COVID-19 vs. GFC: A Firm-level Trade Margins Analysis Using Kenyan Data

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ASSA 2023

Presentation Outline

Research issue

- Both COVID-19 and global financial crisis (GFC) have catalyzed the great trade collapse

GFC

- Nature: Financial
- Disruption international trade: Demand-side shocks as corporate investment and consumption of durables $\downarrow$
- Minor supply-side (access to credit & protectionism) effects

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COVID-19

- Nature: Health
- Disruption international trade: Trade financing, demand-side shocks, supply-side shocks, & substitution and contagion effects

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- COVID-19 deemed to have had a more direct effect on international trade in developing countries than GFC

Study focus

- Compare the two recessions at a firm-level from an international trade perspective
  - Also done by Büchel et al. (2020) in Switzerland, Du and Shepotylo (2021) in the UK and Minondo (2021) in Spain but they are largely descriptive and use macro-data

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- Mainly the contribution of the intensive and extensive margins on the monthly mid-point export and import growth rates for the two crises

Research issue

Study focus

- Intensive margin: sales of continuing firms, continuing products and continuing partner countries
- Extensive margin: sales of new firms, new products and new partner countries

- Establish determinants of the mid-point export and import growth during the two crises

Presentation Outline

Our contribution

1. Incorporation of imports in GFC firm-level studies
   - Only aware of Behrens et al. (2013) who have incorporated both exports and imports in Belgium
2. Firm-level analysis for COVID-19
   - Examples of empirical micro papers on trade & COVID-19: Amador et al. (2021)-Portugual, Benguria (2021)-Colombia and Bricongne et al. (2021)-France
3. Expansion of literature on the effect of economic crises on trade in developing countries
   - Kenya-specific litearture largely descriptive & @macro-level

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Some stylized facts

1. Trade collapse severer under GFC than the COVID-19 period
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2. Intensive margin plays a bigger role in the variation of trade than the extensive margin during crises
   - Examples from the US (Bernard et al., 2009), Belgium (Behrens et al., 2013; Ariu, 2016), France (Bricongne et al., 2012), South Africa (Matthee et al., 2016), China (Manova et al., 2015; Chen et al., 2021), Spain (Minondo, 2021) and Colombia (Benguria, 2021)

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3. Determinants of trade growth vary by firm, product and partner-country characteristics during crises
   - Firms (size, ownership), country (exch. rate, GDP, agreements) & product (intermediate, capital and consumer durable)

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Data

Trade, GFC and COVID-19 Data

- HS-8 digit customs import and export data for Kenya (January 2006-June 2020) from the Exporter Dynamics Database (Fernandes et al., 2016)
- GFC (September 2008-August 2009) & COVID-19 (January 2020-June 2020)

Mid-point growth model

- Follows Davis & Haltiwanger (1992) and Bricongne et al. (2012)

$$g_{icpt} = \frac{y_{icpt} - y_{icp(t-12)}}{\frac{1}{2}\left(y_{icpt} + y_{icp(t-12)}\right)} \tag{1}$$

where g-mid-point growth rate, i-firm, t-monthly, y-export/import flow,p-product & c-partner-country

- Year-on-year growth rate of the total value of export or import trade is given by summing each individual flow g_{icpt} weighted by the relative share in total exports by the population of exporters (importers) in Kenya

$$G_t = \sum_c \sum_i \sum_p S_{icpt} * g_{icpt} \tag{2}$$

- Intensive +/- & extensive +/-

Descriptive statistics

Table 1: **Contributions to mid-point growth rates, Kenya monthly exports and imports**

	Export			**Import**		
	Sample	**GFC**	**COVID-19**	**Sample**	**GFC**	**COVID-19**
Net intensive margin	1.97	-3.19	3.16	1.99	-6.21	-8.68
Intensive positive	22.62	21.83	23.99	17.15	12.98	14.72
Intensive negative	-20.65	-25.02	-20.83	-15.15	-19.19	-23.41
Net extensive margin	1.62	-1.84	-6.89	4.45	10.10	-9.27
Net firm	1.53	-1.38	-4.93	2.84	5.78	-0.80
Firm entry	11.42	7.76	8.44	17.83	18.01	14.92
Firm exit	-9.90	-9.14	-13.37	-14.99	-12.23	-15.72
Net country	-0.49	-0.50	-0.13	2.03	6.32	-5.27
Country entry	14.58	13.39	10.81	25.31	30.77	17.64
Country exit	-15.07	-13.89	-10.94	-23.28	-24.45	-22.91
Net product	0.59	0.03	-1.83	-0.42	-2.00	-3.20
Product entry	6.32	7.36	4.68	14.78	11.90	12.44
Product exit	-5.73	-7.33	-6.51	-15.20	-13.90	-15.64
Total growth	3.59	-5.04	-3.73	6.44	3.89	-17.96

Note: Sample period runs from January 2006 to June 2020. GFC is set between September 2008 to August 2009, while COVID-19 spans from January 2020 to June 2020.

