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War Effects on the labor market: Corporate employment, productivity, and wages in Ukraine

Andriy Tsapin
National Bank of Ukraine

Chemin Eugène-Rigot 2
P.O. Box 136
CH - 1211 Geneva 21
Switzerland

Bilateral Assistance & Capacity Building for Central Banks

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Abstract

This study examines the effects of the russia's full-scale invasion on the Ukrainian corporate labor market. We use the DID technique to analyze a panel data set of over 100,000 firms linked to geolocation and industry data spanning 2021-2024 and show how war harms the corporate labor market in Ukraine. Specifically, our findings evidence that destructive military shocks adversely affected the number of employees hired, productivity, and wages paid in the corporate sector. We emphasize that the war effects are heterogeneous across firm size and labor intensity and depend on external debt and bank financing. The results obtained have considerable policy implications, making them valuable to both researchers and policymakers.

Keywords: Labor market, War, employment, productivity, wages, Ukraine

JEL: H56, J21, J23, J31, O12

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Introduction

After almost a decade of hybrid warfare, russia dared to launch a full-scale invasion of Ukraine in February 2022, further disrupting the already depleted Ukrainian economy. The shocks of the war, as expected, created extra challenges for labor markets and policymakers, who are concerned with assessing the current state of labor market conditions (essential components of macroeconomic forecasting) to make prudent economic and monetary policy decisions amid war uncertainty.

In the acute phase of the war, Ukraine serves as an excellent laboratory for investigating the labor market under extreme stress, as researchers have modern opportunities to identify war shocks and collect data from alternative sources despite severe wartime conditions.[1]

Tsapin and Zholud (2025) review alternative sources for the labor market statistics and provide evidence that regional and demographic disparities remained pronounced during the war: Kyiv experienced lower unemployment, the eastern regions of the country were hardest hit, and the urban–rural gap narrowed after 2023. Their investigation emphasizes the need to account for profound structural changes in the labor market, examining its dynamics in Ukraine during the full-scale russian invasion.

Onyshchenko et al. (2025) study the effect of military occupation on firm performance during russia's invasion of Ukraine. Using Orbis data for 2022-2023, the paper finds that firms in temporarily occupied but soon-liberated areas experienced moderate declines in sales, followed by a recovery, whereas those under prolonged occupation suffered large and persistent losses. Employment dynamics closely mirror sales, whereas firm capital remains largely unaffected, suggesting that labour adjustments, rather than capital destruction, are a key driver of the decline in performance.

[1] To get some ideas of how to identify war shocks, see, for example, Zhukov (2023), who introduces near-real-time data on Russia's full-scale invasion of Ukraine. His data project – VIINA (Violent Incident Information from News Articles) project – parses news reports from Ukrainian and Russian media, georeferences them, and classifies them into standard event categories (e.g. artillery shelling) through machine learning.

Air Raid Alert Map of UkraineUA

Anastasia et al. (2026) examine the large labor supply and reallocation shocks of war in Ukraine and conclude that wage flexibility and firms' adaptability in recruitment policies support the resilience of labor outcomes. Vacancy-filling rates and matching efficiency declined modestly, and only along the frontline and in occupied regions is there evidence of labor market shutdowns.

The aim of this study is to fill the knowledge gap regarding the effects of war on the corporate labor market. We employ the difference-in-differences (DID) technique to estimate employment, labor productivity, and wages of Ukrainian firms in war-affected (treatment) regions of Ukraine relative to distant (control) areas.

The research findings in this paper show that destructive war shocks significantly reduce firm employment, productivity, and wages of Ukrainian firms in the war-exposed regions. Moreover, we find that the effects are heterogeneous across firm size and labor intensity and depend on external debt and bank financing.

The study's results can deepen our understanding of labor market prospects and inform improvements to the calibration of macroeconomic models in response to military shocks. Our paper is a policy-oriented study that assesses the effects of war at a relevant moment in the current military upheaval. The results, while concise, have significant policy implications, making them valuable for both researchers and policymakers.

This paper contributes to the growing body of research on the consequences of war for labor markets. Existing micro-level studies are primarily based on surveys and examine the impact of war on households, whereas firms have received far less attention (Brück et al., 2013; Onyshchenko et al., 2025). The scarcity of such research is primarily due to the challenges of collecting firm-level information during periods of active conflict.

Additionally, our findings can advance investigations on the heterogeneity in the war's impact on the labor market. In particular, the evidence presented in this paper suggests that it is promising to further examine the roles of labor intensity and external financing in resilience to military shocks.

This paper is organized as follows. The next section introduces the methodology of this research. Section 3 describes the data used in this study to estimate the impact of war on

corporate employment, labor productivity, and wages. Section 4 presents the estimation results. Section 5 concludes.

2. Methodology

To capture causal effects of exogenous events such as natural disasters (Chen, X. & Chang, C.-P., 2021), wars (Pham et al., 2021), and policy decisions on affected/ treated units, researchers typically use the difference-in-differences technique (Bosco & Maranzano , 2025). DiD methods use the observed realisations of the response variable in comparable untreated/control units. The latter are samples of units drawn from the same population but not exposed to the event under investigation.

We estimate the following difference-in-differences model, which captures cross-sectional variation in exposure to various war events and in firm performance during 2022-2024.

We regress the variable(s) of interest, log y_{irt}, on the war event shock at time *t* within firm r's region, while controlling for various firm-level characteristics.

Log $y_{irt} = \alpha_{jt} + \nu_{rt} + \text{war}_{rt} + \Upsilon (war_{rt} * Frontline_{irt}) + \eta' X_{i,t-1} + \varepsilon_{irt}$,

where y_{irt} can be either the firm's employment, labor productivity, or wages; i denotes a firm; t denotes a year; r represents the firm's region. α_i is the firm's fixed effect, α_{jt} is the sector/industry *j* by year *t* fixed effect, and ν_{rt} captures regional effects at time t. Note that we run and choose among the multiple levels of fixed effects and multi-way clustering. The specification above is considered less susceptible to omitted variable bias than the peer ones.

