

Adjusting to Economic Sanctions

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 **Lara Mariowe** Paris Correspondent

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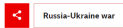


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tougher measures against hecklers...

The Event We Investigate

- ▶ Russia-Ukraine conflict in 2014 led to political tensions between Russia and EU
 - ▶ EU financial sanctions on certain individuals in Russia
 - ▶ Response measures by Russia to **ban of imports** of agricultural, food product and certain raw materials (meats, dairy products, fruits, vegetables, etc.) from the EU, the US and some other countries in **August 2014**
 - ▶ Initially announced for one year but then extended annually

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 - ▶ Initially announced for one year but then extended annually
- ▶ Lithuania (part of EU) - **small open economy**:
 - ▶ Exports make 80% of its GDP
 - ▶ Russia has been one of the main trade partners for Lithuania's agricultural and food product exports
 - ▶ 20% of Lithuania's exports were directed to Russia
 - ▶ 18% of them were banned product exports
 - ▶ **Food manufacturing sector** affected most

Focus of Our Study

- ▶ **Firm responses** to a strong negative demand shock - adjustments **along a number of dimensions**
 - ▶ How and when do such adjustments **interact and reinforce** each other?
 - ▶ Is the **heterogeneity** of the adjustments limited to non-uniform adjustment costs and expectations of the demand shock permanence?
 - ▶ Are the changes limited to cost/input adjustments? How do firms switch to **revenue adjustments**?

Related Literature

- ▶ Firm adjustments to trade shocks, mostly partial equilibrium:
 - ▶ Labor margin adjustments (Hogan and Ragan (1995), Mouelhi (2007), Fabiani et al. (2015), Asquith et al. (2019), Tanaka et al. (2019), Egger et al. (2020)); general equilibrium effects (Dix-Carneiro and Kovak 2019, Dix-Carneiro 2014, Caliendo et al. 2019, Dix-Carneiro et al. 2018)
 - ▶ Trade adjustments (Kee and Krishna (2008), Bernard et al. (2009) or Morales et al. (2019))
 - ▶ Multiple adjustment margins (Bernard et al. (2006), Eslava et al. (2010), Bertola et al. (2012), Casacuberta and Gandelman (2012))
- ▶ Effects of trade bans, or severe trade restrictions:
 - ▶ US-China trade war (Selmi et al. 2020, Fusacchia 2020, Hanson 2020, Fajgelbaum et al. 2022)
 - ▶ Russia-EU trade sanctions (Crozet and Hinz 2016, 2020, Klomp 2020, Crozet et al. 2021)

Additions to the Literature

- ▶ Trade shocks are likely to be correlated with other economic adjustments or expectations; our paper presents a **cleanly identified demand shock** (sudden, unanticipated and abrupt) when the trade stops completely, holding other economics factors constant
- ▶ Quite a bit is known about firm adjustments to trade liberalizations but: **Liberalizations = – Sanctions?**
- ▶ Something is known about trade restrictions that affect firm adjustments on the intensive margin but how do firms adjust **alongside several dimensions**; how do they choose the adjustment margins and their sequence?

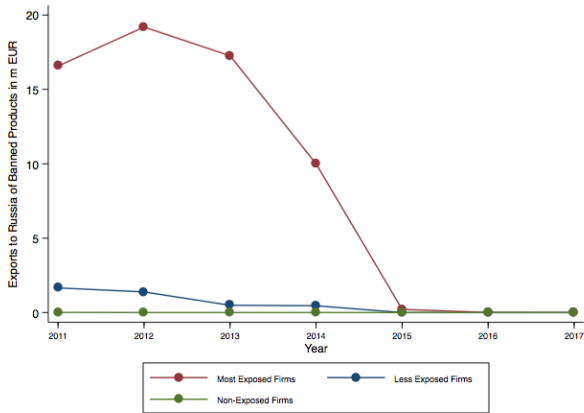
Main Results

- ▶ We build an internally consistent **conceptual framework** to explain the empirical findings and derive new predictions:
 - ▶ Part-time labor, as the most flexible margin, adjusts first
 - ▶ Firms also revert to more active export redirection, if the shock is large
 - ▶ A larger and persistent shock leads to full-time labor and capital changes
 - ▶ **Part-time labor** adjustment also serves as characteristic of **shock severity** for the firm, **capturing unobservable parameters**