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$$g_{icpt} = \alpha_{icp} + \gamma_{it} + \delta_{pt} + \varphi_{ct} + \beta.Crisis.X_{icpt} + \varepsilon_{icpt} \quad (3)$$

$$g_{it} = \alpha + \beta_1 Aid_{it} + \beta_2 Settlers_{it} + \beta_3 (Aid * Settlers)_{it} + \sum_{j=1}^{m} \gamma_j X_{j,it} + \sum_{k=1}^{n} \delta_k D_{k,it} + u_{it}$$

Table 2: **Effect of GFC and COVID-19 on firm-level export and import mid-point growth**

	Export		**Import**	
Variable	**GFC**	**COVID**	**GFC**	**COVID**
Crisis	-1.582***	-1.803***	-1.657***	-2.091***
	(0.011)	(0.013)	(0.006)	(0.006)
Firm x Product x Destination F.E.	Yes	Yes	Yes	Yes
Obs.	291,581	159,065	825,393	669,608
R-squared	0.37	0.45	0.33	0.44

Notes: Std. errors in (.).Significance levels: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. GFC (September 2007-August 2008 September 2008-August 2009) and COVID-19 (January 2019-June 2019-January 2020-June 2020)

$$g_{icpt} = \alpha_{icp} + \gamma_{it} + \delta_{pt} + \varphi_{ct} + \beta.Crisis.X_{icpt} + \varepsilon_{icpt} \quad (3)$$

Table 3: **Effect of GFC and COVID-19 on firm-level export and import mid-point growth: Firm determinants**

	Export		**Import**	
Variable	**GFC**	**COVID**	**GFC**	**COVID**
Crisis x Large	1.672***	1.851***	2.265***	2.288***
	(0.038)	(0.043)	(0.020)	(0.016)
Crisis x Medium	1.239***	1.112***	1.501***	1.339***
	(0.030)	(0.032)	(0.018)	(0.015)
Firm x Product x Destination F.E.	Yes	Yes	Yes	Yes
Product x Month F.E.	Yes	Yes	Yes	Yes
Destination x Month F.E.	Yes	Yes	Yes	Yes
Obs.	272,788	149,898	805,488	661,233
R-squared	0.52	0.58	0.44	0.52

Notes: Std. errors in (.).Significance levels: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. GFC (September 2007-August 2008 September 2008-August 2009) & COVID-19 (January 2019-June 2019-January 2020-June 2020). Large- top 1 percentile of total exports (imports) & medium- 1 & 20 percentile.

$$g_{icpt} = \alpha_{icp} + \gamma_{it} + \delta_{pt} + \varphi_{ct} + \beta.Crisis.X_{icpt} + \varepsilon_{icpt} \quad (3)$$

Table 4: **Effect of GFC and COVID-19 on firm-level export and import mid-point growth: Product determinants**

	Export		Import	
Variable	**GFC**	**COVID**	**GFC**	**COVID**
Crisis x Intermediate	-0.226***	-0.219***	0.027	0.043*
	(0.034)	(0.045)	(0.018)	(0.018)
Crisis x Final	-0.234***	-0.224***	-0.060**	0.011
	(0.034)	(0.044)	(0.019)	(0.019)
Crisis x Capital	-0.277***	-0.356***	-0.042*	-0.067***
	(0.044)	(0.059)	(0.020)	(0.020)
Crisis x Differentiated	-0.073**	-0.148***	-0.224***	-0.208***
	(0.025)	(0.035)	(0.017)	(0.016)
Firm x Product x Destination F.E.	Yes	Yes	Yes	Yes
Firm x Month F.E.	Yes	Yes	Yes	Yes
Destination x Month F.E.	Yes	Yes	Yes	Yes
Obs.	269,471	142,056	726,757	608,959
R-squared	0.60	0.70	0.60	0.65

Notes: Std. errors in (.).Significance levels: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. GFC (September 2007-August 2008 September 2008-August 2009) and COVID-19 (January 2019-June 2019-January 2020-June 2020). Differentiated based on Rauch (1999)

$$g_{icpt} = \alpha_{icp} + \gamma_{it} + \delta_{pt} + \varphi_{ct} + \beta.Crisis.X_{icpt} + \varepsilon_{icpt} \quad (3)$$

Table 5: **Effect of GFC and COVID-19 on firm-level export and import mid-point growth: Country determinants**

	Export		Import	
Variable	**GFC**	**COVID**	**GFC**	**COVID**
Crisis x Africa	0.135	0.747*	0.551***	1.880***
	(0.175)	(0.328)	(0.106)	(0.532)
Crisis x Europe	-0.248*	0.468**	-0.319***	-0.059
	(0.109)	(0.171)	(0.049)	(0.154)
Crisis x Asia	-0.130	0.143	-0.355***	0.173
	(0.140)	(0.216)	(0.054)	(0.152)
Crisis x EIA	0.282**	-0.234	0.110*	0.086
	(0.108)	(0.163)	(0.054)	(0.124)
Crisis x Distance	-0.233*	-0.340	0.110	0.388*
	(0.109)	(0.226)	(0.073)	(0.156)
Crisis x ER Change	-0.038*	0.088*	-0.049***	0.040
	(0.017)	(0.035)	(0.009)	(0.030)
Crisis x Net Import	0.073*	0.090*	-4.476***	-1.442
	(0.030)	(0.046)	(0.466)	(0.905)
Firm x Product x Destination F.E.	Yes	Yes	Yes	Yes
Firm x Month F.E.	Yes	Yes	Yes	Yes
Product x Month F.E.	Yes	Yes	Yes	Yes
Obs.	57,035	19,240	381,568	100,597
R-squared	0.74	0.78	0.69	0.76

Notes:Std. errors in (.).Significance levels: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. GFC (September 2007-August 2008 September 2008-August 2009) and COVID-19 (January 2019-June 2019-January 2020-June 2020). Net import=Destination's total imports-Kenya's exports.Net export=Kenya's total imports-Kenya's trade partner's bilateral exports to Kenya

Presentation Outline

Key findings

1. $\downarrow$ exports during the GFC while the extensive margin was responsible for the $\downarrow$ of exports under COVID-19
2. Imports are mainly driven by the extensive margin which $\uparrow$ during GFC but $\downarrow$ during the pandemic. $\downarrow$ in the intensive and extensive margins was almost symmetrical during the pandemic
3. $\downarrow$ in export and import mid-point growth was larger during the COVID-19 pandemic than GFC. determined by several factors

Thank You