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

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Abstract

In 2014, Russia imposed an import embargo on selected goods, effectively reducing trade flows and decreasing import competition across several industries. In this paper, I analyze the effect of this decrease in product market competition on the gender pay gap in Russia. This research complements the body of evidence which implies that increases in product market competition lead to lower gender pay gaps. The empirical analysis relates 2011-2019 industry-specific gender wage gaps estimated from the Russian Longitudinal Monitoring Survey to the industry-level evolution of import penetration. The results show that a 10 percentage point reduction in import competition leads to an increase of about 4 percentage point in gender pay gap. This increase is smaller in magnitude than the effect found in the US but larger than that observed in some Eastern European countries. This phenomenon partly corresponds to an exacerbation of the gender employment gap driven primarily by high-skilled women leaving industries where import shares, and consequently competition, declined.

Keywords. Gender Pay Gap. Product Market Competition. Russia. Sanctions.

JEL Classification. J71, F14, F51

Introduction

Women earn less than men across the globe. While some of this disparity is due to differences in human capital and occupational segregation (Blau and Kahn, 2006, 2017; Gayle and Golan, 2012; Goldin, 2014; Card et al., 2016), a significant portion of the literature examines the impact of product market forces on the gender pay gap. In particular, a growing body of research explores the effects of globalization

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and trade liberalization, which increase the competition faced by domestic producers. This increased competition has been shown to decrease gender wage gaps (Black and Strahan, 2001; Hellerstein et al., 2002; Black and Brainerd, 2004) and positively affect relative female wages (Benguria and Ederington, 2017; Brussevich, 2018).

In this paper, I provide the first evidence on the gender pay gap consequences of a significant decline in the exposure of domestic producers to international trade, i.e., the effects of declining product market competition. Specifically, I examine the effects of the 2014 Russian embargo on imports from the EU and the US, enacted in response to Western sanctions following the annexation of Crimea and the escalation of the war in Donbas. This embargo provides a unique natural experiment to study the impact of decreased competition on gender wage disparities.

The main empirical strategy I employ consists of two steps. First, I estimate the conditional pay gap between male and female workers in each industry for each year from 2011 to 2019, using the Russian Longitudinal Monitoring Survey (RLMS). In the second step, using Eurostat data, I estimate the impact of decreased competition on the gender pay gap by employing an industry-fixed effects model that relates the gender pay gap to the import penetration ratio or the import share from the EU at the industry level. To rule out the possibility of a substitution effect from China, I additionally control for import measures based on Chinese imports (which were not affected by sanctions). However, the limited number of industries represented in the RLMS and the challenges in matching trade data with RLMS data result in a low number of degrees of freedom at this stage.

I separately analyze the effect of these trade flows on the gender employment gap. Given the limited number of observations in the RLMS data on unemployed individuals, I use aggregated Rosstat data to estimate employment effects. I employ various indicators: industry-specific female-to-male employment ratio, gender gap in industry-specific employment rates, and regional gender-specific employment shares, where different regions are differentially exposed to declining competition due to their pre-existing industrial structure.

I find that the decline in EU imports had a significant negative effect on gender disparities. Specifically, the gender pay gap increased by approximately 4 percentage points in response to a 10 percentage point decrease in import competition. This effect is smaller in magnitude than Black and Strahan (2001) find for the US, where a 10 percentage point increase in import shares leads to a 6.5 percentage point decrease in the gender pay gap. However, the effect I find is larger than Lovász (2008) reports for Hungary, which corresponds to an approximately 1 percentage point decrease in the gender pay gap in response to a 10 percentage point increase in import competition. Changes in Chinese imports did not have any significant effect. Moreover, I find a statistically significant effect on female relative employ-

ment. Specifically, the female-to-male employment ratios inside industries decrease with a decrease in imports. The effect is primarily driven by higher-educated females exiting industries most affected by declining EU import penetration. Due to data limitations, particularly regarding the insufficient number of higher-educated females by industry, it is not possible to evaluate whether these females transition to other industries unaffected by trade or become unemployed. Alternative measures, including regional employment shares, also indicate a worsening of the relative position of females.

This paper contributes to the extensive discussion on gender labor market discrimination. Becker's model of taste-based discrimination posits that increased competition reduces the gender pay gap by driving discriminatory firms out of the market (Becker, 1957). With an increase in product market competition, the additional costs that discriminatory employers incur in paying wage premiums to male workers make them less competitive and eventually force them out of the market. This leads to a decrease in the gender pay gap and an increase in relative female employment. Thus, a higher level of competition in the product market is expected to result in lower gender pay and gender employment gaps. This hypothesis has been extensively tested in empirical studies examining the transition from central planning to market economics, which find that increased product market competition linked to rising trade reduces the gender pay gap: for evidence on several Central European countries, see Brainerd (2000); Newell and Reilly (2001); Lovász (2008). Heyman et al. (2013) further argue that this theory implies a reduction in inefficient management practices in general and discriminatory practices in particular. Juhn et al. (2013) suggest that competition also fosters the adoption of new technologies that cause a decline in demand for physical (primarily male) labor.

Other evidence suggests that female relative employment (rates) can also be improved by trade liberalization. For example, Aguayo-Tellez et al. (2014), Juhn et al. (2013), and Juhn et al. (2014) demonstrate that Mexico's trade integration under NAFTA increased the female employment share, particularly in blue-collar occupations. Ederington et al. (2010) observe a similar effect in Colombia during the 1980s, concluding that increased competition reduces gender-based labor market discrimination.

However, the mechanisms discussed in the literature do not necessarily suggest that once new technologies or more efficient management practices have been adopted, the gender gap will increase with a subsequent decrease in competition. Firms could stop applying discriminatory practices and never return to them due to higher profitability. Also, perceptions and social norms may improve during a period of high competition, and firms won't restart discrimination even if competition drops. One such example is the fair-wage hypothesis by Akerlof and Yellen (1990), according to which workers withdraw their effort if their actual wage is lower than their fair wage. If getting higher wages during a period of higher competition changes the perception of workers regarding a fair wage, then an increase

in the gender pay gap after a drop in competition would violate the emerged norm and be considered unfair. Fehr and Falk (1999) and Kaur (2019) present experimental evidence of Akerlof's hypothesis in different setups and show that an unfair reduction leads to lower workers' efforts and a higher probability of them quitting. Therefore, returning to a state considered unfair by the workers would reduce firms' productivity. Another possibility is that the narrowing of the gender gap associated with trade liberalization could be caused by other forces coinciding with that period. In contrast, Becker's theory predicts that a decline in competition would cause an increase in the gender wage gap, since firms can again afford to incur the costs of discrimination due to higher profits derived from increased product market power if employers with discriminatory tastes were not entirely driven out of the market. To the best of my knowledge, no study considers a drop in product market competition and its effect on the gender pay gap. Instead of focusing on trade liberalization, like most studies on the gender pay gap, I examine the impact of trade withdrawal on the gender pay and employment gaps, thereby testing Becker's theory from a different perspective.

Another contribution of my paper relates to the literature on Russian sanctions. In 2014, a coalition of Western countries, including the USA and the EU, introduced a set of restrictions on a specific group of individuals in response to the annexation of Crimea. Following the escalation of the war in Donbas in mid-2014, the sanctions were expanded to affect trade in equipment for the oil and gas industry and all military technologies. Bělín and Hanousek (2021) find no statistically significant effect of these measures on trade inflows. Russia, however, responded to the Western sanctions by introducing its own embargo restricting imports of food and agricultural products. As a result, Russian firms affected by the embargo lost approximately one-quarter of operating revenue, over one-half of asset value, and about one-third of employees compared to unaffected firms (Ahn and Ludema, 2020). Crozet and Hinz (2020) find that the increased risk in trade with Russia and the weakening of the Russian ruble led to a decrease in trade flows of non-sanctioned goods as well. Notably, Russian firms did not substitute sanctioned imports with imports from other countries (Miromanova, 2019), which implies a total drop in import variations across industries. This withdrawal created a unique setup for studying the effect of a decline in trade exposure and, therefore, product market competition, on the labor market overall and the gender pay gap in particular, which is a further task and contribution of this paper.