$X_{i,t-1}$ is a vector of firm-level controls, and ε_{irt} is an idiosyncratic firm-level shock. The variable frontline equals one if hostilities occurred in this region in year t. Our baseline firm controls, $X_{i,t-1}$, are firm size, a share of current assets in total assets, and leverage, all measured at the end of year $t-1$ to ensure exogeneity with respect to the war shock. Firms on the Frontline (regions) are treated as sensitive to the shock of war, whereas companies from Distant areas

are considered members of the control group. We identify regions exposed to war shocks – the frontline (treatment) and assign firms in these regions a value of 1.[2]

Finally, it is important to check whether the necessary assumptions for DID application are met: 1) the parallel trend hypothesis, 2) the no anticipation assumption, and 3) the stable unit treatment value assumption. Testing of these hypotheses will be carried out in the next section

3. Data

This paper examines the effects of war on the corporate labor market, focusing on firms' employment, labor productivity, and wages paid after the full-scale invasion. To do so, we combine the rich balance-sheet data on firm performance from the State Statistic Services of Ukraine with information on the firm's exposure to war events during the full-scale invasion of Ukraine in 2022-24. This section describes the data used in this research.

A panel dataset containing the number of employees, industry codes, and regions of location. After screening, our sample contains more than 100,000 unique firms annually, except for the year of the invasion. Only the largest firms submitted reports for the first year of active military operations.

We exclude firms with clearly erroneous values, such as negative total assets, employment, sales, or tangible fixed assets. Firm-year observations are dropped if total assets are zero, missing, or implausible. We also remove observations that violate basic accounting identities. To support panel analyses, we retain only firms with at least four years of consecutive data and a known geographic location. The main limitation of the data is its relatively low (annual) frequency due to the nature of balance sheet data. Firms' exposure to war events is identified by their region/ postal code[3].

[2] See Paulo Guimaraes and Pedro Portugal (2010) for detail on estimation approach.

[3] Postal codes are used for more accurate identification at the robustness check stage.

We restrict the analysis to non-financial corporations and exclude banks, other financial institutions, and sectors with extremely atypical dynamics. Firms in our sample belong to Agriculture, Mining, Food, Clothing, Wood & Paper Processing, Oil, Chemical & Related Manufacturing, Pharma, Plastic, Glass & Minerals, Metallurgy, Electronics, Machinery, Hardware, Energy, Water Supply, Construction, Wholesale trade, Transport, Communications, Admin Services, Real Estate, Research & Advertizement, Education, Other Services.

Table 1 presents descriptive statistics for the variables used in this study. To analyze the remarkable heterogeneity in war exposure, we trace how differences between front-line and more insulated areas evolve over the war period.

Firms in the frontline regions are more homogeneous than their peers in more distant areas (to see the differences in dynamics, please compare Table 2 and Table 3). Frontline firms are, on average, a bit larger on the eve of a full-scale invasion, but the differences gradually disappear over the course of hostilities.

To assess the feasibility of implementing the DID method, it is necessary to ensure that several conditions are met. The statistical assumptions necessary for the causal effect identification are: 1) the parallel trend hypothesis, 2) the no anticipation assumption, and 3) the stable unit treatment value assumption.

We compare the evolution of firms in treatment (war-affected) and control groups to reveal pre-war parallel trends that serve as necessary conditions for DID.

Figure. Employment

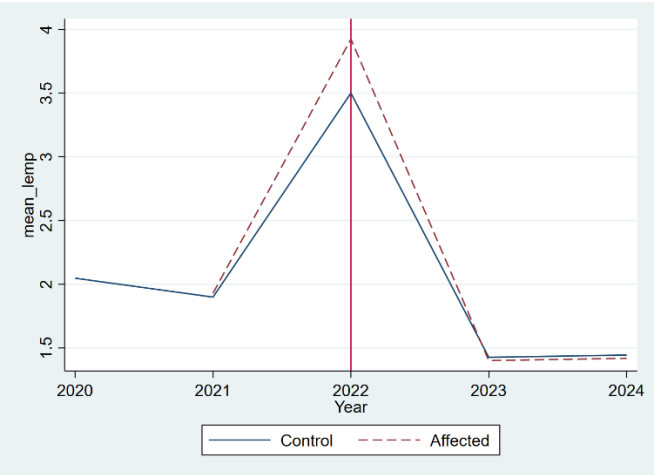


Figure 2. Labor Productivity

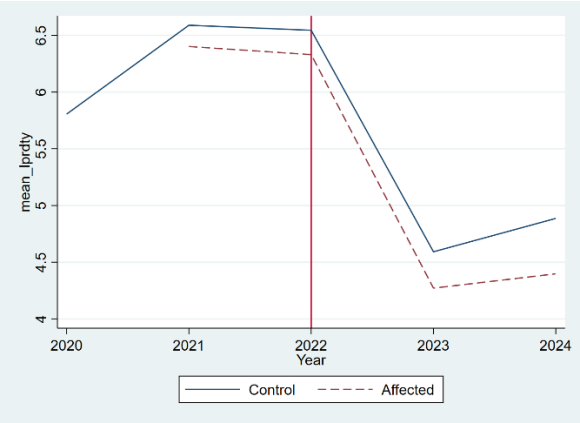
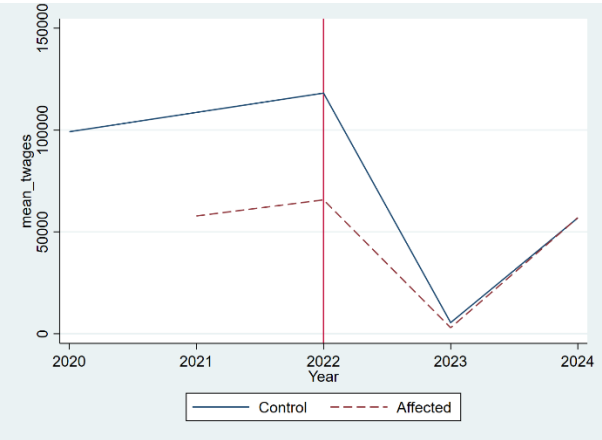


Figure 3. Wages



While labor productivity plateaued in both subsamples of firms in 2021 after a period of moderate growth, employment and wages were on an upward parallel trend on the eve of the start of the active war. It is evident that, in 2022, there was a trend reversal across all three labor market characteristics: employment, labor productivity, and wages. Moreover, the Ukrainian government and the President assure economic agents that there is no basis for panic.[4] This fact speaks in favor of the absence, or rather the restraint, of the expectation of war in society. Thus, the key assumptions for the causal interpretation of the DiD estimate are kept.

