

# Competition and the Gender Pay Gap: Evidence from the Russian Trade Withdrawal

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# Motivation

Growing evidence consistent with Becker's theory of taste-based discrimination:

The relative position of women improves when product market competition **increases** thanks to

- Deregulation of industries (Black and Strahan, 2001; Cooke et al., 2019)
- Improved trade openness in Central and Eastern Europe (Brainerd, 2000; Lovasz, 2008), in the US (Black and Brainerd, 2004; Benguria and Ederington, 2017; Brussevich, 2018), and Sweden (Heyman et al., 2013)
- Decrease in trade tariffs (Ederington et al. 2010; Juhn et al., 2014; Aguayo-Tellez et. al, 2014; Wang et al. 2024)

# Motivation

Little evidence on the effects of a **decline** in competition

Possibly different mechanisms at work due to:

- Adoption of more efficient management practices (Heyman et al., 2013)
- Formation of fairness norms (Akerloff and Yellen, 1990)

⇒ No effect on the gender pay gap?

# This Paper

## Research Question

What is the impact of a decline in product market competition on the gender pay gap?

Main source of variation: sanctions imposed by Russia on its imports

Contribution:

- Novel source of exogenous variation for gender gap analysis
- Sharp change in competition compared to more gradual variation caused by opening up to trade

# Embargo 2014

In 2014, Russia embargoes 7% of its imports, affecting 57% of trading partners

- Almost no effect of the export sanctions (Belín and Hanousek, 2021)
- Increase in risk leading to an overall decline in trade, even for non-sanctioned goods (Crozet and Hinz, 2020)
- Decrease in imports worsened by the elimination of small firms (Miromanova, 2019)
- No substitution effect (Miromanova, 2019)

# Data: Competition

## Measures:

- *Import Penetration Ratio* =  $\frac{Import}{GDP - Export + Import}$
- *Import Share* =  $\frac{Import}{GDP}$

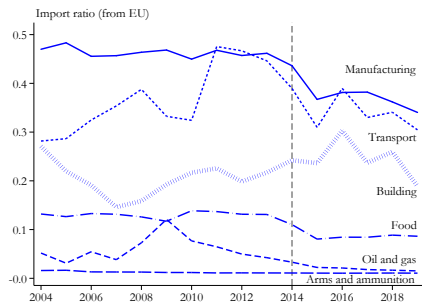
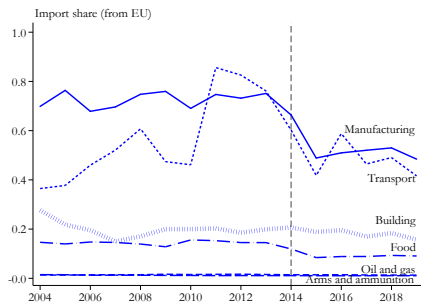
## Data:

- Industry level (6 industries)
- From 2011 to 2019

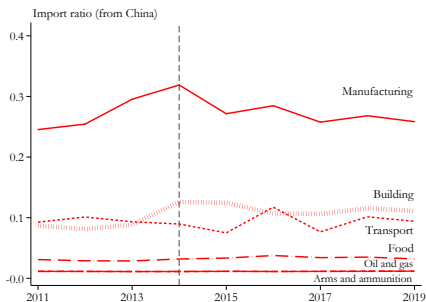
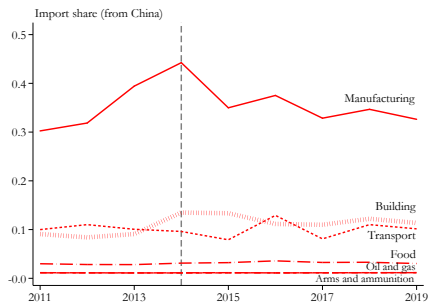
## Sources:

- Import/Export Data - Eurostat/WITS
- Value Added - Rosstat
- Exchange rates - OECD

# Data: Competition - Import from Europe



# Data: Competition - Import from China





# Regional Transformation

Following Acemoglu et al. (2016):

## Regional Import

$$Import_{rt} = \sum_{j=1}^N \frac{L_{jrt}}{L_{rt}} Import_{jt}$$

- $Import_{rt}$  - import decline intensity in region  $r$  in year  $t$ ,
- $L_{jrt}$  - employment in industry  $j$  in region  $r$  in year  $t$
- $L_{rt}$  - overall employment in region  $r$  in year  $t$
- $Import_{jt}$  - the import variable in industry  $j$  and year  $t$

# Data: Individual level

## Earnings data

Russian Longitudinal Monitoring Survey — Higher School of Economics (RLMS-HSE)