Finally, this paper connects to the literature on the Russian labor market. As part of its Soviet inheritance, Russia has high employment rates for both males and females (Gerber and Gimpelson, 2024). At the same time, Russian women traditionally spend more time as caregivers and housekeepers compared to Russian men, while men are considered the main providers and breadwinners (Gerber and Gimpelson, 2024). These traditional gender norms, which are still widespread in Russian society, to-

gether with legislation prohibiting females from working in a set of professions, force women to look for jobs with flexible hours, contributing significantly to occupational and industrial segregation. This segregation, according to Oshchepkov (2021), constitutes the largest part of the existing gender pay gap. Moreover, the gender pay gap tends to be persistent over time: despite substantial changes in institutional and economic structures, the gender wage gap fluctuates close to 30% (Atencio and Posadas, 2015). Due to existing data limitations, specifically the lack of industry-level wage and employment data before the early 2000s, there is no research examining the effect of opening up to competition using industry-level Russian data. It's also worth noting that workers' protection is enforced unevenly, unemployment benefits are low, and labor unions are weak, contributing to greater income and labor market inequality (Gerber and Gimpelson, 2024). Thus, this paper adds to the literature by examining the effect of trade on the labor market, evaluating it on a new level of granularity, namely, the industry level.

Thus, my analysis presents the first evidence in support of Becker's model in a setting characterized by an overall drop in competition. In particular, while Becker's argument that higher competition leads to a decrease in the gender pay gap has been widely tested, I show that a decrease in competition can exacerbate the gender pay gap, at least in the context of a labor market characterized by traditional gender norms and high gender inequality. The study has a major disadvantage in terms of degrees of freedom, but the estimates obtained from different dimensions of the data (the gender pay gap and the gender employment gap estimates, by industry and by region) all point in the same direction, which lends support to the conclusions.

Methodology

Gender pay gap

The main empirical strategy of the estimation consists of two steps. The first step estimates the existing adjusted gender pay gap within each industry, based on the Russian Longitudinal Monitoring Survey (RLMS) dataset. This reflects the part of the gap between female and male workers that is unexplained by the difference in observable productive characteristics. The main equation in this stage is:

$$lnw_{ijt} = \alpha_1 + \gamma_{jt} Male_i + \beta_1 X_{ijt} + \epsilon_{ijt},$$

where $\ln w_{ijt}$ represents the logarithm of the wage of individual i working in industry j in year t, X_{ijt} contains observable characteristics, namely education, experience, and experience squared, and dum-

mies for occupation; Male_i is the dummy variable, which equals 1 if the gender is male and 0 otherwise. The coefficient before the male dummy is of primary interest in this specification as it estimates the existing gap, thus yielding a vector $\hat{\gamma}_{jt}$ as the dependent variable in the second step.

In the second stage, I estimate the following fixed effects model[1]:

$$\hat{\gamma}_{jt} = \alpha_{2_j} + \eta \, Competition_{jt} + \beta_2 \, \mathbb{1}[\text{Year} \geq 2014]_t + u_{jt},$$

where Competition_{jt} is a measure of competition (the import penetration ratio or the import share defined in the Data section) in industry j in year t, and η is the coefficient of interest in this paper. According to Becker's theory, the coefficient η should be negative and statistically significant. The perfect model for this setup would include both industry and time fixed effects. However, due to data limitations and low degrees of freedom, I address the possible time variation by using a dummy denoting years after 2014 (after sanctions introduction). Thus, $\mathbb{1}[\text{Year} \geq 2014]_t$ reflects a dummy for years after 2014.

To account for the precision of the estimates from the first step and possible insignificance of some coefficients I weigh the second stage regression by inverse of standard errors of the pay gap coefficients from the first step (Donald and Lang (2007)). Therefore, I assign greater weight to observations with more precise estimates of the gender pay gap in an attempt to increase the efficiency of the estimate by mitigating the influence of potential noise in the estimation process.

I also estimate the effect of a decrease in imports on the 'Always-Working' sample. For this sample, I consider only individuals that remain in the sample for two consecutive years (e.g. both in 2011 and 2012). I calculate the gender pay gap for each of these years and then consider the next pair of consecutive years (e.g. 2012 and 2013). Finally, I take the difference of the gap for the same year estimated on the different sample (e.g. estimated on the samples working in 2011-2012 and working in 2012-2013, and I take the difference in gender gap for 2012). This new measure I use as a dependent variable similar to the First Differences approach and run it on the differences in imports. The results are presented in Appendix Table 13. This process allows me to discover if the effect of competition on the gender pay gap is driven by changes in the employment or wage structure of people who are always employed.

Given the size of Russia, European imports might only be important to its western areas, closer to the border with the EU (to the west of the Urals), and not for its eastern areas (to the east of the Urals). Therefore, I divide my sample of individuals into two based on their region and estimate the model separately for each part of Russia.

[1]The results for First Differences estimation as a robustness check exercise are also presented in Appendix Table 13.

Moreover, given the possibility that Russia might have attempted to compensate for the drop in European imports with increased imports from China I add measures of competition (the import penetration ratio and the import share) from China and estimate the following fixed-effects model:

$$\hat{\gamma}_{j,t} = \alpha_{2_j} + \eta_1 \, Competition_{j,t}^{EU} + \eta_2 \, Competition_{j,t}^{China} + \beta_2 \, \mathbb{1}[\text{Year} \geq 2014]_t + u_{j,t}.$$

I run the augmented regression model for both the full sample and the samples divided by East and West.

Gender employment gap

To assess the employment effect I use two different measures, each taking different quantities as given. Firstly, I consider the female-to-male ratio within each industry:

$$\text{Female to Male Ratio}_{jt} = \frac{\text{\# of Female Workers in Industry } j \text{ in Year } t}{\text{\# of Male Workers in Industry } j \text{ in Year } t}. \tag{1}$$

This way, I measure the effect on female employment relative to male employment taking the evolution of total industry-specific employment as given.

Another approach involves taking the evolution of the aggregate number of workers by gender as given. For this, I consider the distribution of employment shares by industry within each gender and calculate the gap:

$$\text{Gender Employment Gap}_{jt} = x_{jt} - y_{jt}, \tag{2}$$

where 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.

This measure captures the changing distribution of employed men and women across industries.

Employment Effect by education

Since different groups of workers might be affected differently, I also examine the effect on employment by education. I use two measures. First, I examine whether the Female-to-Male ratio within an industry and educational group is affected by changes in import competition (which, again, implies the assumption of taking the industry evolution of employment by education as given). For each industry

j, educational group k, and year t, I calculate the Female-to-Male ratio as follows:

$$\text{Female to Male Ratio}_{kjt} = \frac{\text{\# of Female Workers in Industry } j \text{ with Educational level } k \text{ in Year } t}{\text{\# of Male Workers in Industry } j \text{ with Educational level } k \text{ in Year } t} \tag{3}$$

and regress this measure on import competition variables.

Finally, I revisit the gap in employment shares, taking the evolution of the aggregate number of workers as given. I examine the distribution of employment shares by education within each gender and industry and calculate the difference:

$$\text{Gender Employment Gap}_{kjt} = x_{kjt} - y_{kjt}, \tag{4}$$

where x_{kjt} - Share of Men with Educational level k in industry j among all Men in Year t

y_{kjt} - Share of Women with Educational level k in industry j among all Women in Year t.

I then regress this gap measure on import competition variables.

Regional Employment effect

Due to data limitations corresponding to the number of industries in the RLMS, all estimation is based on small samples. To check the consistency of my results on a larger sample, I focus on regional variation. In this case, my left-hand side variable is gender gap in employment rates by region. Since my import variables are at the industry level and not available at a more granular regional-industry level, I employ a transformation similar to Acemoglu et al. (2016). This involves weighting imports by employment in each industry for each region to create measures of import share and import penetration ratio exposure intensity by region. Thus, I create the following measure:

$$Import_{rt} = \sum_{j=1}^{N} \frac{L_{jrt}}{L_{rt}} Import_{jt}, \tag{5}$$

where Import_{rt} is a measure of import decline intensity in region r in year t, L_{jrt} represents employment in industry j in region r in year t, L_{rt} denotes overall employment in region r in year t, and Import_{jt} is the import variable in industry j and year t used in the analysis. Then, using this as an independent variable, I regress the gender gap in employment rates by region on this new measure, adding fixed effects for regions and a dummy that tracks if the time period in question is from before or after 2014. Additionally, I utilize clustered standard errors by region to account for possible serial correlation in errors. Due to data limitations of RLMS related to the number of observations on industry-region level and corresponding lack of representativeness of RLMS on the regional level, I estimate this regression

only for the gap in employment, for which I use official Labor statistics (discussed in the Data section) of employment rates by gender and region.

