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REFUGEES AND ENTREPRENEURSHIP: EVIDENCE FROM UKRAINIANS IN POLAND

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ABSTRACT

Refugees and entrepreneurship: Evidence from Ukrainians in Poland

We examine business creation by Ukrainian refugees in Poland following the Russian invasion of Ukraine. Using registry data, we show that Ukrainians started 38,833 firms in 2022-23, accounting for 7% of all new registrations in Poland. We link this entrepreneurship to refugees in two ways. First, our survey shows that 58% of post-invasion Ukrainian founders registered as refugees. Second, cross-county regressions show that a 10% increase in adult male Ukrainian refugees is associated with a 2.71% increase in Ukrainian firm registrations. We then show that new Ukrainian businesses stimulate rather than crowd out Polish entrepreneurship. Using a shift-share strategy based on refugee shocks and Ukrainians' comparative advantage, we find that a 10% increase in Ukrainian registrations led to 2.31% more Polish firms. Survey evidence suggests two mechanisms: emulation, with 59% of Ukrainian owners reporting Polish entrepreneurs starting similar firms, and supply-chain linkages, with 88% of Ukrainian firms engaged in local business-to-business transactions.

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KEYWORDS: migration, firms, multiplier

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1 Introduction

A growing body of research shows that migrants play a disproportionate role in entrepreneurship, a key driver of job creation and productivity growth (Decker et al., 2014). Immigrants start businesses at higher rates than the native-born (Pekkala Kerr and Kerr, 2020; Chodavadia et al., 2024; Fairlie and Lofstrom, 2015; Gu, 2023). Their firms create more jobs (Azoulay et al., 2022; Jin et al., 2025) and are more innovative and productive (Lee et al., 2023). Yet there is doubt about whether these patterns are specific to the US (Green et al., 2023), and whether they extend to refugees (Desai et al., 2021; Bahar et al., 2022; Newman et al., 2024). What's more, an open question is whether migrant entrepreneurship crowds out native entrepreneurship (Fairlie and Meyer, 2003; Ghimire, 2021) or potentially encourages it through exposure (Wallskog, 2025; Giannetti and Simonov, 2009; Guiso et al., 2021; Galambos and Amatori, 2016). As Fairlie and Lofstrom (2015) noted, the contributions of migrant entrepreneurs need to be viewed "through the lens of crowd out".

We study these questions in the context of Ukrainian refugees in Poland. Russia's full-scale invasion of Ukraine in 2022 displaced more than six million Ukrainians, with Poland hosting around one million refugees (UNHCR, 2023a). Our analysis focuses on the business creation consequences of this large inflow.

Using business registry data, we first show that in 2022 alone, Ukrainian owners established 4,458 private limited companies and 10,954 sole proprietorships, accounting for 5% of all firm registrations in Poland. Second, using our original survey of Ukrainian entrepreneurs, we find that 58% of these post-invasion Ukrainian business founders arrived in Poland as refugees fleeing the war. This implies that more than 0.9 firms were created per 100 adult Ukrainian refugees in 2022, compared to 0.7 firms per 100 other adults, suggesting that Ukrainian refugees are more entrepreneurial than others in Poland overall. Our survey also reveals that a large share of Ukrainian entrepreneurs transferred their businesses from Ukraine, a finding confirmed by looking

up entrepreneurs' names in the Ukrainian business registry. We then combine business registry data with refugee settlement data across 380 Polish counties to further assess the link between refugees and entrepreneurship. We confirm that refugees are linked to business creation: a 10% increase in adult male Ukrainian refugees is associated with a 2.7% increase in Ukrainian business registrations in 2022, above what would have been predicted by prior economic trends and historical migration patterns.

We then examine whether refugee entrepreneurship crowds in or crowds out Polish entrepreneurship. To identify this causal impact, we use data across counties and sectors and include two-way fixed effects. We also use a shift-share instrumental variable (IV) strategy that interacts the geographically uneven refugee shocks with pre-invasion Ukrainian businesses' industry shares. This approach exploits the variation in business entry driven by the comparative advantage of refugees across industries, while netting out local demand shocks. The IV estimates reveal a positive multiplier. Rather than displacing Polish entrepreneurs, the influx of Ukrainian businesses stimulated additional firm creation by the native-born. We find that a 10% increase in Ukrainian-owned businesses generates 2.3% additional Polish firms in 2022. This multiplier effect is both statistically significant and economically meaningful. It indicates that refugee entrepreneurs encouraged host-county entrepreneurs to start businesses, instead of simply competing with them. In robustness checks, we show that our results hold for both 2022 and 2023, whether we look at all firms registered, including sole proprietorships, or only at incorporated partnerships, whether we use functional forms in logarithm, inverse hyperbolic sine, or in levels, or when we drop the 10 biggest counties.

Using our survey, we look into the potential mechanisms of this multiplier effect. We find that 59% of Ukrainian owners say Polish entrepreneurs started firms similar to theirs, in line with a creative emulation effect within sector. Another possibility is that Polish entrepreneurs start businesses that complement new Ukrainians firms in upstream and downstream sectors at the local level. Our survey again suggests that this might be a possibility. Among Ukrainian business owners, 88% say their firms

supply goods or services to other firms locally, and 62% of firms buy goods or services from other firms locally. We then look into the presence of a multiplier effects in upstream or downstream sectors using Poland's input-output matrix and find evidence suggestive of new Polish firms having emerged to connect with new Ukrainian firms both in upstream and downstream sectors.

By focusing on the multiplier effect of refugee entrepreneurship, our paper adds to the literature on the effects of migrants on entrepreneurship, where the effect of immigration on business creation may come from various other channels such as the supply of labor or demand for products. Olney (2013), Mahajan (2024), Duleep et al. (2021), Zavodny (2023) and Tareque et al. (2024) for example find that immigration has a positive impact on business creation across US metro areas (or States), while Unel (2024) suggests it reduces self-employment among white Americans. Jahn and Steinhardt (2023) showed that ethnic German migrants into Germany in the 1990s increased business creation, while Bosch (2025) similarly finds that immigrants increased native-born entrepreneurship across Spain's provinces and industries. When it comes to refugees, Altındağ et al. (2020) and Akgündüz et al. (2018) find that Syrian refugee arrivals led to foreign-owned firms entry across provinces in Turkey. Hessami et al. (2024) look at the effect of asylum seeker intakes across German districts from 2007 to 2021, and find that 10 extra asylum seekers per 1,000 inhabitants leads to 0.7 new businesses per 1,000 inhabitants, yet these businesses are mainly registered by Germans and not asylum seekers, possibly capturing labor-supply effects. We contribute to this literature by identifying the specific multiplier effect that may arise from refugee entrepreneurship.

Our paper also contributes to the literature on the economic effects of large refugee waves, which most often focuses on labor-market effects. For example, Card (1990), as well as Clemens and Hunt (2019) and Peri and Yasenov (2019) more recently, showed that the large inflow of Cubans from the Mariel Boatlift in Miami in 1980 had no effect on wages or jobs. Friedberg (2001) similarly showed that the mass migration of

Russians to Israel around the fall of the Soviet Union had no impact on the labor market outcomes of the native-born. Hunt (1992) and Edo (2020) on the other hand found that around 600,000 repatriates from Algeria to France in 1962 caused the wages of the native-born to drop.[1] While the evidence points towards large refugee waves having little effects on labor markets in general, focusing solely on jobs and wages might not allow us to fully understand the economic effects of refugees, as refugees' economic contribution might also come from their business activities. Our paper contributes to this literature by documenting the business creation effect of a large refugee wave.

