Proposed Impact of Covid – 19 Pandemic on Economic Activities

BY

Adamu Balarabe Adamu

Sa'adatu Rimi College of Education Kano
Kano State
Email: adamubalarabe870@gmail.com

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Abstract

The study examined the impact of covid-19 on economic growth: opinions and attitudes. The purpose was to ascertain respondents' perception of the effect of the covid-19 pandemic on economic growth. The crossectional survey research design was employed and a mixed method was used in collecting the research data. Conduct validity index and face validity served to validate the research instrument while cronbach alpha was used to assure its reliability. The secondary data was analysed using percentage changes while the primary data were analysed using one sample t- test and least square method. Results of the respondents opinion indicated that the covid-19 induced lockdown has significantly contrained economic activities and the circular flow of income. Lastly, the perceived reduction in the circular flow of income in the wake of covid-19 lockdown has negatively impacted on economic growth. The need for policy makers to take drastic measures to curtail the pandemic and forestall a recession that may be consequent upon the pandemic was suggested among others.

Keywords : corona virus covid-19 pandemic ; the circular flow of income; economic activity; economic growth.

Introduction

The emergence and spread of covid-19, caused by the severe acute respiratory syndrome coronavirus 2 (SARS-COV2) has forced countries worldwide to implement non pharmaceutical interventions (NPI) to reduce or minimize the spread of the virus . These NPI, which include among others international travel restrictions, business closures , prohibition of large scale private and public gatherings and mandatory quarantines have been adopted so as to effectively minimize or reduce the rate at which the virus is transmitted. As a result , however, such policies have had large economic repercussions on both domestic industrial output as well as international trade , due to diminishing production and reduced demand of some goods. Example model- based estimate showed that the global industry value added tax may have dropped by 25—40% depending on the scale and severity of the implementation of NPI.

By quantifying the costs and benefits of various NPI on the economy and global trade becomes necessary to inform effective policy responses and to navigate the trade-off between slowing the pace of the pandemic and limiting economic impacts . however, monitoring the extent, and understanding the underlying causes, of the economic disruption on a global scale is hard for three reasons :

1) Traditional microeconomic indicators(example trade industry output) are often published at several month of delay
2) Their aggregate nature makes it hard to decipher the importance of various impact mechanisms.
3) Macroeconomic indicators are primarily available for high and upper-middle – income countries, thereby limiting our ability to understand what is happening in low in low and middle-income countries .

The COVID-19 outbreak (previously 2019 ncov) was caused by SARS-COV 2 virus. This outbreak was triggered in December 2019 in wuhan city in hubei province in china. COVID-19 continues to spread across the world. Initially the epicenter of the outbreak was china with reported cases either in china or being travelers from china. As at now, more epicenters have been identified and these are :Iran, Italy, japan, and south korea even though the cases reported from china are expected to have peaked but now falling(WHO 2020), therefore, alternative, higher temporal frequency, proxy data of economic activity with a global extent could help improve our understanding of the unfolding economic disruptions to economies globally. Moreover, one could leverage the cross-country heterogeneity in timing and severity of NPI to

examine the economic impacts of individual NPI across countries.

A growing body of literature has used high frequency data(HFD), such as electricity consumption, air pollution, night time light intensity and human mobility, to track the evolution of the pandemic on a country and a global scale. Inaddition, rescent research has used HFD sources to quantify the effect of individual NPI on domestic economic output. For instance, Fezzi and Faghella used daily electricity consumption data for Italy and found that the 3 weeks of severe lockdown the national GDP by almost 30%. Dep et al (5) used a variety of HFD to estimate the individual impacts of NPI, showing that workplace closures and a stay-at- home orders had the largest economic costs. However, proxies, such as electricity consumption and human mobility are often hard to relate directly to economic impacts , making it difficult to infer a causal relationship between NPI and economic activity. In addition, these studies often only include countries for which these HFD are available and rarely include countries in global south or island nations, making it hard to generalize the results.