Data

Competition

To measure changing import competition, I utilize two key indicators: the import penetration ratio and the import share. The import share is calculated by dividing the total value of imports for an industry by the industry's value added, providing information on how much each industry relies on imports relative to its economic output. However, this information is not comprehensive as it does not account for exports and may underestimate competitive pressure in larger industries with higher value added. The import penetration ratio is defined as the share of imports in domestic demand, calculated as (GDP - Exports + Imports). This measure shows the extent to which domestic demand is satisfied by imports. Unlike the import share, the import penetration ratio captures the full market context by considering both the supply side (domestic production) and the demand side (imports and exports), making it more reliable for my analysis.

I rely on import and export data from Eurostat, which provides trade data by industries at the SITC 6-digit level. However, due to the lack of granularity in my wage data source, I must use aggregated data (1-digit level), potentially leading to issues with estimation due to limited variation, especially since the Russian embargo was introduced at the 4-digit level.

To calculate the GDP of each industry, I utilize the distribution of Value Added by Russian industries from Rosstat. Since Russian data are presented in Billions of Rubles and Eurostat data are in Euros, I convert all figures to US dollars using annual exchange rates from the OECD.

Figure 1 illustrates the import share and import penetration ratio by industry from 2004 to 2019. The first significant insight is that there wasn't any declining trend in imports before 2014 except for the oil and gas industry, which was decreasing after the crisis in 2008. The data suggests a decline in import share in four out of six industries after the introduction of sanctions in 2014, with the biggest decrease in Manufacturing[2] by about 20 percentage points. The import penetration ratio, however, shows a slight increase in one industry (Building) around 2014-2016, followed by a downward trend after 2016. For other industries, the tendencies are similar to those for import shares.

For Chinese import data, I rely on the World Integrated Trade Solution (WITS). This data lacks the granularity of the European dataset and it employs different classifications for the same variables. While I

[2]By Manufacturing here and further in the paper I mean Civil Manufacturing, i.e. Non-Military Manufacturing.

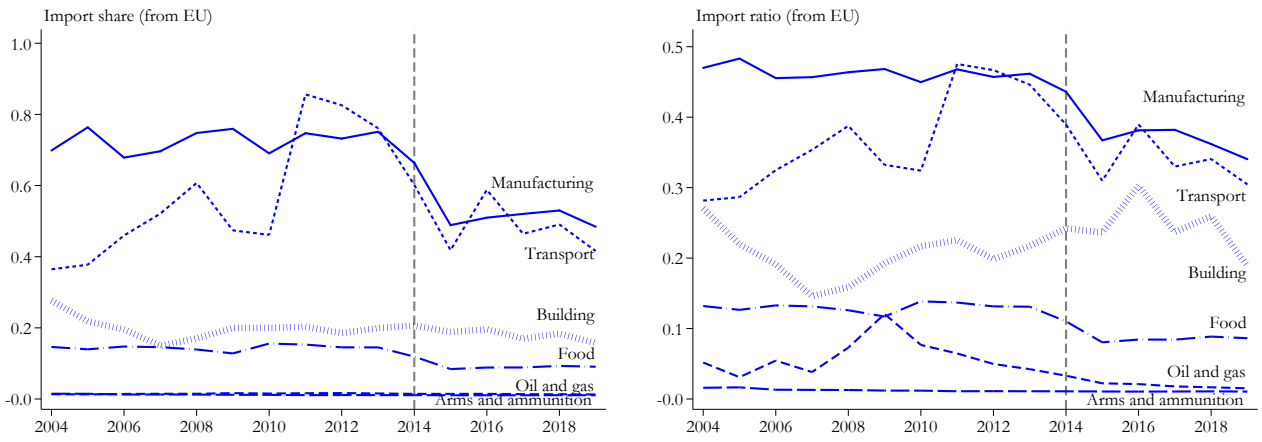

Figure 1: EU Import Share and EU Import Penetration Ratio by industries in 2011-2019 (Source: Eurostat, Rosstat (2011-2019)

primarily use the SITC classification as for European data, I make exceptions for certain industries (e.g., Transport) where the HS classification offers greater granularity. This data is already presented in US dollars; therefore, I have to convert to dollars only Value Added from the Russian data (the same as for European import shares).

Figure 2 displays the import share and import penetration ratio from China by industry from 2011 to 2019. The data indicates that only one industry (Manufacturing) was significantly and negatively affected after 2014. The remaining industries exhibit minor fluctuations, with no clear trend emerging post-sanctions. Notably, none of the industries experienced a positive trend after 2014, suggesting that Russia did not increase imports from China to offset the decline in European imports. The correlation between differences in imports from Europe and China is positive and significant: 0.61 for import share and 0.55 for import penetration ratio.

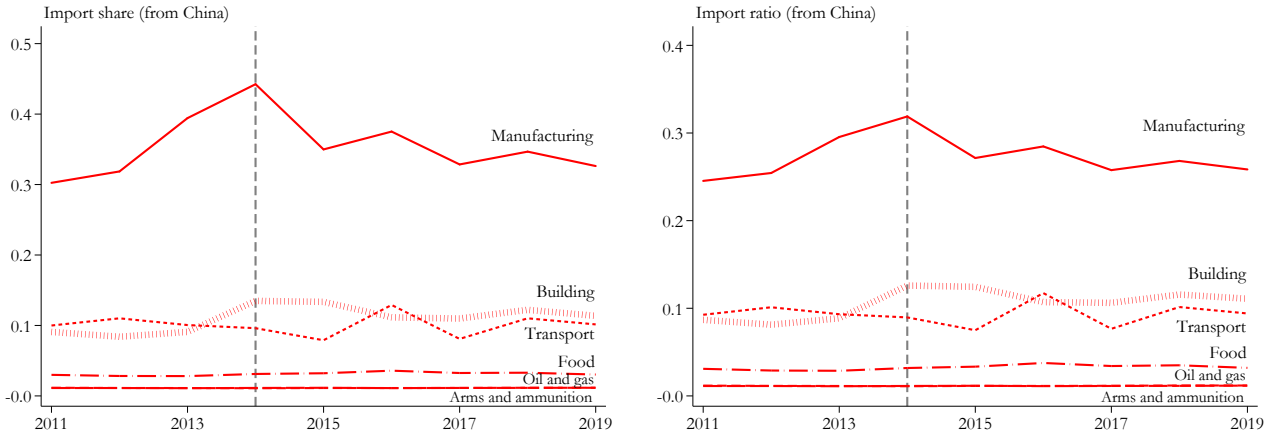

Figure 2: China Import Share and China Import Penetration Ratio by industries in 2011-2019 (Source: WITS, Rosstat (2011-2019))

Table 1: Summary statistics of individual data

	Number of observations	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

Note: The table includes only employed, full-time workers with earnings more than 1000 RUB working in the industries considered (Food industry, Manufacturing, Transport, Building, Oil and Gas, and Arms and Ammunition). The self-employed and individuals with working hours less than 35 are eliminated from the sample. The sample is trimmed on the 99.75 and 0.25 percentiles. Only individuals observed during at least 3 years are included. Source: RLMS (2011-2019).

Wage data

The primary source of data on individual labor incomes is the Russian Longitudinal Monitoring Survey — Higher School of Economics (RLMS-HSE), a series of annual household surveys designed to monitor the economic welfare of households and individuals in Russia. The RLMS collects information regarding earnings, employment, and the industry of individuals' workplaces for the previous thirty days, along with basic characteristics of workers since 1994. This paper uses RLMS data for the period 2011-2019, covering four years before the imposition of sanctions and five years after. This timeframe enables the consideration of trends preceding the sanctions. The sample comprises working-age individuals in Russia, where the definition of working age differs for men and women. Thus, all individuals considered are at most 55 years old, employed full-time (working at least 30 hours) in the month before the interview, and observed in the sample for at least three years. Summary statistics of individual data are presented in Table 1. According to this table, I have a relatively stable number of observations for Russia, with the female share being around 30-32%. The average gap between Male and Female earnings in Russia remains stable around 30%, which is consistent with the estimation by Oshchepkov (2021).