- Individuals aged 18-55
- Full-time workers: at least 30 hours per week

## Employment data

Rosstat

- Employment shares by industry (biannual)
- Employment shares by region

# Data: Earnings

	# of obs	Share of females	Mean Male log earnings	Mean Female log earnings
2011	1106	0.32	9.23	8.91
2012	1308	0.33	9.43	9.11
2013	1464	0.32	9.60	9.28
2014	1502	0.32	9.77	9.47
2015	1581	0.31	9.97	9.67
2016	1576	0.30	10.10	9.80
2017	1518	0.31	10.19	9.90
2018	1351	0.30	10.29	9.98
2019	1206	0.30	10.39	10.09

# Gender Gap Definition

## Gender Pay Gap

$$\ln y_{ijt} = \alpha_1 + \gamma_{jt} \text{Male}_i + \beta_1 X_{ijt} + \epsilon_{ijt}$$

$y_{ijt}$  - the logarithm of the earnings

$X_{ijt}$  - observable characteristics (education, occupation, experience, and experience squared)

$\text{Male}_i$  - dummy variable for Male

## Employment Measures

$$\text{Female to Male Ratio}_{jt} = \frac{\# \text{Female Workers in Industry } j \text{ in Year } t}{\# \text{Male Workers in Industry } j \text{ in Year } t}$$

$$\text{Gender Employment Share Gap}_{jt} = x_{jt} - y_{jt}$$

$x_{jt}$  - Share of Men in industry  $j$  among all Men in Year  $t$

$y_{jt}$  - Share of Women in industry  $j$  among all Women in Year  $t$

# Methodology

## Main specification

$$\hat{\gamma}_{jt} = \alpha_{2j} + \eta \textit{Competition}_{jt} + \beta_2 \mathbf{1}[\textit{Year} \geq 2014]_t + u_{jt}$$

- $\hat{\gamma}_{jt}$  - a measure of the gender gap
- $\textit{Competition}_{jt}$  - a measure of competition in industry  $j$  in year  $t$
- $\mathbf{1}[\textit{Year} \geq 2014]_t$  - a dummy for years after 2014.

# Results: Gender Pay Gap and Import from Europe

	Whole Country		East		West	
Panel A: Import Share						
Import share	-0.235** (0.103)	-0.379** (0.159)	-0.095 (0.218)	-0.300 (0.300)	-0.255* (0.129)	-0.462** (0.194)
Constant	0.453*** (0.063)	0.567*** (0.106)	0.343*** (0.124)	0.502** (0.197)	0.489*** (0.071)	0.652*** (0.129)
Panel B: Import Penetration Ratio						
Import penetration ratio	-0.740*** (0.273)	-1.109*** (0.372)	-0.591 (0.546)	-1.177 (0.785)	-0.810** (0.468)	-1.317** (0.436)
Constant	0.607*** (0.109)	0.786*** (0.155)	0.521** (0.211)	0.803** (0.336)	0.657*** (0.018)	0.905*** (0.034)
Industry f.e.	X	X	X	X	X	X
1 (Year after 2014)		X		X		X
Number of obs	54	54	54	54	54	54

# Results: Gender Pay Gap and Import from Europe and China

	Whole country		East		West	
Panel A: Import Share						
Import share (European)	-0.241** (0.100)	<b>-0.436***</b> (0.144)	-0.089 (0.211)	-0.310 (0.272)	-0.269** (0.128)	<b>-0.561***</b> (0.183)
Import share (Chinese)	0.209 (0.734)	0.752 (0.239)	-0.307 (1.238)	0.116 (1.234)	0.405 (0.802)	0.965 (0.737)
Constant	0.385 (0.248)	0.408 (0.249)	0.444 (0.444)	0.470 (0.454)	0.357 (0.264)	0.391 (0.257)
Panel B: Import Penetration Ratio						
Import penetration ratio (European)	-0.747*** (0.270)	<b>-1.312***</b> (0.334)	-0.543 (0.514)	-1.258 (0.751)	-0.822** (0.345)	<b>-1.614***</b> (0.444)
Import penetration ratio (Chinese)	0.100 (1.254)	1.129 (1.357)	-0.819 (2.096)	0.485 (2.154)	0.159 (1.552)	1.596 (1.469)
Constant	0.583* (0.325)	0.582* (0.313)	0.715 (0.597)	0.713 (0.589)	0.620 (0.398)	0.619 (0.380)
Industry f.e.	X	X	X	X	X	X
1 (Year after 2014)		X		X		X
Number of obs	54	54	54	54	54	54

# Results: Employment and Import from Europe

	Female to Male Ratio		Gender Employment Share Gap	
Panel A: Import Share				
Import share	0.179*** (0.039)	0.047 (0.048)	-0.018*** (0.005)	-0.018*** (0.006)
Constant	0.530*** (0.025)	0.630*** (0.034)	0.068*** (0.003)	0.068*** (0.005)
Panel B: Import Penetration Ratio				
Import penetration ratio	0.471*** (0.101)	0.176* (0.098)	-0.042*** (0.012)	-0.044*** (0.015)
Constant	0.450*** (0.041)	0.587*** (0.042)	0.074*** (0.005)	0.075*** (0.007)
Industry f.e.	X	X	X	X
1 (Year after 2014)		X		X
Number of obs	30	30	30	30