The remainder of the paper is organized as follows. Section 2 covers the background; Section 3, the data; Section 4, the empirical strategy; and Section 5, the results. Section 6 concludes.

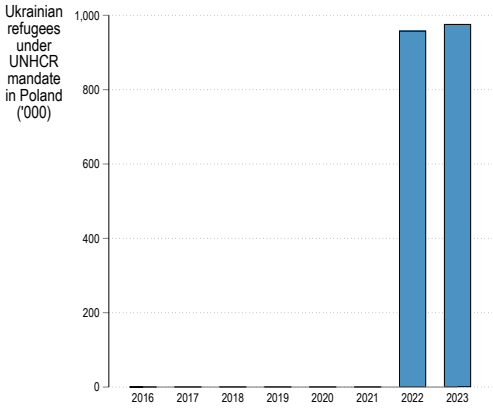
2 Background

The full-scale Russian invasion of Ukraine on 24 February 2022 led to a large sudden outflow of Ukrainian refugees. According to the UNHCR, out of an estimated 5.7 million Ukrainian refugees globally, 5.1 million were in Europe, and around 1 million in Poland. These numbers remained stable from 2022 through 2025. According to UN population projections, this inflow substantially increased Poland's population of 38 million (Figure 1).

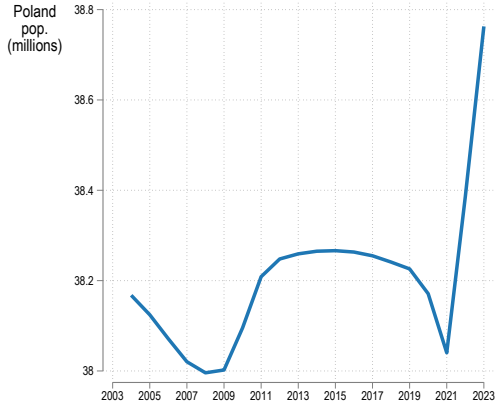
[1] Recent studies have also examined the labor-market effects of the 2022 Ukrainian refugee inflows. We discuss these in Section 2.

Figure 1: The large inflow of Ukrainian refugees in Poland

(a) UNHCR refugee data



(b) UN population projections



Source: UNHCR Operational Data Portal (https://data.unhcr.org/en/situations/ukraine) and UN WPP (https://population.un.org/wpp/).

This refugee wave is unique in at least two ways. First, it prompted an immediate and extensive grassroots effort to aid and welcome refugees. Volunteers mobilized on an unprecedented scale, providing housing, food, clothing, and financial assistance. Thousands of private vehicles transported refugees from the border, and Polish families hosted 1.6 million refugees, many of whom later moved to Germany (McMahon, 2023).[2] A report from the Polish Economic Institute indicates that 77% of adult Polish citizens contributed to the relief efforts in some capacity (Baszczak et al., 2022). This widespread support led to a distribution of refugees across Poland's 380 counties, roughly proportional to population. We explore further the locational determinants of refugees in Appendix B.

Second, unlike Syrians in Turkey or Venezuelans in Colombia, Ukrainians in Poland were granted access to almost all social benefits and public services on a par with Polish citizens upon arrival in Poland, and across the European Union (EU). On 12 March 2022 - only 16 days after the Russian invasion - Poland enacted a special law

[2]Private hosting of Ukrainian refugees was also common in Germany, and Herpell et al. (2025) suggest it led to better psychological integration but with no effects on linguistic, economic or political integration.

allowing refugees from Ukraine to apply for a newly established legal status.[3] It was initially valid for 18 months after their arrival, but successive law amendments have extended it, and it remains valid at the time of writing in 2025. This status granted refugees access to Polish social benefits, the right to work legally, access to the public education and healthcare systems, and set up businesses under the same conditions as the native-born.

The influx of Ukrainian refugees has had notable economic impacts on Poland. Pogarska et al. (2023) observed that the refugee inflow temporarily increased retail trade and private consumption. A quantitative model by UNHCR and Deloitte (2024) suggest that Ukrainian refugees contributed between 0.7% and 1.1% to Poland's GDP in 2023 through their roles as workers, entrepreneurs, consumers, and taxpayers. Similarly, Caliendo et al. (2023) present a model showing that the labor supply shock caused by Ukrainian refugees may have contributed to an increase in real GDP across Europe. Gromadzki and Lewandowski (2023) provide suggestive evidence that the refugee inflow did not affect labor market outcomes of natives or other migrants. This could be due to Poland's record-low unemployment rate of 3.4% in 2021. The strong Polish labor market contributed to a high employment rate among refugees, reaching 55-65% in 2022-2023 (Górny and Kaczmarczyk, 2023; Dudek et al., 2023), above rates recorded in Germany or Austria (Brücker et al., 2023; Kosyakova et al., 2024).[4] A report by Poland's National Development Bank (Departament Badań i Analiz, 2025) suggests refugees' net fiscal contribution in 2024 was positive, paying $4 billion in taxes and social security, far exceeding the public assistance they received.

These positive economic effects may partially explain why, contrary to experiences in other contexts, the economic impact of refugees in Poland is perceived as benign.

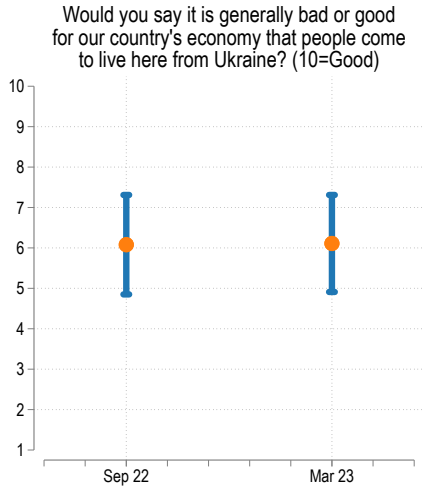
[3] *Ustawa z dnia 12 marca 2022 r. o pomocy obywatelom Ukrainy w związku z konfliktem zbrojnym na terytorium tego państwa.*

[4] Postepska and Voloshyna (2025) found no effect of Ukrainian refugees on natives' employment, unemployment, or inactivity rates in Czechia, and this across gender, education, and industry groups. Hainmueller et al. (2025) show that a fast-track employment program for Ukrainian refugees in Germany greatly improved labor-market outcomes.