[4] Ukraine to the world: keep calm and stop spreading panic

It is worth noting that since the beginning of the war, firms from remote regions have gradually converged in terms of the number of employees to firms located closer to the areas of hostilities, and since 2024 they have even begun to hire relatively more employees (see Figure 1). The latter can be explained by productivity divergence and simultaneous wage convergence after 2023 between firms operating in frontline and remote regions of Ukraine (Figure 2 and Figure 3).

4. Results

Table 4 presents the estimation results of the war effects on the variables of interest. Our key objective is to estimate the coefficients for firms in war-exposed regions (the treated) after the event, yielding the average treatment/war effect on the treated (ATET). As expected, we find that these coefficients for the treated during the war are negative and highly significant (at the 1% level or even better).

The next step in our research is to include covariates in the DID models to control for potential confounding and to test various fixed effects to ensure consistency of the outcomes. The following tables present estimates of corporate employment, productivity, and wages (Table 5, Table 6, and Table 7, respectively). It is crucial that all additional regressions confirm the conclusions above. The destructive military shocks are found to significantly reduce the number of employees hired, productivity, and wages in the corporate sector.

Note also that the estimated coefficients summarize the timing of war. An active war started once (in 2022), and we assume the war does not vary across treated units. It does not yet list post-invasion follow-up years. The ATET estimates from the beginning are adjusted for panel and time effects, while shocks can occur at different times.

By default, difference-in-differences (DiD) analysis assumes that the treatment effect is constant over time, producing a single average effect for all post-treatment periods. The basic DID cannot capture the dynamics of the war (treatment effect), such as whether the effect occurs immediately. However, the events and effects of war evolve over time rather

than remaining constant. The impact of war on the labor market can fade over time or intensify through the implementation of certain policy tools[5].

An event study relaxes this assumption by allowing treatment effects to vary over time. It estimates separate treatment effects for each period relative to the "treatment", typically covering multiple periods before and after the policy is implemented. To trace the war's effects more closely, we disaggregate the war shock by year, run the most appropriate regressions, and visualize key coefficients.

The plotted study coefficients are shown in Figure 1. As shown, the average effect on the firms in the affected war-exposed regions is negative and statistically significant at the 1% level. It means that military shocks have an adverse effect on all variables of interest. Wages paid by the corporate sector appear to be the most sensitive to the war shock and to mirror labor productivity, whereas employment remains relatively persistent.

The graphs show the dynamics of corporate employment, labor productivity, and wages for 3 years following the onset of the war in Ukraine. The post-war coefficients are negative and statistically significant at a 1 percent level (the confidence intervals do not intersect zero). The previously positive trend reversed in 2022 following a full-scale invasion by the northeastern neighbour, indicating that these changes can be attributed to the war rather than to the persistence of prior differences.

As shown, large firms are more sensitive to the effects of war on employment, productivity, and wages paid due to war-related shocks, whereas war shocks remain almost negligible for smaller firms (see Figure 5). Moreover, capital-intensive firms experience significantly greater labor-market losses than labor-intensive firms (see Figure 6). Finally, firms with external financing and bank loans appear to be more resilient to military shocks (Figures 7 and 8, respectively).[6]

[5] A subject for separate research.
[6] To investigate further.

5. Conclusions

The results of this study confirm that destructive military shocks adversely affected the number of employees hired, labor productivity, and wages in the corporate sector.

Large firms are more affected by war-related disruptions to employment, productivity, and wages. In contrast, smaller firms experience minimal effects from these war shocks. Additionally, capital-intensive firms experience greater labor-market losses than labor-intensive firms. Lastly, firms that rely on external financing, particularly bank loans, tend to be more resilient in the face of military shocks. The latter points warrant further investigation.

The conclusions of this study align with prior evidence on labor market developments in wartime contexts (Onyshchenko et al., 2025; Anastasia et al., 2026). However, we extend previous findings and open up additional avenues for further research. Our findings have significant policy implications, making them useful to policymakers and opening promising avenues for future research in this field.

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Tables

Table 1. Descriptive statistics: 2021-2024

Variable	Mean	Std. Dev.	Min	Max
2021				
employees	**41,66**	956,28	1,00	232837,00
*logemp	**1,90**	1,42	0,00	20,92
prodty	**1996,49**	3687,08	0,10	31536,00
*lprdty	**6,58**	1,77	-5,53	17,64
wages	**17836,30**	24856,88	1,00	132079,00
*lwages	**8,86**	2,26	0,00	18,98
logsize	**7,91**	2,64	0,10	13,45
sta_ta	**0,75**	0,31	0,00	1,00
leverage	**0,80**	1,72	0,00	28,30
bc_ta	**0,21**	0,15	0,00	0,92
N	104,776			

- dependent variables.

Variable	Mean	Std. Dev.	Min	Max
2022				
employees	**219,33**	2148,58	1,00	214764,00
*logemp	**3,53**	1,96	0,00	12,28
prodty	**1953,04**	3934,15	0,10	31462,44
*lprdty	**6,53**	1,96	-5,54	14,62
wages	**13651,19**	21649,58	0,79	132013,40
*lwages	**8,34**	2,39	-0,24	19,59
logsize	**7,05**	2,75	0,00	13,45
sta_ta	**0,77**	0,31	0,00	1,00
leverage	**0,88**	2,05	0,00	28,30
bc_ta	**0,20**	0,17	0,00	1,00
N	14,961			

- dependent variables.

Variable	Mean	Std. Dev.	Min	Max
2023				
employees	**18,62**	511,04	0,10	187620,00
*logemp	**1,42**	1,15	0,00	12,14
prodty	**1204,18**	2852,18	0,09	31525,39
*lprdty	**4,57**	3,35	-11,89	15,70
wages	**569,22**	5231,10	0,75	131837,10
*lwages	**0,08**	1,81	-0,29	20,50
logsize	**7,01**	2,77	0,10	13,45
sta_ta	**0,78**	0,31	0,00	1,00
leverage	**0,83**	2,02	0,00	28,30
bc_ta	**0,04**	0,12	0,00	1,00
N	294,194			

- dependent variables.

