerusalem user

Country	Textile and garment		Footwear		Computer and electronic products		Telephone and component	
	Jan–Sep, 2020	Jan–Sep, 2021	Jan–Sep, 2020	Jan–Sep, 2021	Jan–Sep, 2020	Jan–Sep, 2021	Jan–Sep, 2020	Jan–Sep, 2021
Australia	10.56	11.23	2.35	2.16	39.28	65.32	18.26	19.32
Austria	30.05	32.24	26.58	31.56	99.25	99.99	150.36	213.24
Belgium	−5.18	1.24	−74.49	−16.34	−9.65	6.34	−123.28	−29.64
Brazil	22.32	24.12	18.67	15.34	85.58	56.31	38.52	56.27
Cambodia	−14.39	1.28	−35.85	0.58	−101.41	−21.25	−158.40	−99.51
Canada	50.14	21.14	5.12	6.34	112.02	223.5	99.23	125.24
Chile	23.48	25.36	28.23	25.36	99.25	88.67	68.75	25.34
China	−139.26	−10.25	−169.78	−186.54	−214.21	−196.34	−721.62	−726.21
France	30.12	53.21	31.25	22.25	69.23	96.57	29.25	31.28
Germany	52.26	63.27	82.23	79.64	60.12	89.54	32.14	63.54
Hong Kong	−22.36	1.25	−125.36	−99.87	−223.01	−12.87	−36.28	1.27
India	15.26	22.34	19.26	23.35	9.36	6.54	25.12	19.84
Indonesia	20.36	32.87	30.25	29.65	99.27	75.64	125.85	129.34
Italy	18.36	56.39	2.14	6.34	125.25	156.24	56.32	57.60
Japan	−361.25	−251.24	−184.25	−120.86	6.25	25.34	−185.26	−156.23
South Korea	−256.34	−128.95	−52.36	−25.31	−210.29	−59.64	−302.62	−230.25
Malaysia	32.25	36.87	36.65	37.25	59.24	52.59	100.98	99.31
Mexico	44.12	58.76	25.36	15.64	38.74	40.12	100.68	88.32
Netherlands	−24.35	−0.97	−45.67	−10.83	−50.24	−12.46	12.03	11.25
Philippines	65.79	54.23	35.26	27.58	100.26	92.37	99.83	102.52
Poland	−28.11	−10.25	−31.84	−10.54	−9.78	1.25	−145.25	−120.65
Russia	23.45	12.56	25.79	25.55	93.27	88.64	40.87	44.65
Singapore	40.25	53.21	−36.85	−24.38	99.27	120.32	183.24	203.35
Slovakia	−29.54	−5.47	−50.27	−12.32	−20.97	−2.64	−22.77	0.95
Spain	9.64	23.85	10.11	56.25	99.58	156.84	52.36	62.34
Sweden	2.35	15.64	18.64	62.87	85.47	97.61	64.37	59.34
Thailand	15.32	16.34	21.65	19.61	88.64	84.31	44.21	45.66
United Arab Emirates	36.35	37.28	20.38	19.52	99.67	93.37	156.12	156.95
United Kingdom	63.15	77.24	65.35	77.68	25.87	64.13	263.87	264.28
United States	−1,851.61	−965.31	−434.65	−229.99	−490.76	−351.02	−864.79	−399.58

Note(s): The changes in export values are compared with the same period of 2019

Table 9.
Impacts of the COVID-19 pandemic on Vietnam's sectoral exports in different periods

Vietnamese products during the nine months of 2021 include United States, Japan, South Korea, Hong Kong and China, which are also the most crucial export markets of Vietnam. On the opposite direction, under the effect of COVID-19 pandemic, Vietnam's exports in the nine months of 2021 have witnessed the highest reduction in terms of value in Brazil, Mexico and Malaysia.