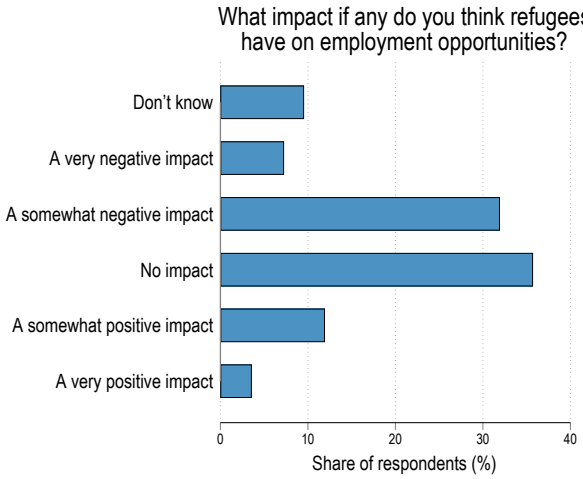
Halm et al. (2023) conducted two surveys in September 2022 and March 2023, finding that respondents considered the influx of Ukrainian refugees to be generally beneficial for the Polish economy (Panel (a) of Figure 2). Similarly, the EBRD Life in Transition Survey (2022-2023) revealed that more respondents believed refugees had either a positive or neutral impact on employment opportunities than those who perceived a negative impact (Panel (b) of Figure 2).

Figure 2: Perceptions of the economic impact of Ukrainian refugees in Poland

(a) Halm et al. (2023) (N=4,243)



(b) LiTS IV (N=1,005)



Source: Halm et al. (2023) and European Bank for Reconstruction and Development's Life in Transition Survey IV (2022-23).

Anecdotal evidence suggests that Ukrainian refugees may have impacted the Polish economy through business creation. Bloomberg (2023) documents the rapid relocation of Ukrainian businesses to Poland following the invasion, while The Economist (2023) writes that Ukrainian refugee entrepreneurs are transforming Poland's business landscape.[5] A report by Dębkowska et al. (2022) corroborates this trend, noting an in-

[5]The Economist (2023) gives a few examples of Ukrainian businesses: A co-working space for beauticians and hairdressers in Warsaw, Kapsula, a marketplace for fashion designers, Ukraine's biggest private postal service, NOVA, with branches in 21 Polish cities, and Warsaw's first Crimean Tatar restaurant. Other examples include Lviv Croissants, a bakery chain which at the time of writing in 2025 has 11 locations across Poland, and Chornomorka, a Ukrainian restaurant chain specializing in fish and seafood.

crease in Ukrainian business registrations in Poland after the Russian invasion. In the next section we describe the data we use to investigate this wave of business creation, link it to refugees, and estimate its multiplier effects on Polish entrepreneurship.

3 Data and descriptive evidence

3.1 Businesses

Our main sources of data on business creation are the National Court Register (Krajowy Rejestr Sądowy, KRS), which was compiled and provided by rejestr.io, and the Central Register and Information on Business Activity (Centralna Ewidencja i Informacja o Działalności Gospodarczej, CEIDG), which is publicly available. Together, these registries cover the universe of business creation in Poland.

Registering a business in Poland is a straightforward and low-cost process, with most steps available online. Both Polish citizens and foreign nationals, including Ukrainians, can register a sole proprietorship or a limited liability company through government online portals. A sole proprietorship can be registered free of charge via biznes.gov.pl. and the process only requires a PESEL identification number and a Trusted Profile, both of which can be obtained during a single visit to a municipal office.[6] A limited liability company can be created through the S24 system, with a low capital requirement (5,000 PLN, $\approx$ 1,360 USD) and minimal fees (350 PLN plus a tax of 0.5% of the starting capital). Processing times are short—typically 1-7 days when documents are complete. While Poland's e-government infrastructure makes setting up a business highly accessible, all official documents and online systems are in Polish. In 2022, a dedicated website (biznes.gov.pl/Ukraina) and an accompanying hotline were launched to provide Ukrainian entrepreneurs with all the necessary information

[6] A Trusted Profile is a free method of confirming a citizen's identity in public administration systems that also allows users to create an electronic signature that is as effective as a handwritten signature.

and support.

The KRS registry covers what we refer to as Inc. firms, i.e. private limited companies, as well as joint-stock companies, registered partnerships, and limited partnerships. To get a complete picture of business creation, we also use data on sole proprietorships from CEIDG.[7] Crucially, the registries include information on the citizenship of firm owners, allowing us to identify firms created by Ukrainian nationals. Specifically, we classify as Ukrainian any firm with at least one Ukrainian owner, and as Polish any firm with at least one Polish owner.[8]

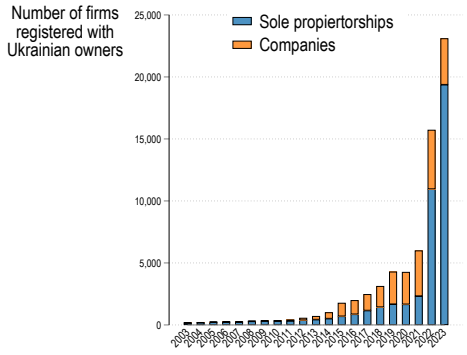
Figure 3 illustrates the trend in firm registrations by Ukrainian owners from 2014 onward. Following the Russian annexation of Crimea in 2014, registrations increased steadily, possibly reflecting the decline in self-employment and small and medium firm activity in Ukraine (Audretsch et al., 2023). Although the number of registrations fell below trend in 2020 due to the COVID-19 pandemic, a sharp rise occurred in 2022, likely driven by the Russian invasion and the subsequent refugee influx.

[7]We focus on incorporated firms in robustness checks as sole proprietorships may also represent outsourced workers rather than true entrepreneurship, especially since sole proprietors in Poland enjoy preferential taxation. Since 2004, business owners in Poland face a flat rate income tax rather than progressive income tax applied to employees. Individuals who establish new firms are also temporarily exempted from social security contributions. Klejdysz and Zawisza (2024) show that preferential taxation increased transitions to long-term self-employment without dependent workers, especially in high-skilled service industries.

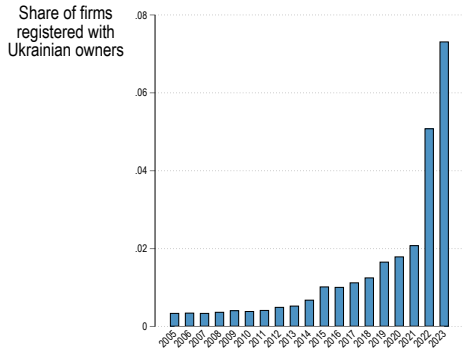
[8]Incorporated firms jointly owned by Polish and Ukrainian nationals represent a small share of Ukrainian firms (10.7%); we classify these as both Ukrainian- and Polish-owned.

Figure 3: Firm registrations with Ukrainian owners in Poland

(a) Firms with Ukrainian owners



(b) % of registrations



Source: National Court Register (KRS) and Central Register and Information on Business Activity (CEIDG).

In 2022, Ukrainian owners registered 4,458 private limited companies and 10,954 sole proprietorships, collectively accounting for over 5% of all firm registrations in 2022. In 2023, Ukrainian firms accounted for more than 7% of all registrations. Table A.1 presents the distribution of all firms across NACE Rev. 2 industries. If we look at incorporated firms only, firms with Ukrainian owners represented 14% of all registrations in Transportation and Storage, 12% in Administrative and Support Services (half being employment placement and temporary employment agencies), and 10% in Wholesale and Retail, including motor vehicle repair.

The business registry does not include information on whether the Ukrainian owners are refugees however. In order to get that information, we designed and fielded an online survey of Ukrainian entrepreneurs, and we also examined the links between refugees and firm creation across counties. More on this in the next sub sections.