Variable	Mean	Std. Dev.	Min	Max
2024				
employees	**17,46**	401,94	1,00	178616,00
logemp*	**1,44**	1,15	0,00	12,09
prodty	**1314,98**	2923,19	0,08	31533,16
lprdty*	**4,83**	3,31	-9,32	15,70
wages	**15605,21**	23023,20	1,34	132094,70
lwages*	**7,67**	3,49	-0,40	17,16
logsize	**7,20**	2,71	0,10	13,45
sta_ta	**0,78**	0,31	0,00	1,00
leverage	**0,78**	1,89	0,00	28,29
bc_ta	**0,04**	0,11	0,00	0,97
N	289,261			

- dependent variables.

Employees is the number of employees. Logemp is calculated as the natural logarithm of the number of employees. prodty is calculated as the ratio of net sales to the number of employees.
Lwages is calculated as the natural logarithm of the wages paid by the firm. Logsize is calculated as the natural logarithm of total assets. sta_ta is the short-term assets to total assets ratio. Leverage is the ratio of current liabilities to total assets. Bc_ta is the ratio of bank loans to total assets.

Table 2. Descriptive statistics: Firms in Distant Regions.

Distant	2021		2022		2023		2024	
Variable	**Mean**	**Std. Dev.**	**Mean**	**Std. Dev.**	**Mean**	**Std. Dev.**	**Mean**	**Std. Dev.**
employees	**41,5**	977,4	**223,5**	2232,6	**18,7**	525,1	**17,6**	424,9
logemp	**1,9**	1,4	**3,5**	2,0	**1,4**	1,1	**1,4**	1,1
prodty	**5088,6**	#######	**6902,9**	48486,6	**2015,7**	22595,3	**2235,5**	24787,1
lprdty	**6,6**	1,8	**6,5**	2,0	**4,6**	3,3	**4,9**	3,3
wages	**108649,5**	#######	**118097,5**	########	**5444,9**	########	**55768,1**	558958,3
lawages	**4,9**	1,0	**4,6**	1,2	**-1,1**	1,7	**4,7**	1,4
twages	**8,9**	2,3	**8,3**	2,4	**0,1**	1,8	**7,5**	3,7
sta_ta	**0,7**	0,3	**0,8**	0,3	**0,8**	0,3	**0,8**	0,3
leverage	**0,8**	1,7	**0,9**	2,1	**0,8**	2,0	**0,8**	1,9
bc_ta	**0,2**	0,2	**0,2**	0,2	**0,0**	0,1	**0,0**	0,1
logsize	**7,9**	2,6	**7,0**	2,7	**7,0**	2,8	**7,2**	2,7

Table 3. Descriptive statistics: Firms in Frontline Regions.

Frontline	2021		2022		2023		2024	
Variable	**Mean**	**Std. Dev.**	**Mean**	**Std. Dev.**	**Mean**	**Std. Dev.**	**Mean**	**Std. Dev.**
employees	**44,4**	349,3	**168,4**	370,1	**17,8**	104,1	**16,6**	144,1
logemp	**1,9**	1,5	**3,9**	1,7	**1,4**	1,2	**1,4**	1,1
prodty	**3376,2**	22710,0	**2860,2**	15960,3	**1240,2**	5969,9	**1811,3**	29230,4
lprdty	**6,4**	1,7	**6,3**	1,8	**4,3**	3,4	**4,4**	3,4
wages00	**57816,2**	#######	**65723,0**	#######	**2930,4**	#######	**56541,3**	#######
lawages	**4,7**	0,8	**4,6**	1,0	**-1,2**	1,8	**4,4**	1,4
twages	**8,9**	2,1	**8,5**	2,1	**0,0**	1,7	**7,7**	3,3
sta_ta	**0,7**	0,3	**0,7**	0,3	**0,7**	0,3	**0,8**	0,3
leverage	**0,8**	1,8	**0,7**	1,8	**0,7**	1,9	**0,7**	1,8
bc_ta	**0,2**	0,1	**0,2**	0,1	**0,0**	0,1	**0,0**	0,1
logsize	**7,7**	2,6	**7,0**	2,7	**6,9**	2,8	**7,1**	2,7

Table 4. Effects of War on Labor Market in Ukraine.

	Employment	Productivity	Wages
	b/se	b/se	b/se
ATET			
Frontline vs. Distant	-0.019***	-0.098***	-0.150***
	(0.002)	(0.008)	(0.031)
Controls			
logsize	0.109***	0.728***	0.457***
	(0.001)	(0.004)	(0.017)
leverage	0.000***	0.000***	0.000**
	(0.000)	(0.000)	(0.000)
Sta/ta	-0.001	0.493***	0.269***
	(0.007)	(0.107)	(0.081)
Year=2021	0.000	0.179***	0.117***
	(0.000)	(0.008)	(0.018)
Year=2022	-0.036***	-0.584***	-0.448***
	(0.004)	(0.008)	(0.019)
Year=2023	-0.157***	-0.964***	-1.315***
	(0.002)	(0.009)	(0.027)
Year=2024	-0.185***	-0.910***	-0.567***
	(0.002)	(0.009)	(0.023)
N	826,525	1,198,341	433,857

* p<0.10, ** p<0.05, *** p<0.01

Logemp is calculated as the natural logarithm of the number of employees.
lprdty is calculated as as the natural logarithm of the ratio of net sales to the number of employees.
Lwages is calculated as the natural logarithm of the wages paid by the firm. Logsize is calculated as the natural logarithm of total assets. Leverage is the ratio of current liabilities to total assets.
sta_ta is the short-term assets to total assets ratio.