Methods

Data and trade estimation

We derive estimate of port-level trade flows(imports and exports) for 1153 ports across 166 countries worldwide using the geospatial location and attributes of maritime vessels (from January 2019 ---august 2020). To do this we use automatic identification system(AIS) data, which provide detailed data on the location, speed, direction and vessel characteristics of all trade-carrying vessels with AIS transponder(that sends information to terrestrial or satellite receivers every few seconds—minutes. This data is obtained through a partnership with the UN global platform ais Task Team Innitiative , which aims to develop algorithms and methodologies to AIS data useful for a variety of fields and applications(traffic, economic trade, fisheries , co2 emissions).

Economic model:

The variation in trade losses across countries are driven by the differences in NPI introduced by countries (interms of timing duration, and severity), supply shortages to domestic supply chains, demand reductions in trade dependent economies and other country dependent specific characteristics(e.g share of tourism, liberalized credit markets). NPI can negatively influence industry output by affecting business operations(e.g workplace closure, mobility restrictions),or positively affects industry output through effectively containing the virus outbreak and thereby allowing industrial production processes and transportation of goods to continue

To study the implications of NPI on exports (which we use as a proxy of industrial output), we match our daily country-wide, estimate with data from the oxford COVID-19 Government response tracker(OXCGRT). Within OXCGRT, data is collected on the implementation and stringency of NPI across 160 countries. We utilize reduced-form econometric techniques to estimate the effect of different containment policies on exports across a balanced sample of 122 countries (for which data is available). We follow the approach in Lee and McKibbin (2003) and McKibbin and Sidorenko (2006) to convert different assumptions about mortality rates and morbidity rates in the country where the disease outbreak occurs (the epicenter country).

Results

Model validation

We find a good fit between the values predicted by our algorithm and the reported trade flows on a port-level (correlation coefficient between 0.52—0.96) and a country—level(correlation coefficient between 0.79—0.98), with a general overestimation for smaller ports, and ports and

countries with large trade imbalances(e.g small islands). For the external validation data, we find correlation coefficients of 0.84—0.86 for the aggregated trade data and 0.73---0.78 for the sector—specific trade data(on a country level). Again, smaller trade flows are harder to predict. The accuracy of the method is also found to be dependent on the coverage of information in the AIS data (some attributes are manually put in), especially information on the vessel draft, which is less frequently reported in developing countries.

Port –level trade flows

In the first eight month of 2020, the number of port calls across all ports reduced by 4.4% compared to the same month in 2019. Fig 1A shows average change in total trade (imports + exports) in terms of volume (in million tones, MT) over the month January –august. The vast majority of ports have experienced a decline in total trade, although a number of ports in brazil, the gulf of mexico region, the middle east , Australia and ports of south korea and the Philippines have seen an increase in trade in 2020 relative to 2019. The top 20 port with the largest changes in volume in terms of total trade, imports and exports are included in table 1. The ports with the largest absolute changes in volume are the ports of Ningbo (china, -68.5MT), Rotterdam (Netherlands, -43.2MT), Shanghai

(-32.5MT), Wuhan (china, -21.6MT) And Tubarao (brazil, -20.7MT) . the largest changes of imports are found for the ports of Ningbo (china, -43.5MT), Rotterdam (Netherlands, -40.1MT), shanghai

(-22.4MT), Zhoushan (china, 22.4 MT) and Amsterdam (Netherlands, -12.2 MT). These ports, and the other ports in the list, function as major gateway ports for a country to import final products