3.2 Refugees

To measure refugee inflows and understand their links with Ukrainian entrepreneurship, we use data on refugees from the Universal Electronic System for Registration of

the Population (PESEL). Upon arrival, refugees from Ukraine could obtain legal status simply by registering in PESEL, which was free and could be arranged in any municipal office. Moreover, Poland created a dedicated sub-registry (PESEL UKR) which provides highly accurate information on the location of Ukrainian refugees' across the country.

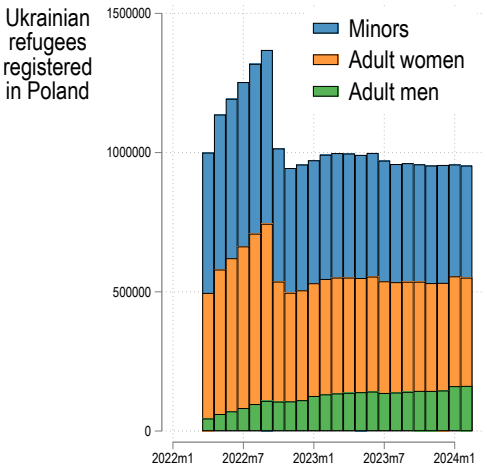
The refugee numbers are consistent with UNHCR data, and the PESEL records allow us to measure refugee stocks by age and gender across Polish counties (see Figure 4). Refugees settled across all counties, as local engagement and support attracted them to every corner of the country.[9] The refugee population consisted predominantly of women and children, as most men were required to remain in Ukraine to support the defense effort. Exceptions were made for certain groups, including students, fathers of more than two children, and selected professionals such as scientists and teachers.[10] Ukrainian refugees also appear to have been positively selected in terms of education, a pattern commonly observed among refugee populations (Aksoy and Poutvaara, 2021). According to UNHCR and Deloitte (2024), 56% of refugees held higher education degrees, compared with 30% among Poles (Eurostat UFS 2002) and 34% among Ukrainians living in Ukraine before the war (Ukrstat UFS 2020).

[9] We examine the locational determinants of refugee settlement in Appendix B.

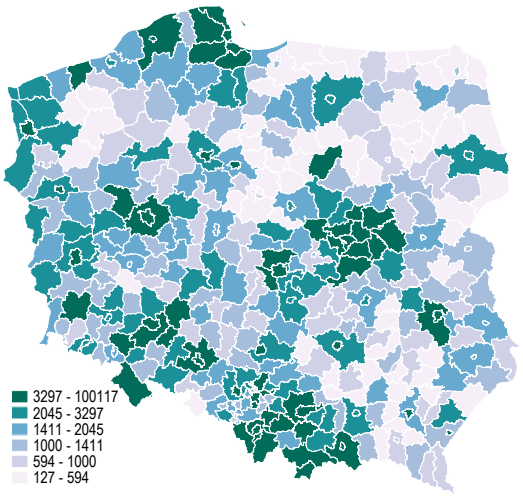
[10] A detailed list of these exemptions is provided by the ES&Partners law firm (https://www.es.partners/en/who-is-exempt-from-mobilization-in-wartime-in-2025).

Figure 4: Ukrainian refugees in Poland

(a) Monthly stocks



(b) Geographic distribution - Dec 2022



Notes: The total refugee stock reached 1 million as early as March 2022. A decline in numbers in June 2022 is due to the implementation of an automatic mechanism revoking foreigner status after 30 days of registered departure from Poland. Subsequently, the refugee population stabilized at around 1 million and remains at that level at the time of writing in 2025. Source: PESEL.

We also use data from Statistics Poland on county population and from the Ministry of Family, Labour, and Social Policy for an estimate of the distribution of around 1.6 million Ukrainians across Poland in 2021, before the refugee influx.[11]

Importantly, the registration of non-refugee Ukrainian migrants in Poland effectively ceased in February 2022, coinciding with the onset of the conflict. According to data from the Ministry of Labour and Social Policy, the number of work permits and declarations (the main pre-war channels for Ukrainian migration) issued between

[11]This estimate is based on Ukrainians holding *Zezwolenia* (work permits), *Praca Sezonowa* (seasonal work permits), and *Oświadczenia* (Declarations), which are statements of intent to employ available to citizens of Armenia, Belarus, Georgia, Moldova, and Ukraine. Ukrainian economic migration to Poland expanded rapidly in the late 2010s, driven by strong labor demand and successive rounds of labor-market liberalization by Polish governments. This migration was predominantly circular, involved mostly men, and featured high employment rates. Because many migrants were temporary or seasonal, the exact number of Ukrainians residing in Poland before the 2022 invasion is uncertain. The 2021 Polish census recorded 916,000 temporary Ukrainian migrants, a Polish government COVID-19 report estimated 1.35 million Ukrainians in 2019, and Strzelecki et al. (2022) suggest up to 2 million in 2018. While estimates vary across sources, they point to the Ukrainian population in Poland roughly doubling with the refugee inflow after 2022.

April and December 2022 was only 10% of the number issued over the same period in 2021. Summary statistics for refugees and businesses across counties in 2022–2023 are presented in Table 1.

Table 1: Summary statistics across 380 counties

	Obs.	Mean	Std. Dev.	Min.	25%	75%	Max.
All Ukrainian firm registrations in 2022	380	27.2	163.0	0	2	10.5	2786
Inc. Ukrainian firm registrations in 2022	380	12.5	97.4	0	0	3	1771
All Ukrainian firm registrations in 2023	380	31.3	172.9	0	2	13	2931
Inc. Ukrainian firm registrations in 2023	380	9.79	79.1	0	0	2	1454
Avg Ukrainian firm registrations 2015-2021	380	8.15	42.7	0	0.93	3.57	704.6
Avg total firm registrations 2015-2021	380	533.9	1432.1	59.4	186.8	466.3	24604.6
Ukrainian refugees registered as of Dec 2022	380	2516.8	6118.4	127	813	2474.5	100117
Men 18+ Ukrainian refugees registered as of Dec 2022	380	313.2	1018.4	8	79	259.5	16347
Women 18+ Ukrainian refugees registered as of Dec 2022	380	1122.4	2826.8	52	329.5	1090	45999
Population in 2021	380	99757.1	123860.0	18992	52502	109143.5	1863056
Ukrainian work permits in 2021	380	4257.0	9076.0	22	751.5	3775.5	89871

Source: KRS, CEIDG, PESEL, Statistics Poland, and Ministry of Family, Labour, and Social Policy.

3.3 Survey of Ukrainian entrepreneurs in Poland

To estimate the share of Ukrainian business owners who are refugees, we designed and implemented an online survey targeting all Ukrainian nationals who registered a business in 2022 or later. The questionnaire included modules on respondent demographics, firm characteristics, business background and motivations, networks and support structures, financing and challenges, and outlook and future plans (see Appendix J for the full survey instrument). Crucially, the survey asked whether respondents had registered as refugees under the PESEL system, and we also gathered information on the extent of their business interactions with Polish firms.

Among 149 respondents, 110 had registered their business after January 2022, and among these, 64 had registered as refugees via the PESEL system.[12] This suggests that refugees account for approximately 58% of the surge in Ukrainian-owned business creation since 2022.[13] Other Ukrainian new business owners may have been living in

[12]Given the limited number of respondents, the survey should not be considered nationally representative.