Table 5. Effects of War on Labor Market in Ukraine: Employment

	DID FE	DID FE2	DID FE3
	b/se	**b/se**	**b/se**
War	-0.114***	-0.184***	-0.184***
	(0.003)	(0.003)	(0.003)
War × Frontline	-0.187***	-0.179***	-0.179***
	(0.010)	(0.011)	(0.012)
L.logsize		0.082***	0.082***
		(0.001)	(0.001)
L.sta_ta		-0.027***	-0.026***
		(0.006)	(0.006)
L.leverage		0.005***	0.005***
		(0.001)	(0.001)
Firm FE	+		
Industry FE		+	
Region FE		+	
Industry FE ×Region FE			+
F	1413.862	2368.578	2337.906
N	673,326	510,386	510,306

* p<0.10, ** p<0.05, *** p<0.01

Logemp is calculated as the natural logarithm of the number of employees.
Logsize is calculated as the natural logarithm of total assets. Leverage is the ratio of current liabilities to total assets.
sta_ta is the short-term assets to total assets ratio.

Table 6. Effects of War on Labor Market in Ukraine: Labor Productivity

	DID FE	DID FE2	DID FE3
	b/se	b/se	b/se
War	-0.590***	-0.675***	-0.678***
	(0.011)	(0.012)	(0.012)
War × Frontline	-0.700***	-0.587***	-0.602***
	(0.041)	(0.048)	(0.049)
L.logsize		0.210***	0.210***
		(0.004)	(0.004)
L.sta_ta		0.076***	0.075***
		(0.024)	(0.024)
L.leverage		0.020***	0.020***
		(0.003)	(0.003)
Firm FE	+	+	+
Industry FE		+	
Region FE		+	
Industry FE ×Region FE			+
F	1876.099	1187.828	1175.012
N	600,994	471,136	471,058

* p<0.10, ** p<0.05, *** p<0.01

lprdty is calculated as as the natural logarithm of the ratio of net sales to the number of employees. Logsize is calculated as the natural logarithm of total assets. Leverage is the ratio of current liabilities to total assets.
sta_ta is the short-term assets to total assets ratio.

Table 7. Effects of War on Labor Market in Ukraine: Wages

	DID FE	DID FE2	DID FE3
	b/se	b/se	b/se
War	-0.772***	-0.981***	-0.985***
	(0.028)	(0.034)	(0.035)
War × Frontline	-0.520***	-0.555***	-0.562***
	(0.107)	(0.131)	(0.138)
L.logsize		0.572***	0.568***
		(0.017)	(0.018)
L.sta_ta		0.143*	0.161*
		(0.083)	(0.083)
L.leverage		-0.025*	-0.023
		(0.014)	(0.014)
Firm FE	+		
Industry FE		+	
Region FE		+	
Industry FE ×Region FE			+
F	432.432	392.419	374.646
N	56,501	39,636	39,521

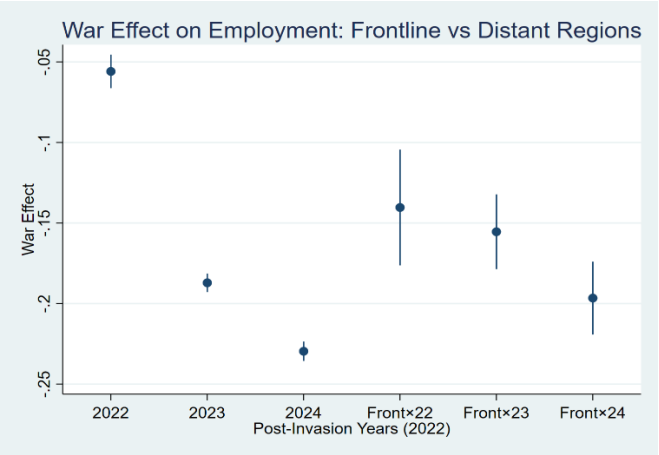
* p<0.10, ** p<0.05, *** p<0.01

Lwages is calculated as the natural logarithm of the wages paid by the firm. Logsize is calculated as the natural logarithm of total assets. Leverage is the ratio of current liabilities to total assets. sta_ta is the short-term assets to total assets ratio.