At the sectoral level, estimation results in Table 9 show that, compared to the previous period, in the nine months of 2021, Vietnam has improved its exports in all sectors, especially in the textile and garment industry. Looking at detailed markets, estimates show that the most improved export markets for Vietnam's textile and garment products are the United States, China, South Korea and Japan, while the least improved export destinations include Canada, the Philippines and Russia. In the footwear industry, the most improved export destinations include the United States, Japan, Belgium, Spain and Sweden, whereas the least improved markets are China, Mexico and the Philippines. In the computer and electronic industry, Vietnam's exports show a significant expansion in Hong Kong, South Korea, the

Downloaded from http://www.emerald.com/ijoem/article-pdf/19/5/1113/9529762/ijoem-09-2021-1395.pdf by Hebrew University of Jerusalem user

United States and Canada, while Brazil, Indonesia and Chile are markets with the least improvements. In the telephone and component industry, Vietnam has sharply improved its exports to the United States, Belgium, South Korea and Cambodia. Conversely, Chile and Mexico are markets for which Vietnam's telephone and component exports show modest improvements.

5. Concluding remarks and policy implications

There are a rapidly increasing number of studies related to the impact of the COVID-19 pandemic on the social and economic aspects of countries. Recent literature has also attempted to investigate the effects of the pandemic on international trade, particularly regarding China, but little research has focused on smaller developing countries, such as Vietnam. In particular, few empirical studies have incorporated policy responses into estimates of the effect of the COVID-19 burden on international trade in these economies. Using monthly trade data and the PPML estimator, our study is among the first to investigate the effects of COVID-19 burden and policy response to this pandemic on export activities in Vietnam.

At the aggregate level, in the first year of the pandemic (January–December 2020) and the whole study period (January 2020–September 2021), we find that trading partners' COVID-19 burden negatively affects Vietnam's aggregate exports, of which the effect of COVID-19 deaths is significantly larger than that of COVID-19 cases. It is worth noting that the negative effects of importing countries' COVID-19 cases and deaths over the whole study period are much less critial than the first year of the pandemic. In the first year of the pandemic, estimates show a negative effect of Vietnam's COVID-19 cases on its exports, while no evidence reveals the impact of Vietnam's COVID-19 deaths. However, over the entire study period, we find remarkably adverse effects of Vietnam's COVID-19 deaths on its exports, while the negative effect of Vietnam's COVID-19 cases is lower. In 2020, estimates show a positive role of government responses to the pandemic by Vietnam and trading partners in Vietnam's aggregate exports, while in the whole study period, there is only the positive effect of Vietnam's government response. In nearly all models, we find a negative effect of stringent actions by Vietnam and trading partners on Vietnam's exports, while economic support has a positive effect. We also find a positive effect of containment and health measures by Vietnam on its export activities. Likewise, FTA engagement is found to enhance Vietnam's exports to trading partners in all models, indicating the crucial role of economic integration in maintaining manufacturing and export activities in Vietnam. At the sectoral level, in the first year and the whole study period, trading partners' COVID-19 burden negatively influenced all four major export industries. Meanwhile, there are different effects of Vietnam's COVID-19 burden across its export industries. During the entire study period, Vietnam's COVID-19 cases have negative effects only on computer and electronic exports, while Vietnam's COVID-19 deaths are found to impede its exports in the textile and garment industry as well as the telephone and electronic industry.

When measuring the losses and gains from the impact of COVID-19 on Vietnam's exports in 2020, we find that the losses due to the pandemic on Vietnam's exports significantly outweighed the country's gains. However, we find that in the nine months of 2021, there are significant improvements in Vietnam's export activities, particularly in its crucial export destinations.