[13]This share is in line with data form the social security system (ZUS) on self-employment, cited in

Poland before the invasion, or may live in Ukraine or elsewhere while owning a business in Poland (we look into this possibility in Appendix D).

Using this estimate of refugee entrepreneurship, we can check whether refugees are more entrepreneurial than the native-born in our setting. To do so, we compute the refugee entrepreneurship rate by attributing 58% of Ukrainian firms registered in 2022 to the adult refugee population. We compare this to the entrepreneurship rate of non-refugees. To do so we take all business registrations in 2022, minus those attributed to Ukrainian refugees, over the adult population in 2021, before the refugee wave of 2022.[14]

Overall, we find that there are more than 0.9 firms per 100 adult Ukrainian refugees, compared to 0.7 firms per 100 other adults (Figure 5). This suggests that Ukrainian refugees are, on average, more entrepreneurial than others in Poland. Comparing rates across counties, we find that this overall difference is driven by counties where Ukrainian refugees exhibit particularly high levels of entrepreneurial activity.[15]

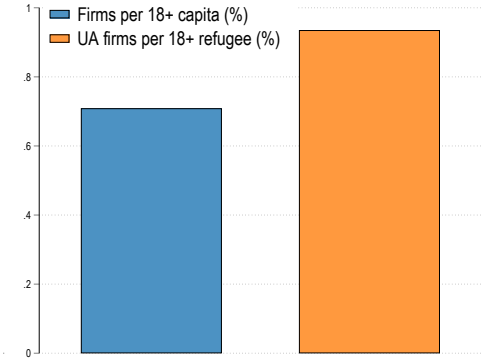
Deloitte (2025), which suggests that refugees account for 14.8K of the 28.8K net increase in Ukrainian self-employed during 2022-2024.

[14]This entrepreneurship rate is not strictly that of the native-born population, as it includes that of non-Ukrainian migrants and non-refugee Ukrainians. It is thus likely to be an overestimate of the Polish native-born entrepreneurship rate.

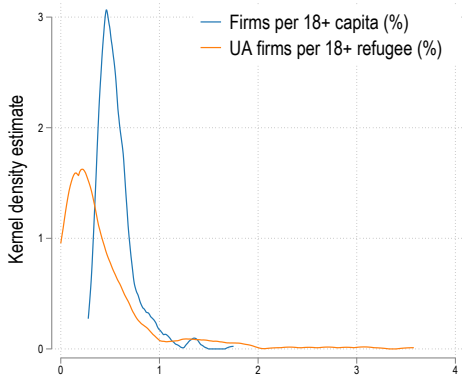
[15]This higher firm registration rate among Ukrainian refugees may reflect their automatic access to formal status in Poland, a privilege not granted to refugees in many other countries. Bahar et al. (2022) examine the impact of a 2018 Colombian policy granting resident visas to Venezuelan migrants, using administrative data linked to formal business registers. They show that visa recipients significantly increased their entrepreneurial activity but only reached parity with native Colombians after four years.

Figure 5: Entrepreneurship in Poland in 2022: Ukrainian refugees vs others

(a) Overall



(b) Across 380 counties



Notes: Based on our survey, we attribute 58% of Ukrainian-owned firms to refugees. All other firms are attributed to others. We focus on adult populations: 67% of Ukrainian refugees are 18+ (UNHCR), and 82% of Polish pop is 18+. Source: PESEL, KRS, CEIDG, and (Statistics Poland).

Our survey suggests that most Ukrainian entrepreneurs are opportunity-driven rather than necessity-driven. Over two-thirds started their business for proactive reasons – for example, 70% wanted independence (to "be their own boss") and around 40% spotted a market opportunity to fill. In contrast, only about one-fourth cited the lack of a salaried job in Poland as a key motive. Also, half of the entrepreneurs had an existing business in Ukraine instead of starting from scratch.[16] The vast majority of these entrepreneurs plan intend to remain in Poland and continue expanding their business after the war. Only a small minority (8%) expects to return to Ukraine. We can compare our survey responses to that by Dębkowska et al. (2022), who fielded a similar survey of Ukrainian entrepreneurs (n=80) (yet with no information collected on refugee status nor on business interactions). The results are summed up in Table 2 and suggest similar findings. Few start businesses because they can't find a job, many sought to continue a business they had back in Ukraine, and most plan to stay

[16]We also looked up the names of the Ukrainian firm owners in Poland in the Ukrainian business registry and found ≈ 25% of them, allowing for small differences in first and last names, suggesting a substantial share owned a registered business back in Ukraine (see Figure C.5). This provides a lower-bound to the estimate from the survey.

in Poland in the long run.

Table 2: Comparing surveys of Ukrainian entrepreneurs in Poland

	Polish Economic Institute (n=80)	**Our Survey (n=110)**
Started firm due to lack of jobs	16%	25%
Sought to continue/owned a business back in Ukraine	50%	50%
Plan to stay in Poland long-term	66%	66%
Intend to return to Ukraine after the war	4%	8%

Source: Dębkowska et al. (2022) and our own survey.

We discuss other findings of our survey in the results section. In the next section, we describe the empirical strategy to examine the links between Ukrainian refugees and Ukrainian business creation and their potential effects on Polish entrepreneurship.

4 Empirical strategy

Our aim here is twofold. First, we seek to further establish that Ukrainian refugee entrepreneurs are behind the wave of Ukrainian business creation in Poland. While our survey suggests that a large share of new Ukrainian business owners are refugees, it is based on a small and possibly non-representative sample. We therefore also examine the relationship between Ukrainian refugees and business formation across counties, and compare this to the pattern among other potential Ukrainian business owners, i.e. those who had been in Poland before the war.

Second, we want to assess whether the wave of Ukrainian business creation crowded out, or crowded in, entrepreneurship among the native-born. As we detail below, our strategy to identify the causal relationship from Ukrainian to Polish-owned business creation exploits refugee shocks and a measure of the comparative advantage of Ukrainian entrepreneurs.

4.1 Refugees and business creation

To estimate the relationship between refugee inflows in 2022 and firm registrations by Ukrainian owners in 2022, we use the following specification across 380 counties:

$$\begin{aligned}(\text{UA firm registrations in 2022})_i = \beta_0 + \beta_1(\text{UA refugees in 2022})_i \\ +\beta_2(\text{Pop in 2021})_i + \beta_3(\text{Other Controls})_i + \varepsilon_i\end{aligned} \tag{1}$$

The dependent variable is the total number of firms registered by Ukrainian owners in county i in 2022 (or in 2023, in separate regressions). The independent variable of interest is the number of Ukrainian refugees in county i as of 31 December 2022 (using refugee stock data from any point after August 2022 yields similar results). We examine the effect of total refugees as well as that of adult male or female refugees in alternative specifications, and we consider functional forms in logs (ln), inverse hyperbolic sine (asinh), levels and shares.

Our aim here is to check whether the data across counties is in line with Ukrainian refugees themselves being the ones starting these businesses. We do not aim to estimate the causal effect of refugees on firm creation, which would operate through various labor-supply and product-demand channels. Rather, we aim to show that refugees are associated with Ukrainian business creation above and beyond what would have been expected based on prior economic trends and pre-existing Ukrainian networks. To this end, we include a set of control variables. First, using 2021 work permit data, we control for the size of pre-existing Ukrainian communities, which may themselves include new business owners, and may also have influenced refugee settlement. This "horse-race" control allows us to assess whether Ukrainian new business owners are more likely to be refugees or pre-war residents of Poland.