Employment data

To study the effect on employment, I need data on gender employment shares in each industry. However, the Russian Longitudinal Monitoring Survey (RLMS) lacks sufficient data on unemployed individuals by industry. Therefore, to overcome this limitation, I utilize official data from the Labor office

Table 2: Summary statistics of employment data

	Female Share	Mean FtM	FtM Higher Educ	FtM Vocational Educ	FtM No Educ
2012	0.278	0.406	0.593	0.364	0.350
2013	0.277	0.407	0.587	0.361	0.354
2015	0.269	0.389	0.571	0.337	0.335
2017	0.251	0.352	0.534	0.295	0.310
2019	0.248	0.349	0.543	0.291	0.295

The female share is calculated as the proportion of females employed in an industry in a particular year to the overall number of workers employed in that industry in the same year. FtM stands for Female to Male Employment Ratio, which is calculated as the proportion of females to males in an industry in a particular year. The Female to Male Ratio by education group is calculated similarly, but only includes individuals with the specified level of education. Source: Rosstat.

of Rosstat[3]. This data, which includes employment by gender and industry, is published biannually, further reducing the number of available observations and potentially impacting the quality of results.

Table 2 summarizes relative female employment. Both the average share of females in the workforce and the female-to-male employment ratio demonstrate a decline over time. This trend may suggest a positive association between the reduction in import competition and a decline in employment. Additionally, the female-to-male ratio within each educational group declines by approximately 6%, indicating a potential positive relationship between import variables and employment.

A similar trend is identified on employment data by regions in Table 3. In this data, employment shares by industry are not available. However, there are gender employment rates for each region out of all 80 regions in Russia in all years of consideration. This method allows me to overcome the limitation with the small number of degrees of freedom despite losing the industry dimension. Both average male and female employment rates across regions in Russia fell, starting from 2014. The average female employment rate decreased by 4 percentage points from 2013 to 2014 and then continued falling until 2019. At the same time, the average male employment share fell by 5 percentage points from 2014 to 2015, but then had a slight increase in 2016, which also coincided with an increase in the import share that was shown in Figure 1. The standard deviation of male and female employment rates increased, indicating a rise in employment variance across Russian regions. This could suggest an association between the intensity of the effect from trade withdrawal on local competition and regional employment.

[3]Source: https://rosstat.gov.ru/folder/210/document/13210.

Table 3: Summary statistics of Employment Data by Regions

	Female Employment Rate				Male Employment Rate			
	Mean	St Dev	Min	Max	Mean	St Dev	Min	Max
2011	0.627	0.04	0.526	0.791	0.736	0.03	0.626	0.841
2012	0.630	0.04	0.519	0.806	0.740	0.04	0.573	0.843
2013	0.630	0.04	0.542	0.809	0.740	0.04	0.591	0.853
2014	0.592	0.05	0.421	0.793	0.694	0.05	0.464	0.829
2015	0.592	0.05	0.416	0.756	0.694	0.05	0.486	0.812
2016	0.592	0.05	0.428	0.767	0.697	0.05	0.504	0.823
2017	0.590	0.05	0.455	0.751	0.695	0.05	0.49	0.813
2018	0.524	0.05	0.424	0.72	0.661	0.04	0.50	0.79
2019	0.518	0.05	0.416	0.741	0.655	0.05	0.46	0.81

According to the definition provided by Rosstat, the employment rate is calculated as the number of all employed people, divided by the total population. The table provides employment rates by gender and summarizes the data for all 80 regions of Russia. Data: Rosstat. Regional statistics (2011-2019).

Results

Import competition from Europe

The baseline findings on the gender pay gap effects of a decrease in the product market competition are showed in Table 4. The analysis reveals a negative impact of the decline in European imports on the gender pay gap in Russia[4]. Specifically, a decrease in European import share of 0.01 (or 1 percentage point) corresponds to an approximate 0.4 percentage points increase in the gender pay gap. Similarly, a reduction in the European import penetration ratio by 1 percentage point results in an approximately 1.1 percentage point rise in the gender pay gap. Although the results exhibit slight variation across specifications with and without a dummy variable for the post-2014 period, they consistently indicate a significant negative association between European import decline and the gender pay gap[5]. To quantify these results, an average decrease in the import share was around 10 percentage points, which translates to an increase in the gender pay gap by 4 percentage points, i.e. from on average 26% to 30%.

Based on the estimation on the 'Always-Working' Sample in Appendix Table 13, which takes into account only people working for at least two consecutive years of the estimation, the effect of import competition is significant only in specifications with the import penetration ratio and only at the 10% level of significance. This might imply that the effect found in Table 4 is driven mostly by changes in

[4]Results are qualitatively the same when there is no control for occupations in the first stage.

[5]Adding fixed effects for years does not change results for the whole country either qualitatively or quantitatively. The results of estimation with year fixed effects are presented in Appendix Table 12.

relative female employment but not the changes in wage structure per se.

Regarding the Eastern and Western parts of Russia, the analysis confirms the anticipated outcome: the decrease in European imports does not exert a significant effect on the Eastern part of the country. However, it significantly impacts the Western region, with the quantitative effect slightly stronger than the national average.

Table 4: Impact of European Competition on the Gender Pay Gap, Dependent Variable: Gender Pay Gap by Industry and Year

	Panel A: Import Share					
	Whole Country		East		West	
Import share	-0.235^{**}	-0.379^{**}	-0.095	-0.300	-0.255^{*}	-0.462^{**}
	(0.103)	(0.159)	(0.218)	(0.300)	(0.129)	(0.194)
Constant	0.453^{***}	0.567^{***}	0.343^{***}	0.502^{**}	0.489^{***}	0.652^{***}
	(0.063)	(0.106)	(0.124)	(0.197)	(0.071)	(0.129)
	Panel B: Import Penetration Ratio					
Import penetration ratio	-0.740^{***}	-1.109^{***}	-0.591	-1.177	-0.810^{**}	-1.317^{**}
	(0.273)	(0.372)	(0.546)	(0.785)	(0.468)	(0.436)
Constant	0.607^{***}	0.786^{***}	0.521^{**}	0.803^{**}	0.657^{***}	0.905^{***}
	(0.109)	(0.155)	(0.211)	(0.336)	(0.018)	(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

Note: * - significant at 10%; ** - significant at 5%; *** - significant at 1%. Robust standard errors are in parentheses.
In all specifications, the dependent variable is the gender pay gap from a Mincerian regression. All specifications are weighted by the inverse of the standard error of the gender pay gap coefficient to account for possible insignificant coefficients. The results of the estimation including year fixed effects are presented in the Appendix in Table 12.

Import competition from China

Given China's significance as a trade partner of Russia, it was important to investigate whether fluctuations in Chinese imports influenced the gender pay gap, particularly in response to changes in European imports.

The estimation results, as shown in Table 5, indicate that Chinese imports did not exert a significant influence on the gender pay gap in Russia[6]. Despite the possibility of Russia compensating for

[6]In Appendix Table 15, I present the estimation results of only imports from China on the gender pay gap. The coefficients

decreased European imports with increased imports from China, the analysis suggests that Chinese imports did not play a significant role in driving changes in the gender pay gap.

Moreover, the effect of European imports on the gender pay gap remained consistent across specifications, even after controlling for Chinese imports. This consistency underscores the substantial impact of changes in European imports on the gender pay gap, which is further supported by Russia's higher import share and import penetration ratio from Europe across all industries.

Table 5: Impact of Chinese and European Competition on Gender Pay Gap, Dependent Variable: Gender Pay Gap by Industry and Year

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

Note: * - significant at 10%; ** - significant at 5%; *** - significant at 1%. Robust standard errors are in parentheses. In all specifications, the dependent variable is the gender pay gap from a Mincerian regression. All specifications are weighted by the inverse of the standard error of the gender pay gap coefficient to account for possible insignificant coefficients. The results of the estimation including year fixed effects are presented in Appendix in Table 12.

of this estimation are also statistically insignificant.