EMPIRICAL EVIDENCE

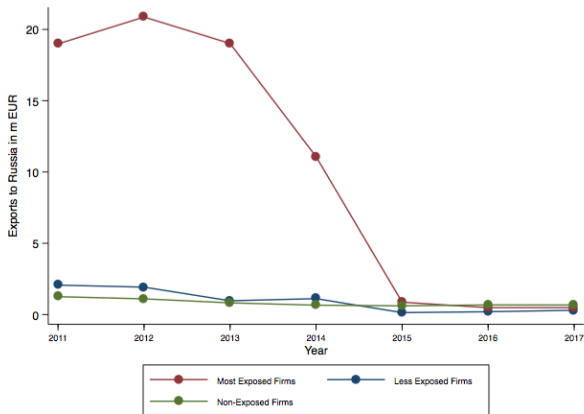
Exports to Russia of Banned Products

- ▶ Banned product exports by the food manufacturing sector firms to Russia went virtually to zero:



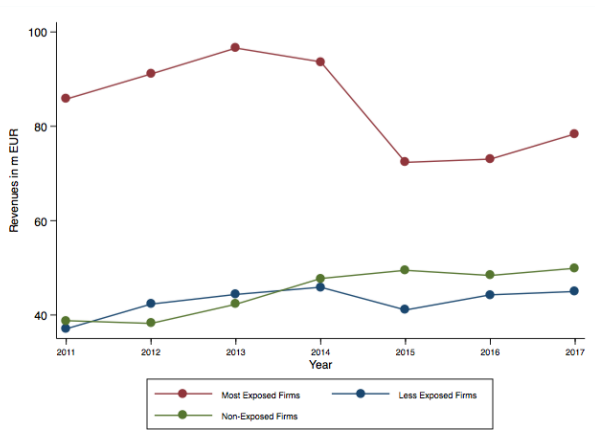
Total Exports to Russia

- ▶ Sanctions also completely cut food manufacturing sector's total exports to Russia:



Total Revenues

- ▶ That resulted in a drop in **total revenues of food manufacturing firms** (even if with a minor rebound later):



Empirical Strategy

- ▶ Dataset - all firms in the economy:
 - ▶ Disaggregated balance sheet data
 - ▶ Detailed trade data by partner country, 8-digit HS product level
- ▶ Treated firms:
 - ▶ Food manufacturing firms that had banned product exports to Russia in 2013
- ▶ Control firms (for each treated firm):
 - ▶ Food manufacturer that is also an exporter
 - ▶ Firm, closest in size (total sales in 2013) to the treated firm
- ▶ Essentially, a triple-difference estimate of the import ban effects on treated firms in 2014-2017:
 - ▶ as compared to 2011-2013
 - ▶ as compared to the respective changes in control firms
 - ▶ as compared to the respective changes in changes in corresponding firms with a smaller *Banned export share*

Main Specification

- ▶ Reduced form **difference-in-differences** estimation:

$$\Delta Y_{i,t} = \beta_1 \times \text{Banned export share}_i \times \text{Post2014}_t + \gamma_i + \tau_t + \epsilon_{i,t}$$

- ▶ $\Delta Y_{i,t}$: difference in the adjustment margin $Y_{i,t}$ (**part-time employees, full-time employees, investment, exports to other markets but Russia**), where the difference is taken between the values of treated and the control groups
- ▶ *Banned export share_i*: % of firm i 's exports of the banned products to Russia in 2013 over its total sales in 2013
- ▶ *Post2014_t*: dummy equal to 1 in the years 2014-2017 and equal to 0 in years 2011-2013
- ▶ γ_i and τ_t : firm- and year-fixed effects