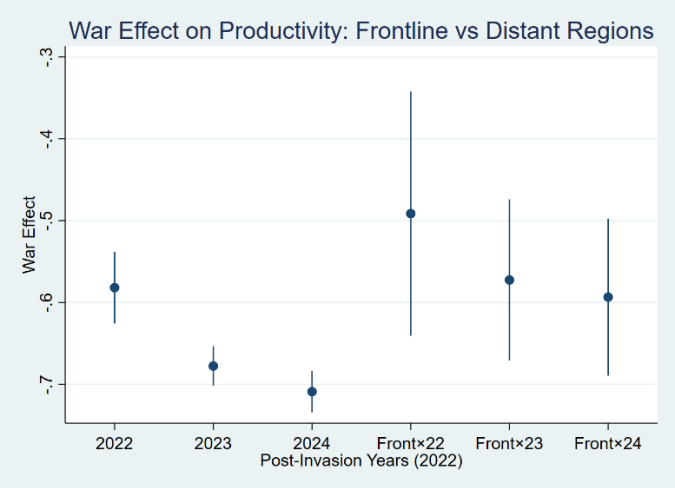
Figures

Figure4. Annual War Effects

Employment



Labor Productivity



Wages

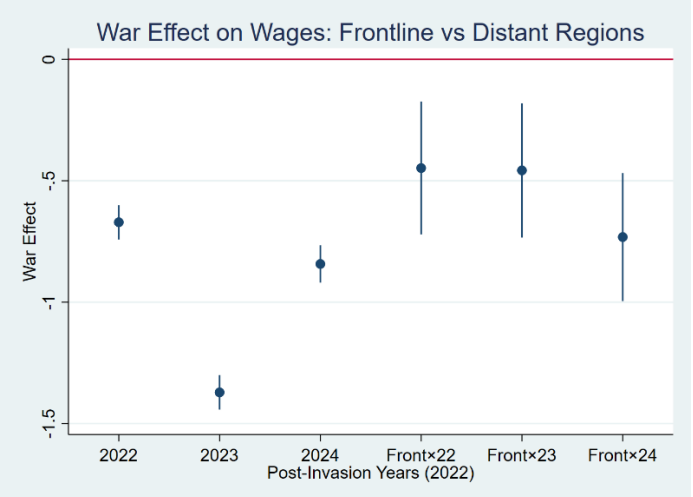
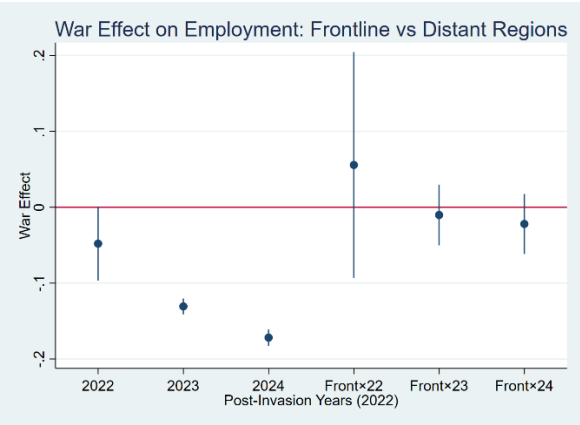
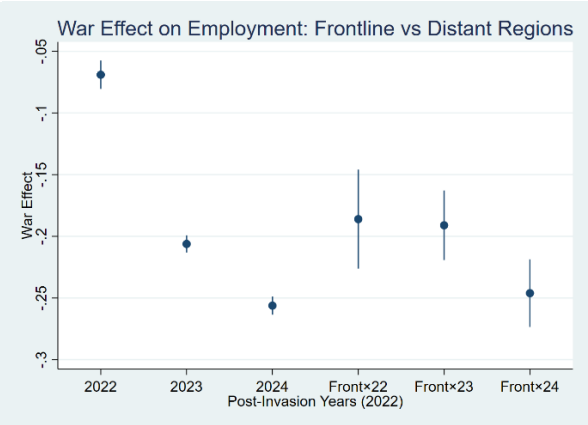


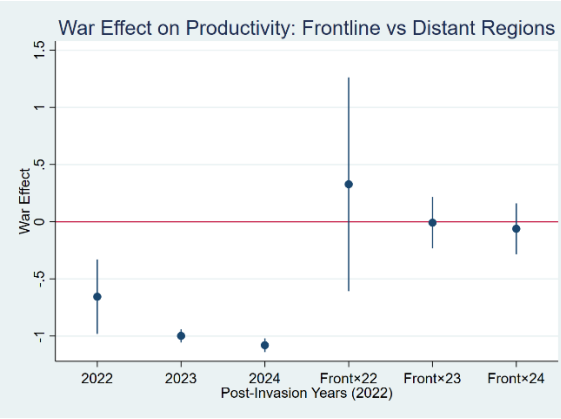
Figure5. Annual War Effects: Small vs Large Firms

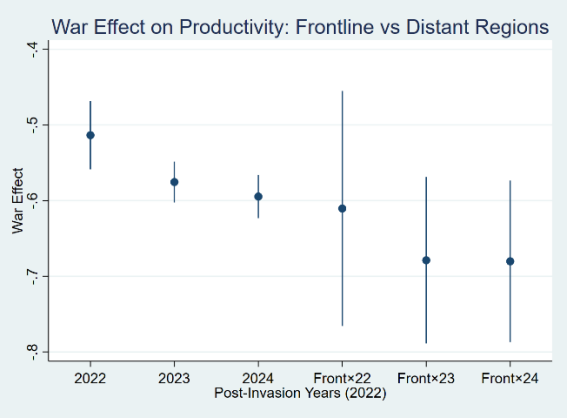
a/ Small Firms

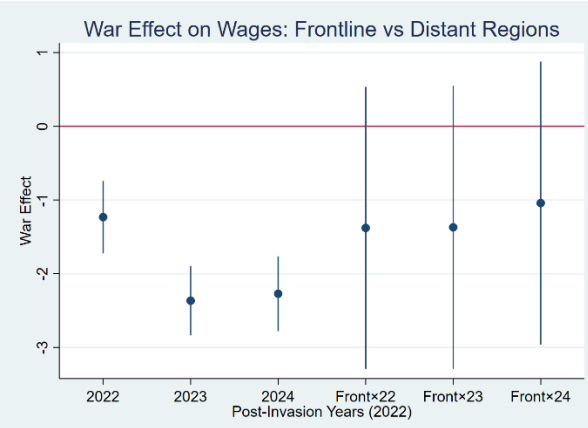


b/ Large Firms









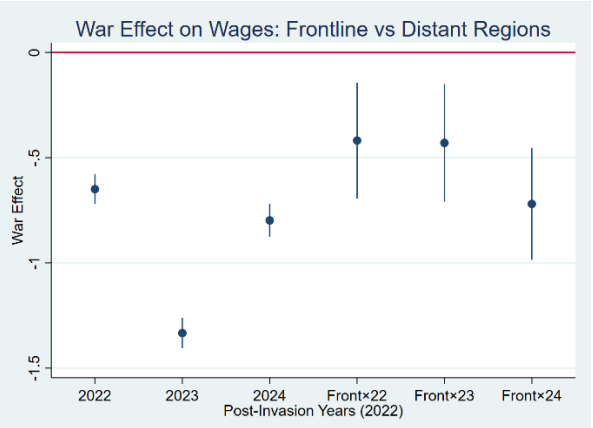
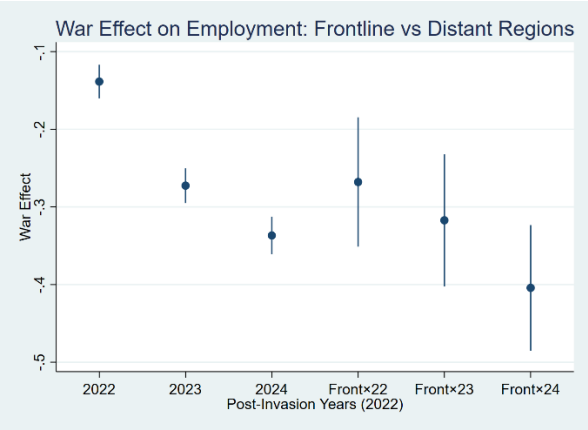
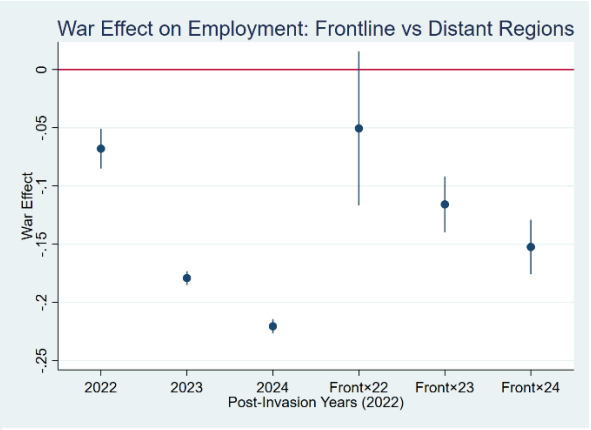