Employment effect

To investigate the effect on relative female empoyment, I initially focus on the female-to-male ratio within industries defined as in Equation (1). Specifically, this ratio is defined as the number of females working in a given industry in a given year to the number of males working in that industry in the same year. This way, I take the evolution of total industry-specific employment as given. Regression models are estimated both with and without the inclusion of Chinese import variables to assess their potential influence on gender employment structure dynamics.

In the model incorporating year fixed effects, as shown in Table 6, Chinese imports have no significant effect on the female-to-male ratio. However, the results reveal that a decrease in European import share by 0.1 (or 10 percentage points) is associated with a corresponding decrease of approximately 0.5 percentage points in the female-to-male ratio. This finding suggests that the decline in competition not only negatively impacts females' pay but also influences female relative to male employment.

Subsequently, I employ an alternative method to measure the employment effect, which involves assessing the gender gap in employment shares by industries (Equation (2)). Namely, the new measure represents the difference between the share of the men employed in industry j in year t to all men employed in year t and the share of the women employed in industry j in year t to all women employed in year t[7]. As depicted in Table 7, the results are consistent with those obtained through the first method. The analysis reveals that a decrease in competition exacerbates the gender gap in employment, with the gap increasing by 0.2 percentage points in response to a 10 percentage points decrease in import share. Notably, the effect of the import penetration ratio is even more pronounced, as the same decrease results in a 0.5 percentage points increase in the gender gap in employment.

[7]Given the definition of the measure, the effect of the same direction as the Female-to-Male ratio will correspond to the coefficients with the opposite signs. This happens because given a constant number of men, the Female-to-Male ratio goes down, with a decrease in the number of women, while the difference in employment shares by gender increases.

Table 6: Impact of Competition on Female Employment, Dependent Variable: Female to Male Employment Ratio by Industry and Year

	Panel A: Import Share			
Import share (European)	0.179***	0.047	0.190***	0.034
	(0.039)	(0.048)	(0.041)	(0.053)
Import share (Chinese)			−0.194	0.137
			(0.152)	(0.190)
Constant	0.530***	0.630***	0.588***	0.593***
	(0.025)	(0.034)	(0.052)	(0.060)
	Panel B: Import Penetration Ratio			
Import penetration ratio (European)	0.471***	0.176*	0.534***	0.165
	(0.101)	(0.098)	(0.111)	(0.111)
Import penetration ratio (Chinese)			−0.599*	0.055
			(0.321)	(0.293)
Constant	0.450***	0.587***	0.580***	0.577***
	(0.041)	(0.042)	(0.074)	(0.070)
Industry f.e.	X	X	X	X
1 (Year after 2014)		X		X
Number of obs	30	30	30	30

Note: * - significant at 10%; ** - significant at 5%; *** - significant at 1%. Robust standard errors are in parentheses.

The dependent variable Female to Male Ratio is as defined in Equation 1. It is a number of females working in an industry j in year t to a number of males working in the same industry j in year t. The evolution of total industry-specific employment is considered as given.

Table 7: Impact of Import Competition on Relative Female Employment, Dependent Variable: Gender Employment Gap by Industry and Year

	Panel A: Import Share			
Import share (European)	-0.018^{***}	-0.018^{***}	-0.017^{***}	-0.017^{**}
	(0.005)	(0.006)	(0.005)	(0.007)
Import share (Chinese)			-0.007	-0.008
			(0.029)	(0.029)
Constant	0.068^{***}	0.068^{***}	0.070^{***}	0.070^{***}
	(0.003)	(0.005)	(0.009)	(0.009)
	Panel B: Import Penetration Ratio			
Import penetration ratio (European)	-0.042^{***}	-0.044^{***}	-0.043^{***}	-0.046^{**}
	(0.012)	(0.015)	(0.014)	(0.018)
Import penetration ratio (Chinese)			0.007	0.013
			(0.054)	(0.056)
Constant	0.074^{***}	0.075^{***}	0.073^{***}	0.073^{***}
	(0.005)	(0.007)	(0.012)	(0.012)
Industry f.e.	X	X	X	X
1 (Year after 2014)		X		X
Number of obs	30	30	30	30

Note: * - significant at 10%; ** - significant at 5%; *** - significant at 1%. Robust standard errors are in parentheses.

The dependent variable Gender Employment Gap is as defined in Equation 2. Namely, it represents the difference between the share of men employed in industry j in year t to all men employed in year t and the share of women employed in industry j in year t to all women employed in year t.

Employment effect by Education

Given the negative effects observed on female employment and the gender pay gap, it is essential to investigate whether specific educational groups are driving these results. As Hunt (2002) suggests, some educational groups of females might be more affected by changes in product competition than others[8]. The author explains this through possible changes in the labor market demand for skills as well as the managers' perception of fairness. Thus, I investigate whether the female-to-male ratio within each industry and educational group is affected by changes in import competition. As outlined in Table 8, the results from the model with only industry fixed effects reveal a decrease in the female-to-male ratio across all educational groups, with the most substantial effect observed in the higher education group. This finding aligns with the decline in the overall share of higher-educated individuals over time, as seen in Table 2. However, upon adding a dummy for the years after 2014, the significance of the effect diminishes for all groups. The magnitude changes as well; however, for the higher-educated female group, it falls significantly less than for other groups. The effect in this group for both import variables are on the edge of significance, which may be due to the small number of observations and, therefore, limited degrees of freedom.

To verify my findings on the female-to-male ratio, I employ an alternative measure assessing the gender gap in employment shares by industries and educational groups, as defined in Equation 4. The estimation results presented in Table 9 indicate that the gender employment gap for highly educated workers increases by 0.12 and 0.23 percentage points with a decrease of 0.01 in import share and import penetration ratio, respectively. This suggests that the decline in competition negatively affects female employment relative to males, particularly among those with higher education. Consequently, this contributes to the widening gender employment gap, which in turn explains the increase observed in the gender pay gap.

[8]In the Appendix (Table 16), I also perform an exercise on estimation of the effect on overall employment shares within industries by educational group i.e. the dependent variable is the share of educational group in each industry j in year t. The results indicate a decline in the overall share of higher-educated individuals in industries with a decreases in import. Specifically, a decrease in import share by 0.01 corresponds to an 0.08 decrease in the share of higher-educated individuals, while the share of individuals with no education increases by 0.07. I find no significant effect on people with vocational (specialized) education.

Table 8: Impact of Competition on Female Employment by Education, Dependent Variable: Female to Male Ratio by Education group, Industry, and Year

	Panel A: Import Share					
	HEduc		SpecEduc		No Educ	
Import share (European)	0.235**	0.157	0.189***	−0.000	0.147***	0.021
	(0.091)	(0.112)	(0.034)	(0.046)	(0.032)	(0.041)
Constant	0.623***	0.683***	0.783***	0.636***	0.492***	0.587***
	(0.054)	(0.070)	(0.059)	(0.034)	(0.024)	(0.032)
	Panel B: Import Penetration Ratio					
Import penetration ratio (European)	0.581***	0.412	0.504***	0.065	0.408***	0.136
	(0.203)	(0.250)	(0.101)	(0.103)	(0.084)	(0.092)
Constant	0.533***	0.612***	0.405***	0.608***	0.418***	0.543***
	(0.080)	(0.102)	(0.040)	(0.045)	(0.036)	(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

Note: * - significant at 10%; ** - significant at 5%; *** - significant at 1%. Robust standard errors are in parentheses.

The dependent variable is defined as in Equation 3. Namely, it represents the fraction of the number of females in industry j with educational level k in year t to the number of males in industry j with educational level k in year t. The educational groups are defined following Rosstat methodology. Namely, individuals with higher education, individuals with vocational (specialized professional) education (in Russian: nachal'noye and sredneye professional'noye obrazovaniye) and individuals with no education other than school (i.e. individuals who finished their education after grade 9 or 11).