From the estimated results, we suggest several implications for enhancing Vietnam's exports in the future as follows. First, we find that despite rapidly increasing number of COVID-19 cases, the negative effects of COVID-19 cases are significantly lower than COVID-19 deaths. This suggests that efforts by the governments of Vietnam and trading partners should aim to decrease the number of COVID-19 deaths rather than concentrate on reducing the number of COVID-19 cases. Second, in the long term, the application of stringency measures by both Vietnam and trading partners should be minimized, or at least those

Downloaded from http://www.emerald.com/ijoem/article-pdf/19/5/1113/9529762/ijoem-09-2021-1395.pdf by Hebrew University of Jerusalem user

measures need to be combined with health methods, such as testing policy and contact tracing, short-term investment in healthcare and especially investments in vaccines. Third, our estimated results show the positive effect of economic support on Vietnam's international trade. Therefore, economic support programs, particularly debt relief, need to be widely applied to assist firms, especially those involved in international trade. Fourth, Vietnam's exports should be more diversified. Finally, to mitigate the impact of COVID-19, Vietnam needs to expand its FTA network and facilitate the use of FTAs by, for example, simplifying the procedure to obtain a certificate of origin, disseminating the information on the merits of using FTAs, providing financial support and providing human resource training for the enterprise sector.

References

Atkeson, A. (2020), "What will be the economic impact of COVID-19 in the US? Rough estimates of disease scenarios", NBER, Working Papers, No. w26867.

Baker, S.R., Nicholas, B., Steven, J.D. and Stephen, J.T. (2020), "COVID-Induced economic uncertainty", NBER, Working Papers, No. w26983.

Baldwin, R. and Tomiura, E. (2020), "Thinking ahead about the trade impact of COVID-19", in Baldwin, R. and Di Mauro, B.W. (Eds), *Economics in the Time of COVID-19*, CEPR Press, pp. 59-71.

Baltagi, B.H. (2013), *Econometric Analysis of Panel Data*, 5th ed., John Wiley & Sons, Chichester, West Sussex.

Barbero, J., de Lucio, J.J. and Rodríguez-Crespo, E. (2021), "Effects of COVID-19 on trade flows: measuring their impact through government policy responses", *PloS One*, Vol. 16 No. 10, e0258356.

Bekkers, E. and Koopman, R.B. (2020), "Simulating the trade effects of the COVID-19 pandemic: scenario analysis based on quantitative trade modelling", *The World Economy*. doi: 10.1111/twec.13063.

Brewer, M. and Gardiner, L. (2020), "The initial impact of COVID-19 and policy responses on household incomes", *Oxford Review of Economic Policy*, Vol. 36 No. 1, pp. S187-S199.

Courtemanche, C., Joseph, G., Anh, L., Joshua, P. and Aaron, Y. (2020), "Strong social distancing measures in the United States reduced the COVID-19 growth rate", *Health Affairs*, Vol. 9 No. 7, pp. 1237-1246.

Dao, L.T.A. and Gan, C. (2021), "The impact of the COVID-19 lockdown on stock market performance: evidence from Vietnam", *Journal of Economic Studies*, Vol. 48 No. 4, pp. 836-851.

Davidescu, A.A., Popovici, O.C. and Strat, V.A. (2022), "An empirical analysis using panel data gravity models and scenario forecast simulations for the Romanian exports in the context of COVID-19", *Economic Research-Ekonomska Istraživanja*, Vol. 35 No. 1, pp. 480-510.

Dev, S.M. and Sengupta, R. (2020), "COVID-19: impact on the Indian economy. Indira Gandhi Institute of development research", No. WP-2020-013.

Dong, V.C. and Truong, H.Q. (2022), "Determinants and potential of seafood trade: evidence from a transitional economy", *Foreign Trade Review*, doi: 10.1177/00157325221077003.

Egger, P. (2002), "An econometric view on the estimation of gravity models and the calculation of trade potentials", *World Economy*, Vol. 25 No. 2, pp. 297-312.

Eppinger, P., Felbermayr, G., Krebs, O. and Kukharskyy, B. (2020), "COVID-19 shocking global value chains", CESifo, Working Papers, No. 8572.

ERIA (2020), "COVID-19 and southeast and East Asian economic integration: understanding the consequences for the future", ERIA Policy Brief, No. 2020-01.