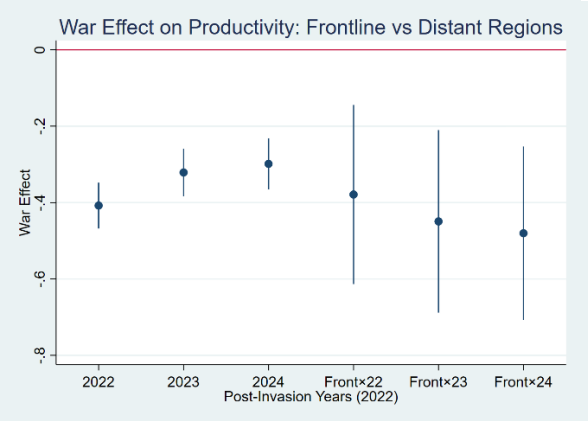
Figure 6. Annual War Effects for Firms: Capital- vs Labor-intensive

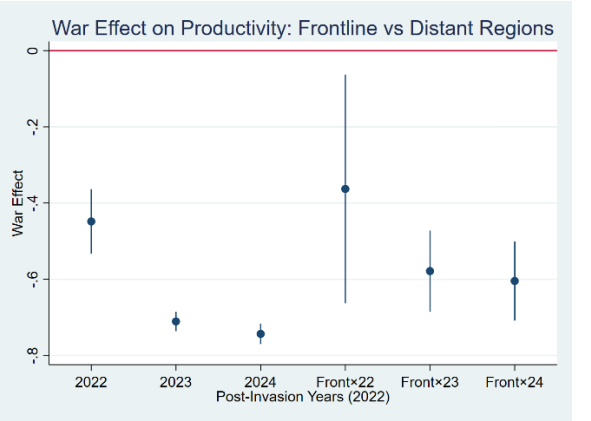
Employment



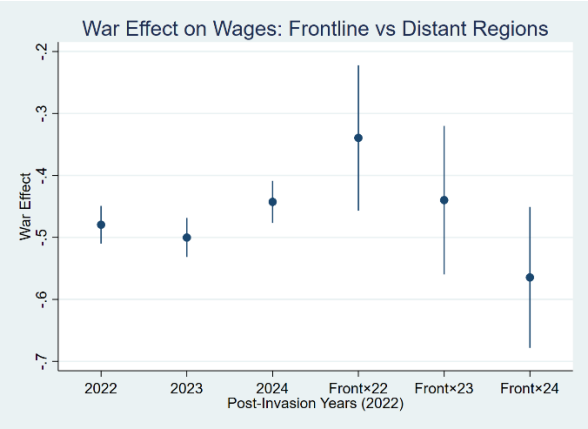


Labor Productivity





Wages



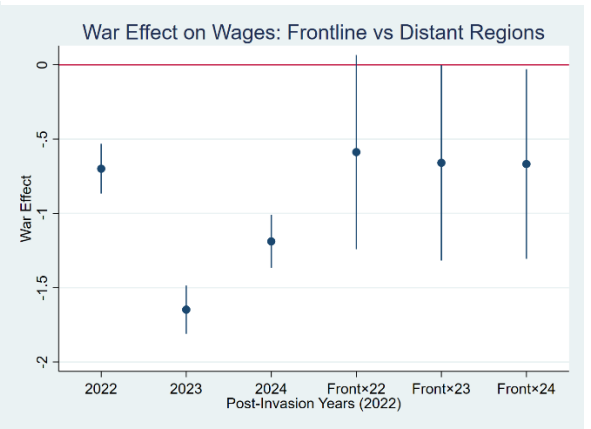
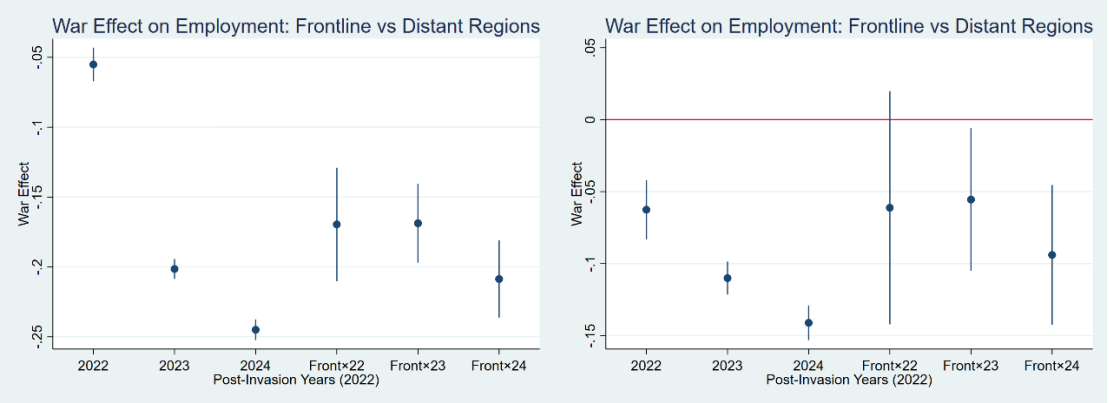


