The Performance of Value Chains During the Pandemic: Evidence from Bangladesh

Reshad N Ahsan
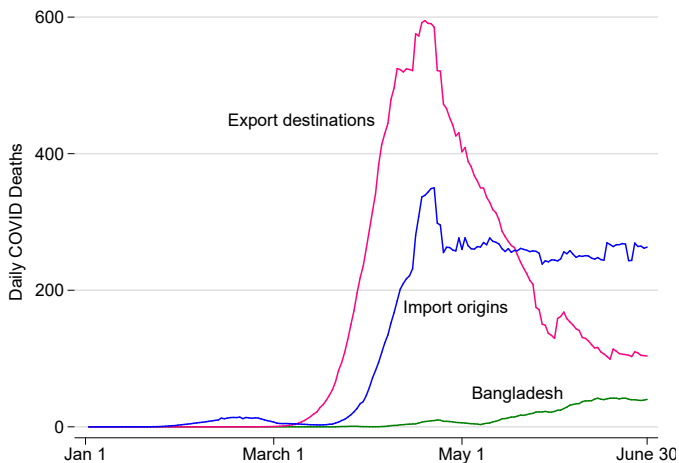U. Melbourne

Kazi Iqbal
BIDS

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Trade During the Pandemic: Projection vs. Reality

- ▶ The pandemic was expected to lower international trade by 13–32% in 2020 (WTO) but the actual decline was 5.3%.

- ▶ Why was the initial projection so dire?
  - ▶ Modern trade via geographically-fragmented value chains exposes firms to significant risk.
  - ▶ Asynchronous production shutdowns make it more expensive to acquire imported inputs (Baldwin, 2020).

- ▶ Fear of the latter led to concern that global value chains were no longer 'fit for purpose'.

Decomposing the Effect on Trade

- **Data:** we use the universe of firm-level, export-import linked data from Bangladesh during 2019-2020 to decompose the COVID shock into a
    1. demand shock due to COVID in destination markets and
    2. a supply-chain shock due to COVID in origin countries.

- **Identification:** exploit across destination/origin- and quarter-variation in COVID exposure to identify effect on firm-level exports.

- **Result:** supply-chain shocks played a comparatively modest role. Export reduction was driven by an adverse demand shock.

Bangladesh's Trade-Based COVID Exposure in 2020

Notes: COVID deaths per million for Bangladesh, its top-10 export destinations, and its top-10 import origin countries. Source: European Center for Disease Control.

Data

- ▶ COVID data are from the European Center for Disease Prevention and Control.
    - ▶ Default measure: quarterly deaths per million in destination/origin.

- ▶ Transaction-level trade data from January, 2019 to June, 2020.
    - ▶ Universe of daily trade data by firm, which we aggregate to the quarterly level.
    - ▶ Unique firm identifiers allow us to <u>link</u> export data to import data.

    ▸ Summary Statistics   ▸ Input Definition

COVID-19 and Exports: Channels

- ▶ Export-demand shock
  - ▶ Large declines in consumer spending in the OECD in H1, 2020 (Anderson *et al.* 2020; Baker *et al.*, 2020; Bounie *et al.*, 2020; Carvalho *et al.*, 2020; Chetty *et al.* 2020; Chronopoulos *et al.* 2020; Dunn *et al.* 2020).

- ▶ Supply-chain shock
  - ▶ Early disease spread and lockdown in China.
  - ▶ Over 50 countries have changed port procedures $\longrightarrow$ increased port clearance times (OECD, 2020a).

- ▶ Domestic lockdowns
  - ▶ 50 out of 57 lockdown days were nationwide $\longrightarrow$ lockdown effects captured by time fixed effects.

Econometric Specification: Both Effects

$$\ln X_{idqt} = \beta_1 \ln \delta_{dqt} + \beta_2 \ln c_{iqt} + \theta_{idq} + \theta_{dt} + \varepsilon_{idqt}, \tag{1}$$

- where δ_{dqt} is the demand shock (COVID deaths in destination).

- $c_{iqt} = \sum_o \left(sh_{io}^M \times I_{oqt} \right)$ is the supply-chain shock.

- θ_{idq} captures all time-invariant i, d, and q-specific characteristics and

- θ_{dt} all time-varying d characteristics.

Export Demand vs. Supply-Chain Effects

	(1)	(2)	(3)
Dependent variable		ln(exports)	
ln(supply-chain shock)	-0.075**	-0.033	-0.089
	(0.034)	(0.035)	(0.065)
ln(deaths in destination)		-0.102***	-0.125***
		(0.022)	(0.029)
ln(deaths) $\times$ ln(supply-chain)			0.015
			(0.011)
Observations	27,226	27,226	27,226
R-squared	0.847	0.848	0.848

Notes: robust standard errors in parenthesis are two-way clustered at the exporter and destination levels in all columns. *** $p<0.01$, ** $p<0.05$, * $p<0.1$.

▶ A firm that exported exclusively to the U.S. experienced a 22.81% decline in exports compared to a firm that exported exclusively to Germany.

Why Wasn't the Supply-Chain Effect Stronger?

1. The declining imports was due to declining output alone.

2. Import diversion to less COVID impacted origin countries.

	(1)	(2)
Dependent variable	M/X	ln(exports)
ln(deaths in origin)	-0.007	-0.123***
	(0.022)	(0.034)
ln(deaths in other countries)		0.050**
		(0.021)
Observations	12,648	12,710

Notes: robust standard errors in parenthesis are two-way clustered at the importer and origin levels. *** $p<0.01$, ** $p<0.05$, * $p<0.1$.

Additional Results

- Margins of adjustment ▸ Table
- Alternate proxies for COVID infections ▸ Table

Conclusion

▶ We provide quantitative evidence of the international spillover effect of COVID via demand and supply channels.

▶ Our results suggest that for Bangladesh, the spillover effect was driven by a reduction in demand in COVID-affected countries.

▶ Two important implications
   1. Failure to control COVID-19 had adverse international spillover effects.
   2. Supply-chain disruptions were not the culprit. Hence a restructuring towards shorter, less fragmented, and more regional GVCs may not be inevitable.