We also control for counties' 2021 population, as larger counties tend to attract more refugees and businesses. To capture underlying economic trends and the local business environment, we include the average number of all firms created in each county

between 2015 and 2021. Alternatively, we control for the average number of Ukrainian-owned firms created during the same period to account for pre-existing trends specific to Ukrainian entrepreneurs.[17] Summary statistics on the variables used in this exercise are in Table 1.

4.2 Identifying a multiplier effect

As a second step, we examine the effect of new Ukrainian businesses on firm creation by Polish entrepreneurs in 2022, (and in 2023, in separate regressions). Our analysis is conducted across counties (i) and sectors (k), allowing for a *shift-share* identification strategy with two-way fixed effects that control for location- and sector-specific factors. This approach helps isolate the multiplier effect from other channels such as the local demand generated by refugees that may drive business creation by both Ukrainian and Polish entrepreneurs across counties.

We instrument the number of Ukrainian firms in 2022 (or 2023) with the interaction between the inflow of adult male refugees into county i in 2022 (the share) and the share of Ukrainian firms registered in sector k in Poland during 2015–2021 (the shift). The intuition is that county-level refugee shocks generated more Ukrainian businesses in sectors in which previous Ukrainian owners have a higher propensity to operate, reflecting the comparative advantage of Ukrainians in Poland.

We focus on adult male refugees rather than total refugee inflows, as they are more directly linked to business creation, as detailed in Appendix C. Put differently, counties that received more adult male refugees experienced larger increases in Ukrainian-run firms in sectors where Ukrainians have had a higher tendency to start businesses. For instance, sectors such as construction which are traditionally Ukrainian-intensive saw

[17] These control variables are further justified by a LASSO analysis of the locational determinants of Ukrainian refugees, included in Appendix B, where we also consider measures of affinity with Ukraine such as historical ethnic Ukrainian communities, as well as measures of travel distance such as counties' distance from border checkpoints.

greater inflows of Ukrainian firms in high-refugee counties than sectors such as finance.

As an alternative instrumental variable (IV), we use the interaction between the inflow of adult male refugees into county i in 2022 (the share) and the share of self-employed adult male refugees across sectors k back in Ukraine, based on data from a UNHCR survey. The drawback of this alternative IV is that it varies only across 20 major sectors, whereas the IV based on Ukrainian businesses in Poland varies across 88 sectors. This sectoral variation is summarized in Figure 6.

Our 2SLS model takes the following specification:

First stage:

$$\begin{aligned}(\text{UA firm registered in 2022 or 2023})_{ik} = \alpha_i + \gamma k + \beta_1(\text{Avg PL registrations 2015-21})_{ik} \\ +\beta_2(\text{UA 18+ men refugees in 2022})_i \times (\%\ \text{UA firm registered in 2015-2021}_k) + \varepsilon_{ik}\end{aligned} \tag{2}$$

where α_i and γk are county and sector fixed effects, and our instrument is the interaction of the inflow of adult men refugees in county (i) with the average of firm registered by Ukrainian owners in sector k over the previous 7 years, from 2015 to 2021. As per our second stage shown below, we control for local business dynamics using the yearly average of business registrations over 2015-2021 in county i to capture deviations from what would have been expected based on previous years of Polish business creation.

Second stage:

$$\begin{aligned}(\text{PL firm registrations in 2022 or 2023})_{ik} = \alpha_i + \gamma k \\ +\beta_1(\text{UA firm } \widehat{\text{registered in}} \text{ 2022 or 2023})_{ik} + \beta_2(\text{Avg PL registrations 2015-21})_{ik} + \varepsilon_{ik}\end{aligned} \tag{3}$$

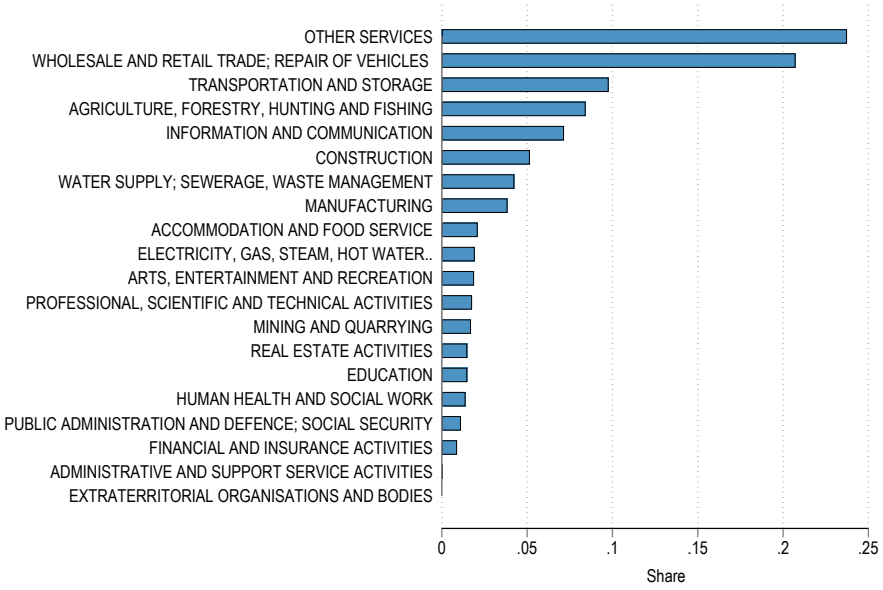
Note that on the left-hand side here we focus on net firm registrations, i.e. new firms net of firms that ceased activity, to take into account that new Ukrainian firms may both create and destroy firms locally. (When firms cease to exit, the date of

cessation is included in the registry.) We discuss the results in the next section.

Figure 6: Distribution of Ukrainian entrepreneurship across sectors before 2022

(a) Ukrainian-owned firms in Poland 2015-2021

(b) Self-employed adult men refugees before leaving Ukraine



Source: KRS, CEIDG, and the Poland - Multi-Sector Needs Assessment (MSNA) survey by UNHCR in Jul-Aug 2023.

5 Results

5.1 Business creation by Ukrainian owners

Our estimates for Equation 1 are in Tables 3 (total refugees), 4 (adult female refugees), and 5 (adult male refugees). In all tables, we show results using different specifications, i.e. using logarithmic (ln) and inverse hyperbolic sine (asinh) transformations, as well as in levels and shares. These alternative functional forms have the advantage of including all 380 counties, including the 44 counties where no Ukrainians registered businesses in 2022. We show results using two separate set of control variables. While all regressions control for county population and Ukrainian networks, in odd columns we control for average total firm registrations during 2015-2021, while in even columns we control for average Ukrainian registrations. We include results for 2022 and 2023 in separate table panels. We also use separate panels for estimates using *All firms*, including Inc. firms and sole proprietorships, and when we focus on Inc. firms only.