Downloaded from http://www.emerald.com/ijoem/article-pdf/19/5/1113/9529762/ijoem-09-2021-1395.pdf by Hebrew University of Jerusalem user

Espitia, A., Mattoo, A., Rocha, N., Ruta, M. and Winkler, D. (2021), "Pandemic trade: COVID-19, remote work and global value chains", *The World Economy*. doi: 10.1111/twec.13117.

Fernandes, N. (2020), "Economic effects of coronavirus outbreak (COVID-19) on the world economy", IESE Business School, Working Paper No. WP-1240-E.

Gruszczynski, L. (2020), "The COVID-19 pandemic and international trade: temporary turbulence or paradigm shift?", *European Journal of Risk Regulation*, Vol. 11 No. 2, pp. 337-342.

Hayakawa, K. and Mukunoki, H. (2020), "Impacts of COVID-19 on international trade: evidence from the first quarter of 2020", IDE Discussion Paper No. 791 (2020-06).

Hayakawa, K. and Mukunoki, H. (2021), "Impacts of COVID-19 on global value chains", *The Developing Economies*, Vol. 59 No. 2, pp. 154-177.

Hoang, N.T.T., Truong, H.Q. and Dong, V.C. (2020), "Determinants of trade between Taiwan and ASEAN countries: a PPML estimator approach", *SAGE Open*, Vol. 10 No. 2, pp. 1-13.

Kejzar, K.Z. and Velic, A. (2020), "Covid-19, trade collapse and GVC linkages: European experience", *Covid Economics*, Vol. 61, pp. 222-244.

Kimura, F. (2020), "Exit strategies for ASEAN member states: keep production networks alive despite the impending demand shock", ERIA Policy Brief Nos 2020-03.

Kimura, F., Thangavelu, S.M., Narjoko, D. and Findlay, C. (2020), "Pandemic (COVID-19) policy, regional cooperation and the emerging global production network", *Asian Economic Journal*, Vol. 34 No. 1, pp. 3-27.

Lai, C.M.P. (2021), "How COVID-19 affects the share price of Vietnam's pharmaceutical industry: event study method", *Entrepreneurship and Sustainability Issues*, Vol. 8 No. 4, pp. 250-261.

Le, L.H.V., Huynh, T.L.D., Weber, B.S. and Nguyen, B.K.Q. (2021), "Different firm responses to the COVID-19 pandemic shocks: machine-learning evidence on the Vietnamese labor market", *International Journal of Emerging Market*. doi: 10.1108/IJOEM-02-2021-0292.

Liu, X., Ornelas, E. and Shi, H. (2021), "The trade impact of the COCID-19 pandemic", Discussion Paper No.1771, The Centre for Economic Performance.

Menon, J. (2020), "COVID-19 and ASEAN+3: impacts and responses", *ISEAS Perspective*, Vol. 54, pp. 1-10.

Minondo, A. (2021), "Impact of COVID-19 on the trade of goods and services in Spain", *Applied Economic Analysis*, Vol. 29 No. 85, pp. 58-76.

Morisset, J. (2020), "Economic costs associated to the coronavirus pandemic for Vietnam", COVID-19 Policy Response Note, No. 1, World Bank, Washington, DC.

Nguyen, L.T.M. and Dinh, P.H. (2021), "Ex-ante risk management and financial stability during the COVID-19 pandemic: a study of Vietnamese firms", *China Finance Review International*, Vol. 11 No. 3, pp. 349-371.

Nguyen, H.H., Ngo, V.M. and Tran, A.N.T. (2021), "Financial performances, entrepreneurial factors and coping strategy to survive in the COVID-19 pandemic: case of Vietnam", *Research in International Business and Finance*, Vol. 56, 101380.

Niewiadomski, P. (2020), "COVID-19: from temporary de-globalisation to a Re-discovery of tourism?", *Tourism Geographies*, Vol. 22 No. 3, pp. 651-656.