Table 9: Impact of Competition on Employment shares by education based on Official statistics, Dependent Variable: Gender Employment Gap by Education Group, Industry, and Year

	Fixed Effects model					
	HEduc		SpecEduc		No Educ	
	Panel A: Import Share					
Import share	0.037	-0.116^{**}	-0.040	0.101^{*}	0.002	0.015
	(0.025)	(0.048)	(0.030)	(0.057)	(0.013)	(0.018)
Constant	-0.071^{***}	0.046	0.049^{**}	-0.058	0.021^{**}	0.012
	(0.015)	(0.033)	(0.017)	(0.035)	(0.008)	(0.012)
	Panel B: Import Penetration Ratio					
Import penetration ratio	0.131	-0.233^{**}	-0.107	0.247^{*}	-0.025	-0.014
	(0.079)	(0.108)	(0.085)	(0.123)	(0.032)	(0.041)
Constant	-0.100^{***}	0.068^{***}	0.068^{*}	-0.096^{*}	0.032^{**}	0.028
	(0.031)	(0.047)	(0.033)	(0.053)	(0.013)	(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

Note: * - significant at 10%; ** - significant at 5%; *** - significant at 1%. Robust standard errors are in parentheses.

The dependent variable Gender Employment Gap by Education group is as defined in Equation 4. Namely, it represents the difference between the share of the men with educational level k employed in industry j in year t to all men with educational level k employed in year t and the share of the women with educational level k employed in industry j in year t to all women with educational level k employed in year t. The educational groups are defined following Rosstat methodology. Namely, individuals with higher education, individuals with vocational (specialized professional) education (in Russian: nachal'noye and sredneye professional'noye obrazovaniye) and individuals with no education other than school (i.e. individuals who finished their education after grade 9 or 11).

Regional Employment

The last part of my analysis estimates the effect of trade withdrawal on regional employment. Due to data limitations regarding the number of industries in RLMS, all my results discussed are based on small sample estimation. Therefore, estimation on the larger sample of regions (data on all 80 regions of Russia for each year from 2011 to 2019) allows me to confirm the direction of the estimated effects. Since there is no available region-industry level data, I use a transformation similar to Acemoglu et al. (2016), as defined in Equation 5, and calculate the weighted average of the import variable for each region, using regional employment shares in the corresponding industry as weights. This approach allows me to approximate the intensity of import exposure across regions and, therefore, analyze the effect of trade withdrawal on local employment using the corresponding variance.

The results presented in Table 10, based on the regional data, reaffirm my previous findings, indicating that the employment share of both females and males decreases in the industries where there was a decline in imports. However, the effect on females is stronger than on males. This difference translates into significant negative coefficients for the gap in employment shares between males and females. Namely, the gender gap in employment rates increases by 0.2 percentage points and by approximately 0.4 percentage points with the decrease by 1 percentage point in the import share and import penetration ratio respectively.

Concluding the analysis, in line with Becker's theoretical prediction, my results show that the relative labor market position of females worsens with a decrease in competition, both in terms of wages and employment. I find a significant effect of the import drop on the gender pay gap, which increases by around 0.4 percentage points with a 1 percentage point decrease in import share. The same decrease in the import penetration ratio is associated with a 1.1 percentage point increase in the gender pay gap. This effect is primarily concentrated in the Western part of Russia and is not influenced by controlling for imports from China.

Various measures of employment also show a significant effect of imports from Europe, but not from China. Specifically, the female-to-male ratio decreases by about 0.2 percentage points with a 1 percentage point decrease in imports. Meanwhile, the gap in employment rates increases by 0.02 and 0.04 percentage points with a 1 percentage point decrease in import share and import penetration ratio, respectively. These changes are predominantly driven by higher-educated women leaving the industries, with the gap in employment rates widening by around 0.2 percentage points for every 1 percentage point decrease in imports. Analysis at the regional level suggests results of similar magnitude.

Table 10: Impact of Competition on Regional Employment. Dependent variables: Female Employment Rate by Region and Year, Male Employment Rate by Region and Year, and Gap between Female and Male Employment Rates by Region and Year

	Panel A: Import Share					
	Female share		Male share		Gap	
Import share (European)	0.776***	0.384***	0.677***	0.209**	−0.099***	−0.174**
	(0.046)	(0.092)	(0.035)	(0.090)	(0.035)	(0.075)
Constant	0.469***	0.553***	0.597***	0.697***	0.128***	0.144***
	(0.007)	(0.019)	(0.005)	(0.019)	(0.005)	(0.014)
	Panel B: Import Penetration Ratio					
Import penetration ratio (European)	1.723***	1.045***	1.455***	0.629***	−0.269***	−0.416**
	(0.125)	(0.218)	(0.078)	(0.176)	(0.094)	(0.168)
Constant	0.395***	0.492***	0.538***	0.656***	0.143***	0.164***
	(0.014)	(0.029)	(0.009)	(0.024)	(0.011)	(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

Note: * - significant at 10%; ** - significant at 5%; *** - significant at 1%. I use standard errors clustered by regions to deal with possible serial correlation, which are reported in parentheses.
Female share represents the female employment rate by region. Male share represents the male employment rate by region. Gap represents the difference between the male and female employment rates. The data covers the employment rates by gender in all 80 regions of Russia in 2011-2019. Independent variables are import share and import penetration ratio on regional level, which are defined as in Equation 5. Namely it's the weighted average of imports by region where the weights are the shares of regional employment by industry.

Conclusion

In 2014, Russia imposed an import embargo on selected goods in response to sanctions by 37 Western countries. Consequently, Russian trade flows decreased significantly, impacting both sanctioned and non-sanctioned goods Bělín and Hanousek (2021); Crozet and Hinz (2020). Miromanova (2019) find that Russian firms did not manage to substitue sanctioned imports with imports from other countries, implying a total drop in import variations across industries.

Becker's model (1957) posits that higher levels of competition result in a reduced gender wage gap due to a decrease in employers' discriminatory behavior. Empirical evidence largely supports the notion that trade liberalization and increased product market competition narrow the gender wage gap. However, it remains unclear whether the mechanism operates in reverse—whether a decrease in competition widens the gap.

This study contributes to the burgeoning literature on the gender wage gap and Russian sanctions by examining workers following the imposition of embargoes on certain imported goods. Our findings indicate a significant negative effect of trade withdrawal on the gender pay gap, consistent with Becker's discrimination model predicting an increase in the gap with decreased competition. This effect was particularly pronounced in the Western part of Russia, which is geographically closer and thus more exposed to European imports. Moreover, employing various measures for the employment gap, we identify a statistically significant effect on the gap in employment, implying the worsening of the relative position of women and primarily driven by women with higher education exiting trade-related industries. The data does not allow me to estimate if these women exit to unemployment or to other industries that were less affected by the drop in imports.

Thus, this analysis provides the first evidence supporting Becker's model in a setting characterized by an overall decrease in competition. Specifically, while Becker's assertion that higher competition reduces the gender pay gap has been extensively tested, our study demonstrates that a decrease in competition can conversely increase both the gender pay and employment gaps at least in the labor market characterized by traditional gender norms and high gender inequality.

References

ACEMOGLU, D., D. AUTOR, D. DORN, G. H. HANSON, AND B. PRICE (2016): "Import competition and the great US employment sag of the 2000s," *Journal of Labor Economics*, 34, S141–S198.

AGUAYO-TELLEZ, E., J. AIROLA, C. JUHN, AND C. VILLEGAS-SANCHEZ (2014): "Did trade liberalization help women? The case of Mexico in the 1990s," in *New analyses of worker well-being*, Emerald Group Publishing Limited, vol. 38, 1–35.

AHN, D. P. AND R. D. LUDEMA (2020): "The sword and the shield: The economics of targeted sanctions," *European Economic Review*, 130, 103587.

AKERLOF, G. A. AND J. L. YELLEN (1990): "The fair wage-effort hypothesis and unemployment," *The Quarterly Journal of Economics*, 105, 255–283.

ATENCIO, A. AND J. POSADAS (2015): "Gender gap in pay in the Russian Federation: twenty years later, still a concern," *World Bank Policy Research Working Paper*.

BECKER, G. (1957): "The Economics of Discrimination," .

BĚLÍN, M. AND J. HANOUSEK (2021): "Which sanctions matter? Analysis of the EU/Russian sanctions of 2014," *Journal of Comparative Economics*, 49, 244–257.