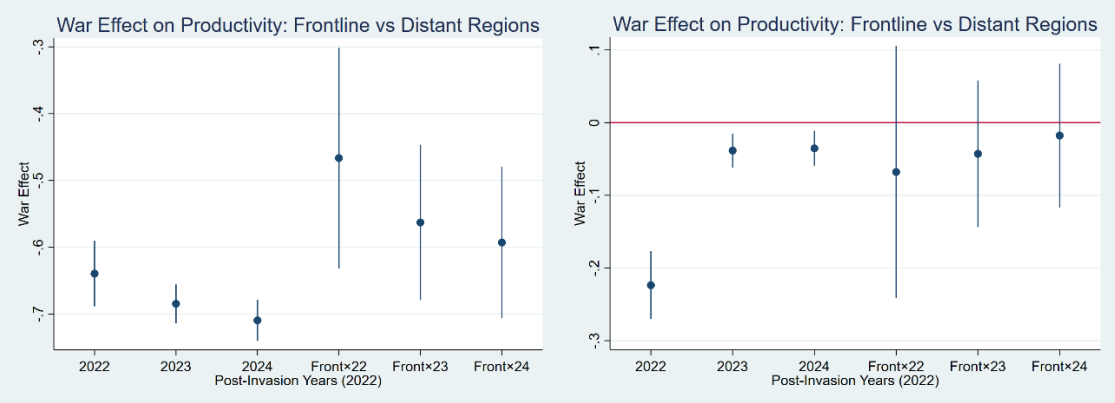
Figure 7. Annual War Effects for Firms with Low Leverage vs. High Leverage

a) Low leverage **b) High leverage**

Employment



Labor Productivity



Wages

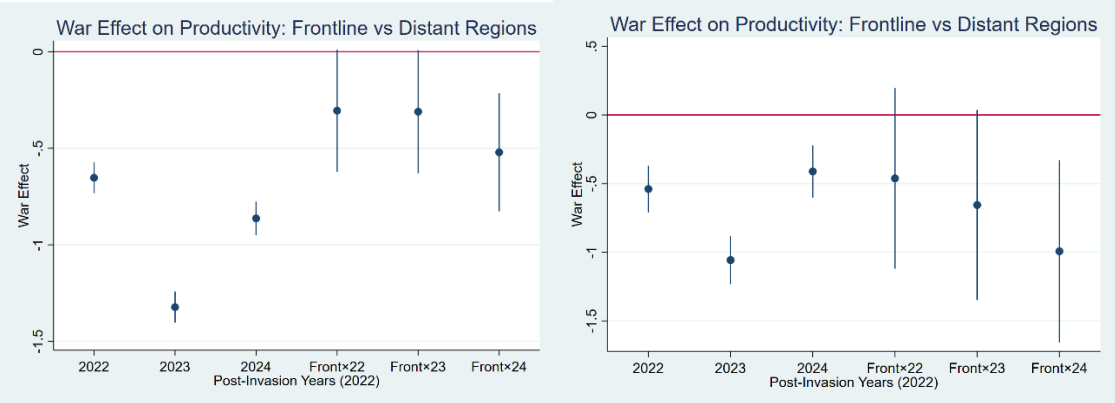
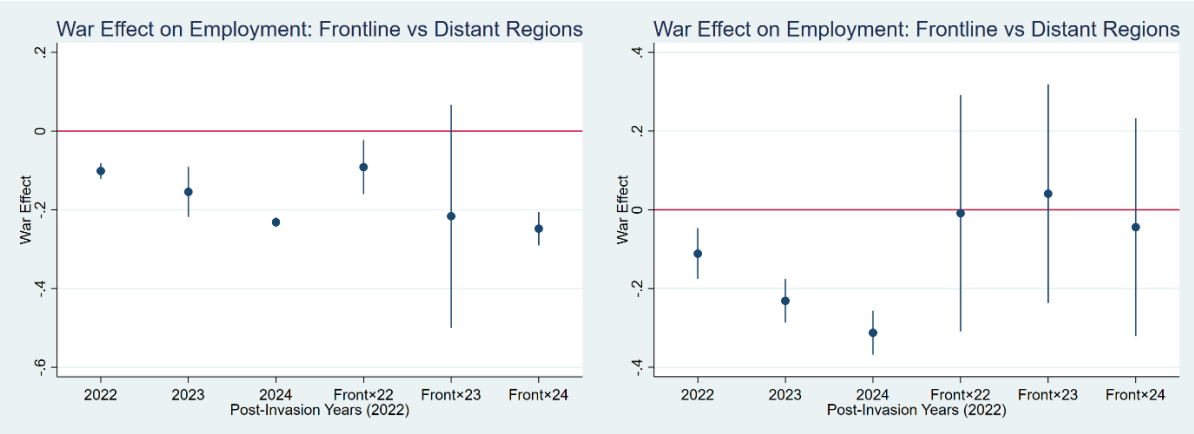


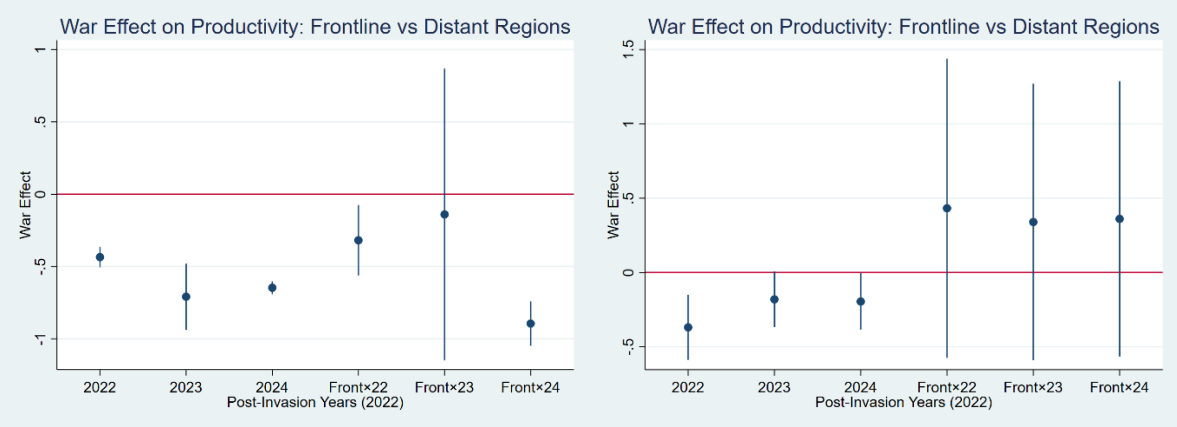
Figure 8. Annual War Effects for Firms without Bank Loans vs. with Bank Loans

a) without Bank Loans **b) with Bank Loans**

Employment



Labor Productivity



Wages