Part-time Employees

	(1)	(2)
Banned export share × Post 2014	-146.909*** (50.223)	-125.123** (48.105)
Banned export share × Post 2016		-56.133 (52.725)
Constant	24.411*** (4.478)	24.378*** (4.474)
R ²	0.755	0.757
N	151	151

- ▶ Average exposed firm with 6.69% *Banned export share* reduced part-time employees by ~10 (compared to the change in control firms), a 67% drop over the pre-period sample mean

Exports Outside of Russia

	(1)	(2)
Banned export share x Post 2014	46.042** (20.687)	19.626 (24.308)
Banned export share x Post 2016		54.657* (30.436)
Constant	-9.581*** (1.799)	-9.566*** (1.807)
R ²	0.889	0.892
N	165	165

- ▶ Dollar value export adjustments to other countries than Russia.

Investment

	(1)	(2)
Banned export share x Post 2014	-24.459** (11.235)	-26.798* (13.657)
Banned export share x Post 2016		6.103 (14.727)
Constant	-0.926 (1.609)	-1.274 (1.772)
R ²	0.596	0.597
N	126	126

- ▶ A drop in investment for the food manufacturers

Full-time Employees

	(1)	(2)
Banned export share x Post 2014	-384.578** (177.502)	-128.022 (159.867)
Banned export share x Post 2016		-661.058** (314.478)
Constant	141.696*** (16.923)	141.306*** (17.150)
R ²	0.953	0.956
N	151	151

- ▶ Average exposed firm with 6.69% *Banned export share* reduced full-time employees by ~26 (compared to the change in control firms), a 6.8% drop over the sample mean

CONCEPTUAL FRAMEWORK

Assumptions

- ▶ CES demand structure + Cobb-Douglas production function over part-time employment, capital and full-time labor
- ▶ We adopt a simplified version of Helpman et al. (2010), where a firm exports its varieties in addition to selling on a domestic market
- ▶ Our point of deviation includes firm-specific variable trade costs, e.g., reflecting efficiency in transporting goods, accessing customs, managing distribution network
- ▶ Another extension is a possibility to export to Russia as well as to the rest of the world, rather than one foreign country

Firm's Problem

- ▶ In a perfect foresight environment, a firm is *forward-looking* and its profit maximization problem cannot be split into static sub-problems due to *adjustment costs*
- ▶ A firm faces different adjustment margins
 - ▶ *Part-time employees* can be changed most quickly
 - ▶ Reflecting institutional setup, a firm is required to pay a *severance payment* when firing full-time labor, ending up in non-convex adjustment costs
 - ▶ Capital depreciates and *investment takes time*, implying that next period's capital requires adjusting investment in the current period
- ▶ The demand shock is modelled as a sharp *increase in variable trade cost* with Russia

Testable Implications, I

Proposition (1)

An exogenous *increase in trade costs* with Russia induces *layoffs of part-time employees*.

This effect is larger the *larger fixed exporting costs* and the *lower variable exporting costs* (and thus the larger export basket) to Russia had been before a shock.

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Proposition (2)

The *larger* is the relative *trade shock*, the larger is the *adjustment* in the revenue share of *the rest of the world*.

Testable Implications, II

Proposition (3)

A forward-looking firm *reduces investment* proportionally to a forthcoming *drop in part-time employment*.

Testable Implications, II

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A forward-looking firm *reduces investment* proportionally to a forthcoming *drop in part-time employment*.

Proposition (4)

The *layoffs of full-time labor* are more likely, the are *higher variable firm's costs* to trade with the rest of the world and the smaller is the *stock of part-time employment*.