We find a positive and significant relationship between refugees and all Ukrainian firm registrations, in line with refugees being behind a significant share of Ukrainian business registrations. This is the case in 2022 and 2023, and for both adult men and women refugees as well as total refugees. The coefficients for total refugees in the log specification for 2022 suggest that a 10% increase in refugees is associated with a 4.2% increase in Ukrainian firm registrations (Table 3, col. 2). The coefficient in levels (col. 6), suggests 0.6 extra registrations for every 100 extra refugees, or **0.036** extra Ukrainian firms per adult men refugee (Table 5, col. 6). Multiplying this number by the total number of adult men refugees would suggest adult men refugees account for $\approx$ **50%** of Ukrainian firms in 2022, in line with our survey data. When we take shares, we find that a 1 percentage point increase in the refugee share of the county population is associated with a .42 percentage point increase in the Ukrainian share of local business registrations (col. 8).

When we focus on Inc. firms, we find only adult men refugees to be robustly associated with Ukrainian firm creation. In the second panel of Table 5, the coefficients for 2022 suggest a 10% increase in adult men refugees is associated with a 2.57% increase in Ukrainian registrations (col. 2), or that a 1 percentage point increase in the adult men refugee share of the county population is associated with a 4.77 percentage point increase in the Ukrainian share of local business registrations (col. 8). We investigate further the gender differences in Ukrainian refugee entrepreneurship in Appendix C.

Table 3: Refugees and Ukrainian firm creation in 2022 and 2023

	Dependent variable: Ukrainian firm registrations							
	ln		**asinh**		**levels**		**shares**	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
				All firms - 2022				
All refugees	0.410***	0.422***	0.494***	0.505***	0.009**	0.006***	0.769***	0.424***
	(0.108)	(0.110)	(0.111)	(0.099)	(0.004)	(0.002)	(0.207)	(0.123)
N	336	299	380	380	380	380	380	380
R-sq	0.74	0.80	0.73	0.77	0.98	0.99	0.23	0.49
				Only Inc. firms - 2022				
All refugees	0.093	0.157	0.102	0.114	0.000	0.004	1.183***	0.391*
	(0.142)	(0.148)	(0.098)	(0.083)	(0.001)	(0.004)	(0.438)	(0.209)
N	215	203	380	380	380	380	380	380
R-sq	0.76	0.78	0.70	0.79	0.98	0.97	0.09	0.44
				All firms - 2023				
All refugees	0.314***	0.382***	0.400***	0.439***	0.010**	0.008***	0.903***	0.590***
	(0.100)	(0.114)	(0.110)	(0.106)	(0.004)	(0.002)	(0.196)	(0.142)
N	352	305	380	380	380	380	380	380
R-sq	0.77	0.77	0.74	0.76	0.98	0.99	0.31	0.48
				Only Inc. firms - 2023				
All refugees	0.055	0.138	-0.032	-0.023	-0.000	0.005	0.842**	0.216
	(0.132)	(0.121)	(0.090)	(0.067)	(0.000)	(0.003)	(0.386)	(0.151)
N	198	184	380	380	380	380	380	380
R-sq	0.74	0.82	0.69	0.78	0.99	0.96	0.07	0.39
Controls								
Average firms 2015-2021	Y		Y		Y			
Average UA firms 2015-2021		Y		Y		Y		Y
Population in 2021	Y	Y	Y	Y	Y	Y		
UA work permits in 2021	Y	Y	Y	Y	Y	Y	Y	Y

Notes: Estimates of the effect of Ukrainian refugees in 2022 on UA firm registrations in 2022 and 2023 using equation 1 across Polish counties. The table panels with all firms include sole proprietorships and private limited companies (Inc firms). In columns 7-8, refugees are measured as share of the county population in 2021, Ukrainian firms as a share of all new firms, UA work permits as a share of county population, and average UA firms 2015-2021 as a share of average firms 2015-2021. Robust standard errors in parenthesis. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$.

Table 4: Women 18+ refugees and Ukrainian firm creation in 2022 and 2023

	Dependent variable: Ukrainian firm registrations							
	ln		asinh		levels		shares	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	All firms - 2022							
Women 18+ refugees in 2022	0.395***	0.448***	0.469***	0.512***	0.020**	0.014***	1.499***	0.973***
	(0.106)	(0.110)	(0.107)	(0.097)	(0.010)	(0.004)	(0.349)	(0.262)
N	336	299	380	380	380	380	380	380
R-sq	0.74	0.80	0.73	0.77	0.98	0.99	0.20	0.49
	Only Inc. firms - 2022							
Women 18+ refugees in 2022	0.052	0.178	0.082	0.138*	0.000	0.008	2.080***	0.894**
	(0.135)	(0.147)	(0.094)	(0.082)	(0.003)	(0.008)	(0.597)	(0.426)
N	215	203	380	380	380	380	380	380
R-sq	0.76	0.78	0.70	0.79	0.98	0.97	0.07	0.44
	All firms - 2023							
Women 18+ refugees in 2022	0.304***	0.420***	0.384***	0.450***	0.022**	0.018***	1.870***	1.387***
	(0.097)	(0.111)	(0.107)	(0.104)	(0.008)	(0.005)	(0.386)	(0.313)
N	352	305	380	380	380	380	380	380
R-sq	0.77	0.78	0.74	0.76	0.98	0.99	0.30	0.49
	Only Inc. firms - 2023							
Women 18+ refugees in 2022	-0.001	0.161	-0.071	-0.017	-0.001	0.009	1.319***	0.380
	(0.123)	(0.122)	(0.086)	(0.068)	(0.001)	(0.007)	(0.497)	(0.316)
N	198	184	380	380	380	380	380	380
R-sq	0.74	0.82	0.69	0.78	0.99	0.96	0.05	0.39
Controls								
Average firms 2015-2021	Y		Y		Y			
Average UA firms 2015-2021		Y		Y		Y		Y
Population in 2021	Y	Y	Y	Y	Y	Y		
UA work permits in 2021	Y	Y	Y	Y	Y	Y	Y	Y

Notes: Estimates of the effect of adult women Ukrainian refugees in 2022 on UA firm registrations in 2022 and 2023 using equation 1 across Polish counties. The table panels with all firms include sole proprietorships and private limited companies (Inc firms). In columns 7-8, women refugees are measured as share of the county population in 2021, Ukrainian firms as a share of all new firms, UA work permits as a share of county population, and average UA firms 2015-2021 as a share of average firms 2015-2021. Robust standard errors in parenthesis. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$.