Norouzi, N., Gerardo, Z., Saeideh, C. and Peter, E. (2020), "When pandemics impact economies and climate change: exploring the impacts of COVID-19 on oil and electricity demand in China", *Energy Research & Social Science*, Vol. 68, pp. 1-14.

Petri, P.A. and Plummer, M.G. (2020), "East Asia decouples from the United States: trade war, COVID-19, and East Asia's new trade blocs", Peterson Institute for International Economics, Working Paper Series No. WP20-09.

Santos Silva, J.M.C. and Tenreyro, S. (2006), "The log of gravity", *Review of Economics and Statistics*, Vol. 88 No. 4, pp. 641-658.

Downloaded from http://www.emerald.com/ijoem/article-pdf/19/5/1113/9529762/ijoem-09-2021-1395.pdf by Hebrew University of Jerusalem user

Santos Silva, J.M.C. and Tenreyro, S. (2011), "Further simulation evidence on the performance of the Poisson Pseudo maximum likelihood estimator", *Economics Letters*, Vol. 112 No. 2, pp. 220-222.

Sumner, Andrew, Hoy, Chris and Ortiz-Juarez, Eduardo (2020), "Estimates of the impact of COVID-19 on global poverty", World Institute for Development Economics Research, United Nations University, WIDER Working Paper No. 2020/43.

Suryahadi, A., Izzati, R.A. and Suryadarma, D. (2020), "Estimating the impact of COVID-19 outbreak on poverty", *Bulletin of Indonesian Economic Studies*, Vol. 56 No. 2, pp. 175-192.

Truong, H.Q., Dong, C.V. and Nguyen, H.H. (2019), "Determinants of trade flows and trade structure between Korea and ASEAN", *East Asian Economic Review*, Vol. 23 No. 1, pp. 55-88.

Vidya, C.T. and Prabheesh, K.P. (2020), "Implications of COVID-19 pandemic on the global trade networks", *Emerging Markets Finance and Trade*, Vol. 56 No. 10, pp. 2408-2421.

Vo, T.T. (2020), *Vietnam's Economy Post COVID: Poised for Growth? Webinar on 3 July 2020*, The ISEAS – Yusof Ishak Institute.

Zhang, W.W., Dawei, W., Majeed, M.T. and Sohail, S. (2022), "COVID-19 and international trade: insights and policy challenges in China and USA", *Economic Research-Ekonomska Istraživanja*, Vol. 35 No. 1, pp. 1991-2002.

Zhao, Y., Zhang, H., Ding, Y. and Tang, S. (2021), "Implications of COVID-19 pandemic on China's exports", *Emerging Markets Finance and Trade*, Vol. 57 No. 6, pp. 1716-1726.

About the authors

Chung Van Dong is the research fellow at the Institute of World Economies and Politics (IWEP). His papers are published in some peer-reviewed journals such as *China Report, East Asian Economic Review, Journal of Cultural Economics* and *Sage Open*. His research interests include Chinese studies, international trade and investment.

Hoan Quang Truong, PhD, is the research fellow at the Institute for Southeast Asian Studies, Vietnam Academy of Social Sciences. His main research fields include free flow of trade, investment and service in Southeast Asian area; and ASEAN's external economic relations, particularly with East Asian countries. His studies are published in peer-reviewed journals such as *China Report; ISEAS Perspective, East Asian Economic Review, Journal of Cultural Economics, Sage Open* and *Foreign Trade Review*. He won Empowering Network for International Thai Studies (ENITS) Project in 2015 and was a former Taiwan Fellowship Fellow in 2017. Hoan Quang Truong is the corresponding author and can be contacted at: quanghoan2310@gmail.com

For instructions on how to order reprints of this article, please visit our website:
www.emeraldgrouppublishing.com/licensing/reprints.htm
Or contact us for further details: **permissions@emeraldinsight.com**

Downloaded from http://www.emerald.com/ijoem/article-pdf/19/5/1113/9529762/ijoem-09-2021-1395.pdf by Hebrew University of Jerusalem user