BENGURIA, F. AND J. EDERINGTON (2017): "Decomposing the effect of trade on the gender wage gap," *Available at SSRN 2907094*.

BLACK, S. E. AND E. BRAINERD (2004): "Importing equality? The impact of globalization on gender discrimination," *ILR Review*, 57, 540–559.

BLACK, S. E. AND P. E. STRAHAN (2001): "The division of spoils: rent-sharing and discrimination in a regulated industry," *American Economic Review*, 91, 814–831.

BLAU, F. D. AND L. M. KAHN (2006): "The US gender pay gap in the 1990s: Slowing convergence," *Ilr Review*, 60, 45–66.

——— (2017): "The gender wage gap: Extent, trends, and explanations," *Journal of economic literature*, 55, 789–865.

BRAINERD, E. (2000): "Women in transition: Changes in gender wage differentials in Eastern Europe and the former Soviet Union," *ILR Review*, 54, 138–162.

BRUSSEVICH, M. (2018): "Does trade liberalization narrow the gender wage gap? The role of sectoral mobility," *European Economic Review*, 109, 305–333.

CARD, D., A. R. CARDOSO, AND P. KLINE (2016): "Bargaining, sorting, and the gender wage gap: Quantifying the impact of firms on the relative pay of women," *The Quarterly journal of economics*, 131, 633–686.

CROZET, M. AND J. HINZ (2020): "Friendly fire: The trade impact of the Russia sanctions and counter-sanctions," *Economic policy*, 35, 97–146.

DONALD, S. G. AND K. LANG (2007): "Inference with difference-in-differences and other panel data," *The review of Economics and Statistics*, 89, 221–233.

EDERINGTON, J., J. MINIER, AND K. R. TROSKE (2010): "Where the Girls Are: Trade and labor market segregation in Colombia," *University of Kentucky, Lexington, KY, USA*.

FEHR, E. AND A. FALK (1999): "Wage rigidity in a competitive incomplete contract market," *Journal of political Economy*, 107, 106–134.

GAYLE, G.-L. AND L. GOLAN (2012): "Estimating a dynamic adverse-selection model: Labour-force experience and the changing gender earnings gap 1968–1997," *The Review of Economic Studies*, 79, 227–267.

GERBER, T. P. AND V. GIMPELSON (2024): "Inequality and social stratification in Russia during the Putin regime: From market transition to war on Ukraine," *Sociology Compass*, 18, e13196.

GOLDIN, C. (2014): "A grand gender convergence: Its last chapter," *American Economic Review*, 104, 1091–1119.

HELLERSTEIN, J., D. NEUMARK, AND K. TROSKE (2002): "Market Forces and Sex Discrimination." *Journal of Human Resources*, 37, 353–380.

HEYMAN, F., H. SVALERYD, AND J. VLACHOS (2013): "Competition, takeovers and gender discrimination," *ILRReview*, 66, 409–432.

HUNT, J. (2002): "The transition in East Germany: When is a ten-point fall in the gender wage gap bad news?" *Journal of Labor Economics*, 20, 148–169.

JUHN, C., G. UJHELYI, AND C. VILLEGAS-SANCHEZ (2013): "Trade liberalization and gender inequality," *American Economic Review*, 103, 269–273.

——— (2014): "Men, women, and machines: How trade impacts gender inequality," *Journal of Development Economics*, 106, 179–193.

KAUR, S. (2019): "Nominal wage rigidity in village labor markets," *American Economic Review*, 109, 3585–3616.

LOVÁSZ, A. (2008): "Competition and the Gender Wage Gap: New Evidence from Linked Employer-Employee Data in Hungary 1986-2003," *Budapest working papers on the labour market*.

MIROMANOVA, A. (2019): "Quantifying the trade reducing effect of embargoes: firm level evidence from russia," *Unpublished manuscript, University of Oregon*.

NEWELL, A. AND B. REILLY (2001): "The gender pay gap in the transition from communism: some empirical evidence," *Economic Systems*, 25, 287–304.

OSHCHEPKOV, A. (2021): "Gender Pay Gap in Russia: Literature Review and New Decomposition Results," *Gendering Post-Soviet Space*, 211–233.

Appendix

Table 11: List of agricultural products, raw materials and foodstuffs originating from the United States, countries of the European Union, Canada, Australia and the Kingdom of Norway, and that are banned for imports to the Russian Federation. Source: https://trade.ec.europa.eu/access-to-markets/en/barriers

Code	Description
0103	Live swine
0201	Meat of bovine animals, fresh or chilled
0202	Meat of bovine animals, frozen
0203	Pork, fresh, chilled or frozen
0207	Meat and edible offal of the poultry indicated in line 0105, fresh, chilled or frozen
0210	Meat and edible meat offal, salted, in brine, dried or smoked; edible flours and meals of meat or meat offal
0301	Live fish
0302	Fish, fresh or chilled, excluding fish fillets and other fish meat of heading 03.04.
0303	Fish, frozen, excluding fish fillets and other fish meat of heading 03.04
0304	Fish fillets and other fish meat (whether or not minced), fresh, chilled or frozen
0305	Fish, dried, salted or in brine; smoked fish, whether or not cooked before or during the smoking process; flours, meals and pellets of fish, fit for human consumption
0306	Crustaceans
0307	Molluscs
0308	Aquatic invertebrates other than crustaceans and molluscs
0401	Milk and cream, not concentrated nor containing added sugar or other sweetening matter
0402	Milk and cream, concentrated or containing added sugar or other sweetening matter
0403	Buttermilk, curdled milk and cream, yogurt, kephir and other fermented or acidified milk and cream, whether or not concentrated or containing added sugar or other sweetening matter or flavoured or containing added fruit, nuts or cocoa
0404	Whey

Continued on next page

Table 11 – continued from previous page

Code	Description
0405	Butter and other fats and oils derived from milk; dairy spreads
0406	Cheese and curd
0701	Potatoes, fresh or chilled
0702	Tomatoes, fresh or chilled
0703	Onions, shallots, garlic, leeks and other alliaceous vegetables, fresh or chilled
0704	Cabbages, cauliflowers, kohlrabi, kale and similar edible brassicas,
0705	Lettuce (Lactuca sativa) and chicory (Cichorium spp.)
0706	Carrots, turnips, salad beetroot, salsify, celeriac, radishes and similar edible roots
0707	Cucumbers and gherkins
0708	Leguminous vegetables
0709	Other vegetables
0710	Vegetables (uncooked or cooked by steaming or boiling in water), frozen
0711	Vegetables provisionally preserved
0712	Dried vegetables, whole, cut, sliced, broken or in powder, but not further prepared
0713	Dried leguminous vegetables, shelled, whether or not skinned or split
0714	Manioc, arrowroot, salep, Jerusalem artichokes, sweet potatoes and similar roots and tubers with high starch or inulin content; sago pith.
0801	Coconuts, Brazil nuts and cashew nuts
0802	Other nuts
0803	Bananas, including plantains
0804	Dates, figs, pineapples, avocados, guavas, mangoes and mangosteens
0805	Citrus fruit
0806	Grapes
0807	Melons (including watermelons) and papaws (papayas)
0808	Apples, pears and quinces

Continued on next page

Table 11 – continued from previous page

Code	Description
0809	Apricots, cherries, peaches (including nectarines), plums and sloes
0810	Other fruit
0811	Fruit and nuts, uncooked or cooked by steaming or boiling in water
0813	Fruit, dried, other than that of headings 08.01 to 08.06; mixtures of nuts or dried fruits of this Chapter
1601	Sausages and similar products of meat, meat offal or blood; final food products based thereon
1901	Finished products, including cheese and curd (cottage cheese) based on vegetable fats
2106	Foods (milk containing products on the basis of vegetable fats)
2501	Salt (including table salt and denatured salt) and pure sodium chloride, whether or not in aqueous solution or containing added anti-caking or free-flowing agents; sea water

Table 12: Whole Country. Impact of Chinese and European Competition on Gender Pay Gap, Dependent Variable: Gender Pay Gap by Industry and Year