Role of Part-time Labor

- ▶ Heterogeneity of firm adjustments due to **various unobservable characteristics** hard to estimate empirically: variable exporting costs, time preference, expected probability of the shock persistence, and various adjustment costs
- ▶ Yet, it can be captured by how strongly the firm adjusts on its flexible adjustment margin – **change in the part-time labor**

Role of Part-time Labor

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- ▶ Yet, it can be captured by how strongly the firm adjusts on its flexible adjustment margin – **change in the part-time labor**
- ▶ Empirically: additional interaction of the change in part-time employees over 2014-2015 to our dynamic specification:

$$\begin{aligned}\Delta Y_{i,t} = & \beta_1 \times \text{Banned export share}_i \times \text{Post2014}_t + \\ & \beta_2 \times \text{Banned export share}_i \times \text{Post2016}_t + \\ & \beta_2 \times \text{Banned export share}_i \times \Delta \text{Parttimechange} \times \text{Post2016}_t + \\ & \gamma_i + \tau_t + \epsilon_{i,t}\end{aligned}$$

Role of Part-time Labor – Result

	(1)	(2)
	Δ FT_empl.	Δ Inv.
Banned exp. share x Post 2014	-128.022 (154.568)	-26.798* (13.679)
Banned export share x Post 2016	-484.914* (271.284)	7.230 (15.670)
Δ Part-time x Post 2016	-0.896 (1.379)	-0.097 (0.077)
Banned exp. share x Δ Part-time x Post 2016	22.104*** (7.738)	0.744* (0.408)
Constant	142.967*** (15.420)	-1.056 (1.839)
R ²	0.963	0.603
N	149	125

Role of Trade Diversion

- ▶ Can the firms do something else when faced with the shock?
- ▶ We test for the firms' ability to adjust towards **finding new export markets**
- ▶ Empirically: additional interaction of the change in dollar value of exports outside of Russia between 2013 and 2014 to our dynamic specification:

$$\begin{aligned}\Delta Y_{i,t} = & \beta_1 \times \text{Banned export share}_i \times \text{Post2014}_t + \\ & \beta_2 \times \text{Banned export share}_i \times \text{Post2016}_t + \\ & \beta_2 \times \text{Banned export share}_i \times \Delta \text{NonRu export change}_i \times \\ & \text{Post2016}_t + \gamma_i + \tau_t + \epsilon_{i,t}\end{aligned}$$

Role of Trade Diversion – Result

	(1) Full-time empl.
Banned exp. share \times Post 2014	-128.022 (163.557)
Banned export share \times Post 2016	-546.798** (261.905)
Δ NonRu exports (2013-2014) \times Post 2016	-0.951 (1.053)
Banned exp. share \times Δ NonRu exports (2013-2014) \times Post 2016	25.454* (13.311)
Constant	142.975*** (16.655)
R ²	0.958
N	149

Takeaways and Conclusions, I

- ▶ A major sector of a small open economy **lost its main export market** for reasons unrelated to economic conditions
- ▶ We apply reduced form **difference-in-differences strategy** to quantify the adjustment margins: part-time and full-time labor, investment, new export markets
- ▶ We then build an internally consistent **conceptual framework** to explain the empirical findings and derive **new predictions**:
 - ▶ **Part-time labor**, as the most flexible margin, adjusts **first**
 - ▶ Firms also revert to more active **export redirection** to the rest-of-the-world, if the shock is large
 - ▶ Due to forward-looking behavior **investment** is reduced **straight-away** (front-loading future costs)
 - ▶ A larger and persistent shock leads to a delayed **full-time labor change**

Takeaways and Conclusions, II

- ▶ Adjustments **start** on the margin with **no adjustment costs** – part-time labor and **continue onto less flexible** and more costly adjustment margins

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- ▶ Adjustments **start** on the margin with **no adjustment costs** – part-time labor and **continue onto less flexible** and more costly adjustment margins
- ▶ **Part-time labor** adjustment also serves as characteristic of **shock severity** for the firm, **capturing unobservable parameters**
- ▶ **Economic policies** of more flexible labor market or international trade support schemes could help ameliorate the shock effects:
 - ▶ Effective and accessible **training policies**, and labor market regulation admitting different types of work contracts
 - ▶ **Subsidizing wage costs** would reduce the shadow cost of labor and thus could prevent the lay-offs
 - ▶ **Trade infrastructure** to direct more products to existing and new foreign markets can help absorb trade shocks

THANK YOU