# Results: Employment and Import from Europe and China

	Female to Male Ratio		Gender Employment Share Gap	
Panel A: Import Share				
Import share (European)	0.190*** (0.041)	0.034 (0.053)	-0.017*** (0.005)	-0.017** (0.007)
Import share (Chinese)	-0.194 (0.152)	0.137 (0.190)	-0.007 (0.029)	-0.008 (0.029)
Constant	0.588*** (0.052)	0.593*** (0.060)	0.070*** (0.009)	0.070*** (0.009)
Panel B: Import Penetration Ratio				
Import penetration ratio (European)	0.534*** (0.111)	0.165 (0.111)	-0.043*** (0.014)	-0.046** (0.018)
Import penetration ratio (Chinese)	-0.599* (0.321)	0.055 (0.293)	0.007 (0.054)	0.013 (0.056)
Constant	0.580*** (0.074)	0.577*** (0.070)	0.073*** (0.012)	0.073*** (0.012)
Industry f.e.	X	X	X	X
1 (Year after 2014)		X		X
Number of obs	30	30	30	30

# Results: Female to Male Ratio by Education

Female to Male Ratio						
	HEduc		SpecEduc		No Educ	
Panel A: Import Share						
Import share (European)	0.235** (0.091)	0.157 (0.112)	0.189*** (0.034)	-0.000 (0.046)	0.147*** (0.032)	0.021 (0.041)
Constant	0.623*** (0.054)	0.683*** (0.070)	0.783*** (0.059)	0.636*** (0.034)	0.492*** (0.024)	0.587*** (0.032)
Panel B: Import Penetration Ratio						
Import penetration ratio (European)	0.581*** (0.203)	0.412 (0.250)	0.504*** (0.101)	0.065 (0.103)	0.408*** (0.084)	0.136 (0.092)
Constant	0.533*** (0.080)	0.612*** (0.102)	0.405*** (0.040)	0.608*** (0.045)	0.418*** (0.036)	0.543*** (0.042)
Industry f.e.	X	X	X	X	X	X
1 (Year after 2014)		X		X		X
Number of obs	30	30	30	30	30	30

# Results: Gender Employment Share Gap by Education

Gender Employment Share Gap						
	HEduc		SpecEduc		No Educ	
Panel A: Import Share						
Import share	0.037 (0.025)	-0.116** (0.048)	-0.040 (0.030)	0.101* (0.057)	0.002 (0.013)	0.015 (0.018)
Constant	-0.071*** (0.015)	0.046 (0.033)	0.049** (0.017)	-0.058 (0.035)	0.021** (0.008)	0.012 (0.012)
Panel B: Import Penetration Ratio						
Import penetration ratio	0.131 (0.079)	-0.233** (0.108)	-0.107 (0.085)	0.247* (0.123)	-0.025 (0.032)	-0.014 (0.041)
Constant	-0.100*** (0.031)	0.068*** (0.047)	0.068* (0.033)	-0.096* (0.053)	0.032** (0.013)	0.028 (0.017)
Industry f.e.	X	X	X	X	X	X
1 (Year after 2014)		X		X		X
Number of obs	30	30	30	30	30	30

# Regional Employment

	Female share		Male share		Gap	
Panel A: Import Share						
Import share (European)	0.776*** (0.046)	0.384*** (0.092)	0.677*** (0.035)	0.209** (0.090)	-0.099*** (0.035)	-0.174** (0.075)
Constant	0.469*** (0.007)	0.553*** (0.019)	0.597*** (0.005)	0.697*** (0.019)	0.128*** (0.005)	0.144*** (0.014)
Panel B: Import Penetration Ratio						
Import penetration ratio (European)	1.723*** (0.125)	1.045*** (0.218)	1.455*** (0.078)	0.629*** (0.176)	-0.269*** (0.094)	-0.416** (0.168)
Constant	0.395*** (0.014)	0.492*** (0.029)	0.538*** (0.009)	0.656*** (0.024)	0.143*** (0.011)	0.164*** (0.021)
Region f.e.	X	X	X	X	X	X
1 (Year after 2014)		X		X		X
Number of obs	720	720	720	720	720	720

# Conclusion

- Increase of about 4 p.p. in gender pay gap as a result of 10 p.p. reduction in import competition
- Particularly pronounced effect in the western part of Russia
- No effect of imports from China
- Significant negative effect on female relative employment driven primarily by high-skilled women leaving industries