	Panel A: Import Share					
	Whole country		East		West	
Import share (European)	-0.376^{**}	-0.438^{**}	-0.377	-0.427	-0.388^{*}	-0.473^{**}
	(0.181)	(0.180)	(0.323)	(0.326)	(0.218)	(0.219)
Import share (Chinese)		0.786		0.713		1.049
		(0.841)		(1.203)		(0.910)
Constant	0.545^{***}	0.328	0.614^{**}	0.416	0.549^{***}	0.260
	(0.137)	(0.275)	(0.254)	(0.432)	(0.163)	(0.287)
	Panel B: Import Penetration Ratio					
Import penetration ratio (European)	-0.747^{***}	-1.436^{***}	-1.652^{*}	-1.902^{**}	-1.195^{**}	-1.445^{***}
	(0.270)	(0.394)	(0.868)	(0.913)	(0.513)	(0.497)
Import penetration ratio (Chinese)		1.440		1.601		1.497
		(1.451)		(2.170)		(1.638)
Constant	0.583^{*}	0.548	1.077^{**}	0.782	0.803^{***}	0.531
	(0.325)	(0.348)	(0.409)	(0.566)	(0.224)	(0.397)
Industry f.e.	X	X	X	X	X	X
Year f.e.	X	X	X	X	X	X
Number of obs	54	54	54	54	54	54

Note: * - significant at 10%; ** - significant at 5%; *** - significant at 1%. Robust standard errors are in parentheses. In all specifications, the dependent variable is the gender pay gap from a Mincerian regression. All specifications are weighted by the inverse of the standard error of the gender pay gap coefficient to account for possible insignificant coefficients.

Table 13: Whole Country. Impact of European Competition on Gender Pay Gap, Dependent Variable: Gender Pay Gap

	Panel A: Import Share					
	First Differences			Always-Working Sample		
Import share	−0.414	−0.414	−0.401	−0.269	−0.300	−0.175
	(0.338)	(0.345)	(0.386)	(0.208)	(0.214)	(0.264)
Constant	−0.007	−0.007	0.042	−0.018	−0.054*	0.015
	(0.015)	(0.023)	(0.029)	(0.014)	(0.027)	(0.043)
	Panel B: Import Penetration Ratio					
Import penetration ratio	−1.178*	−1.177*	−1.224	−0.858*	−0.859*	−0.631
	(0.618)	(0.625)	(0.745)	(0.468)	(0.436)	(0.581)
Constant	−0.010	−0.008	0.034	−0.020	−0.055*	0.011
	(0.014)	(0.023)	(0.032)	(0.015)	(0.028)	(0.043)
Year f.e.			X			X
1 (Year after 2014)		X			X	
Number of obs	48	48	48	48	48	48

Note: * - significant at 10%; ** - significant at 5%; *** - significant at 1%. Robust standard errors are in parentheses.

In all specifications, the dependent variable is the gender pay gap from a standard Mincerian regression. The 'Always-Working' Sample is derived as follows: I consider only individuals who remain in the sample for two consecutive years (e.g. in both 2011 and 2012). I calculate the gender pay gap for each of these years and then consider the next pair of consecutive years (e.g. 2012 and 2013). Finally, I take the difference of the gap for the same year estimated on the different sample (e.g. estimated on the samples working in 2011-2012 and working in 2012-2013, I take the difference in the gender gap for 2012). This new measure I use as a dependent variable similar to the First Differences approach and run it on the differences in imports. All specifications involving import measures are weighted by the inverse of the standard error, which is an average of standard errors of the gender pay gap coefficient of the same year estimation (e.g. 2012 from the samples of 2011-2012 and 2012-2013) .

Table 14: Whole country. Impact of Chinese and European Competition on Gender Pay Gap, Dependent Variable: Gender Pay Gap by Industry and Year

	Panel A: Import Share					
	First Differences			Always-Working Sample		
Import share (European)	-0.677^{**}	-0.737^{**}	-0.920^{***}	-0.092	-0.261	-0.074
	(0.286)	(0.296)	(0.341)	(0.292)	(0.288)	(0.382)
Import share (Chinese)	1.069	1.264	2.034^{**}	-0.155	-0.034	-0.087
	(0.771)	(0.828)	(0.909)	(0.235)	(0.112)	(0.176)
Constant	-0.012	-0.028	0.028	-0.019	-0.053^{*}	0.015
	(0.016)	(0.025)	(0.033)	(0.015)	(0.028)	(0.043)
	Panel B: Import Penetration Ratio					
Import penetration ratio (European)	-1.562^{**}	-1.598^{**}	-1.825^{**}	-0.640	-0.879	-0.498
	(0.705)	(0.741)	(0.855)	(0.606)	(0.564)	(0.751)
Import penetration ratio (Chinese)	1.304	1.420	2.217	-0.177	0.009	-0.111
	(1.311)	(1.419)	(1.557)	(0.193)	(0.175)	(0.261)
Constant	-0.014	-0.021	0.024	-0.022	-0.055^{*}	-0.011
	(0.015)	(0.026)	(0.036)	(0.015)	(0.028)	(0.044)
Year f.e.			X			X
1 (Year after 2014)		X			X	
Number of obs	48	48	48	48	48	48

Note: * - significant at 10%; ** - significant at 5%; *** - significant at 1%. Robust standard errors are in parentheses. In all specifications, the dependent variable is the gender pay gap from a Mincerian regression.The 'Always-Working' Sample is derived as follows: I consider only individuals who remain in the sample for two consecutive years (e.g. in both 2011 and 2012). I calculate the gender pay gap for each of these years and then consider the next pair of consecutive years (e.g. 2012 and 2013). Finally, I take the difference of the gap for the same year estimated on the different sample (e.g. estimated on the samples working in 2011-2012 and working in 2012-2013, I take the difference in gender gap for the 2012 year). I use this new measure as a dependent variable similar to the First Differences approach and run it on the differences in imports. All specifications involving import measures are weighted by the inverse of the standard error, which is an average of standard errors of the gender pay gap coefficient of the same year estimation (e.g. 2012 from the samples of 2011-2012 and 2012-2013) .

Table 15: Impact of Chinese Competition (only) on Gender Pay Gap, Dependent Variable: Gender Pay Gap by Industry and Year

	Panel A: Import Share					
	Whole Country		East		West	
Import share (Chinese)	0.083	0.090	−0.340	−0.192	0.253	0.314
	(0.757)	(0.776)	(1.238)	(1.281)	(0.827)	(0.798)
Constant	0.287	0.285	0.402	0.368	0.253	0.240
	(0.251)	(0.255)	(0.401)	(0.408)	(0.294)	(0.290)
	Panel B: Import Penetration Ratio					
Import penetration ratio (Chinese)	−0.361	−0.383	−1.095	−0.857	−0.371	−0.296
	(1.284)	(1.315)	(2.126)	(2.189)	(1.581)	(1.528)
Constant	0.410	0.414	0.572	0.523	0.437	0.423
	(0.327)	(0.332)	(0.537)	(0.546)	(0.420)	(0.410)
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

Note: * - significant at 10%; ** - significant at 5%; *** - significant at 1%. Robust standard errors are in parentheses.
In all specifications, the dependent variable is the gender pay gap from a Mincerian regression.

Table 16: Impact of Competition on Employment by Education, Dependent Variable: Share of Education group by Industry and Year

	Panel A: Import Share		
	HEduc	SpecEduc	No Educ
Import share (European)	0.083**	0.162	−0.074**
	(0.032)	(0.099)	(0.026)
Constant	0.189***	0.682***	0.301***
	(0.022)	(0.063)	(0.019)
	Panel B: Import Penetration Ratio		
Import penetration ratio (European)	0.187**	−0.056	−0.131
	(0.086)	(0.054)	(0.082)
Constant	0.165***	0.528***	0.308***
	(0.038)	(0.023)	(0.036)
Industry f.e.	X	X	X
Year f.e.	X	X	X
Number of obs	30	30	30

Note: * - significant at 10%; ** - significant at 5%; *** - significant at 1%. Robust standard errors are in parentheses.

The dependent variable is the share of educational group (e.g. share of higher educated people) in each industry j in year t. The educational groups are defined following Rosstat methodology. Namely, HEduc corresponds to individuals with higher education, SpecEduc corresponds to the individuals with Vocational (Specialized) education, No educ corresponds to the individuals having no education other than school i.e. who graduated after grade 9 or 11. Data source: Rosstat, Eurostat.