	Total trade			imports			exports		
Rank	Port	Iso3	Change(MT)	Port	Iso3	Change(MT)	Port	Iso3	Change(MT)
1	Ningbo	CHN	-68.5	ningbo	CHN	-43.5	ningbo	CHN	-25.0
2	Rotterdam	NLD	-43.5	Rotterdam	NLD	-40.1	tubarao	BRA	-17.1
3	Shanghai	CHN	-32.5	Shanghai	CHN	-22.4	novorossiysk	RUS	-11.5
4	Wuhan	CHN	-21.6	Zhoushan	CHN	-13.8	wuhan	CHN	-10.9
5	Tubarao	BRA	-20.7	Amsterdam	NLD	-12.2	Beaumont	USA	-10.6
6	Zhoushan	CHN	-18.8	Rizhao	NLD	-11.3	Dampier	AUS	-10.2
7	Amsterdm	NLD	-17.4	Wuhan	CHN	-10.7	Shanghai	CHN	-10.1
8	shekou	CHN	-14.2	Mina Al Ahmadi	CHN	-9.5	Haypoint	AUS	-9.2
9	Hong kong	HKG	-12.3	vlissingen	KWT	-8.5	Lumut	MYS	-7.6
10	vlissingen	NLD	-12.2	Zhanjiang	NLD	-7.6	Shekou	CHN	-7.5
11	Singerpore	SGP	-12.1	Ummsaid	CHN	-7.4	Tianjin	CHN	-7.3
12	Rizhao	CHN	-11.7	Yokohama	QAT	-7.3	Fujairah	ARE	-7.2
13	novorossiysk	RUS	-11.7	Gent	JPN	-7.1	Tangshan	CHN	-6.3
14	lumut	MYS	-11.6	Singapore	BEL	-6.8	Xiamen	CHN	-6.1
15	Dampier	AUS	-10.8	Hong kong	SGP	-6.7	Itaqui	BRA	-5.8
16	Yokohama	JPN	-9.9	shekou	HKG	-6.7	Bohai bay	CHN	-5.7
17	Haypoint	AUS	-9.7	krishnapatnam	CHN	-6.7	Puarto bolivar	COL	-5.7
18	Beaumont	USA	-9.5	Magdalla	IND	-6.6	Hong kong	HKG	-5.6
19	Ghent	BEL	-9.4	Port of le havre	FRA	-6.4	primorsk	RUS	-5.5
20	zhanjiang	CHN	-9.1	Newyork-new jersy	USA	-6.0	Richard bay	ZAF	-5.4

Discussion and conclusion:

We present a near-global analysis of maritime trade indicators based on empirical vessel tracking data, which we use as a high-frequency indicator of economic activity. We illustrate how the implementation of NPI have resulted in large trade losses with a strong geographical and sectoral heterogeneity, with individual NPI affecting the economy in different ways .

Our estimate of a 4.4% reduction in global ports calls for the first eight months of 2020 is lower than the 8.7% predicted by UNCTAD for the first six months. The main reason for this difference is associated with the inclusion of different vessel types. Whereas we include only the main trade-carrying vessels, the UNCTAD analysis also included passengers vessels (66% of total port calls), which have seen the largest drop in port calls (-17% for passenger vessels). Moreover, the sector-level trends we found are in line with the sector – level impacts(based observed trade data of china, the European union and the united states) for the first quarter(Q1) of 2020 as presented in the UNCTAD analysis, that stated that in particular the automotive industry (-8%), machinery (-8%), office machinery (-8%) and textiles and apparel(-11%) are particularly hit.

Overall, all results should be interpreted with caution, as many factors could potentially influence this causal relationships. For instance, temporal increases in maritime transport during some periods of the pandemic could be driven by the large increase in trade of medical supplies (e.g PPE) and mode substitution from air to maritime, irrespective if policies were imposed during these periods. Therefore, testing alternative economic indicators, such as data on mobility, energy consumption and nitrogen emissions, as done in Deb et al.(5), can help support these findings.

In short, our analysis of the economic implications of introducing NPI into society can help evaluate the cost-benefit of the different NPI, which may help government construct effective portfolios of policies as many countries enter a second or third wave of COVID-19 cases(46).

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