Table 5: Men 18+ refugees and Ukrainian firm creation in 2022 and 2023

	Dependent variable: Ukrainian firm registrations							
	ln		asinh		levels		shares	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
All firms - 2022								
Men 18+ refugees in 2022	0.597***	0.271***	0.620***	0.324***	0.086***	0.036*	8.544***	4.273***
	(0.105)	(0.085)	(0.103)	(0.079)	(0.011)	(0.021)	(1.099)	(0.847)
N	336	335	380	380	380	380	380	380
R-sq	0.71	0.82	0.71	0.82	0.99	0.99	0.34	0.49
Only Inc. firms - 2022								
Men 18+ refugees in 2022	0.226*	0.257*	0.219***	0.183***	0.013***	0.001	11.249***	4.767***
	(0.123)	(0.134)	(0.079)	(0.066)	(0.004)	(0.029)	(1.982)	(1.366)
N	215	203	380	380	380	380	380	380
R-sq	0.76	0.79	0.71	0.79	0.99	0.96	0.13	0.45
All firms - 2023								
Men 18+ refugees in 2022	0.423***	0.193**	0.442***	0.246***	0.085***	0.047*	9.823***	5.687***
	(0.096)	(0.086)	(0.104)	(0.090)	(0.011)	(0.028)	(1.136)	(1.054)
N	352	350	380	380	380	380	380	380
R-sq	0.73	0.80	0.72	0.79	0.99	0.99	0.42	0.54
Only Inc. firms - 2023								
Men 18+ refugees in 2022	0.211*	0.307***	0.070	0.033	0.003	0.004	8.308***	3.188***
	(0.113)	(0.113)	(0.074)	(0.057)	(0.002)	(0.028)	(1.652)	(1.185)
N	198	184	380	380	380	380	380	380
R-sq	0.74	0.82	0.69	0.78	0.99	0.95	0.10	0.40
Controls								
Average firms 2015-2021	Y		Y		Y			
Average UA firms 2015-2021		Y		Y		Y		Y
Population in 2021	Y	Y	Y	Y	Y	Y		
UA work permits in 2021	Y	Y	Y	Y	Y	Y	Y	Y

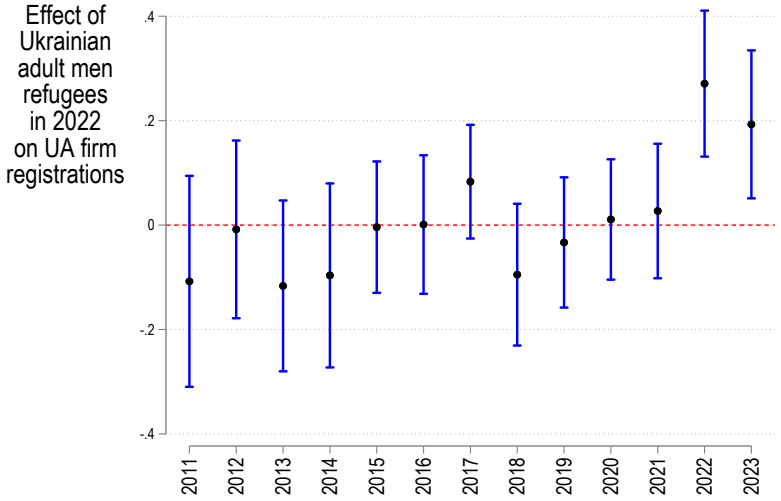
Notes: Estimates of the effect of adult men Ukrainian refugees in 2022 on UA firm registrations in 2022 and 2023 using equation 1 across Polish counties. The table panels with all firms include sole proprietorships and private limited companies (Inc firms). In columns 7-8, adult men refugees are measured as share of the county population in 2021, Ukrainian firms as a share of all new firms, UA work permits as a share of county population, and average UA firms 2015-2021 as a share of average firms 2015-2021. Taking the log of Ukrainian firm registrations as well as of control variables affects the sample sizes. Robust standard errors in parenthesis. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$.

In Figure 7, instead of focusing on the effect of adult men refugees in 2022 on Ukrainian business creation only in 2022 and 2023, we look at all years from 2011 to 2023. We show the results of estimating equation (1) year by year. The regressions for the years before 2022 can be thought of as placebos, as we do not expect refugees to have created businesses in the years before they arrived. We use the specification of column (2) in Table 5, controlling for population in 2021, Ukrainians in 2021, and average Ukrainian firm creation 2015-2021. The results confirm that adult male refugees in 2022 are correlated with Ukrainian firm creation only in 2022 and 2023, when they were indeed present. This confirms that this relationship is not driven by omitted

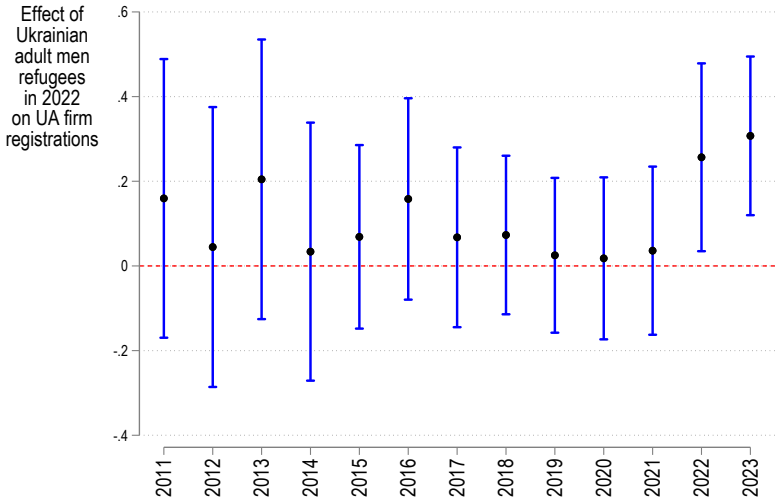
factors capturing pre-existing Ukrainian affinity at the county-level. This is the case whether we look at all firms or only Inc. firms. Overall, the results strongly suggest refugees themselves are behind business creation in 2022 and 2023.

Figure 7: Placebos: Are refugee stocks in 2022 associated with Ukrainian (UA) firm registrations before 2022?

(a) All firms



(b) Inc. firms



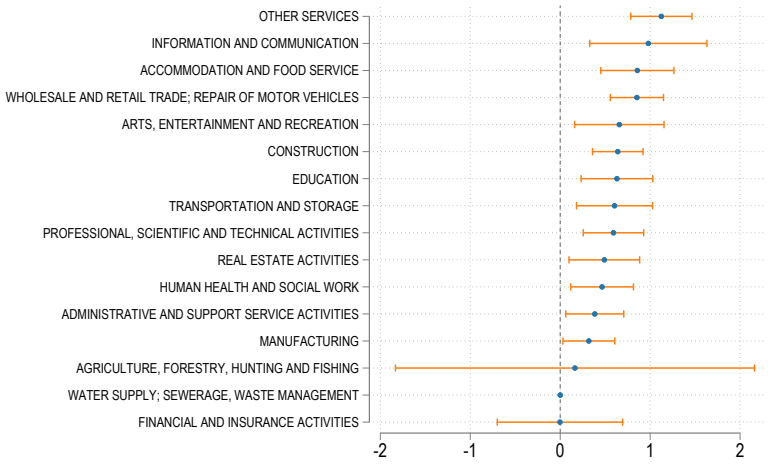
Notes: Estimates of the effect of Ukrainian adult men refugees in 2022 on UA firm registrations in different years from 2011 to 2023 year. The estimated equation is that in column (2) in Table 5, using logs and controlling for population in 2021, Ukrainians in 2021, and average UA firm creation 2015-2021.

We also estimate the effects by sector and find a stronger association between refugee inflows and firm creation in sectors such as transportation and storage, wholesale and retail trade, and construction, particularly when focusing on incorporated firms (panel (b) of Figure 8).[18] When we include sole proprietorships (panel (a)), we find large effects in information and communication, accommodation and food services, and other personal services, including computer and household repair, laundry and dry-cleaning, hairdressing and beauty treatments, and tattooing, as well as in wholesale and retail trade and arts and entertainment.

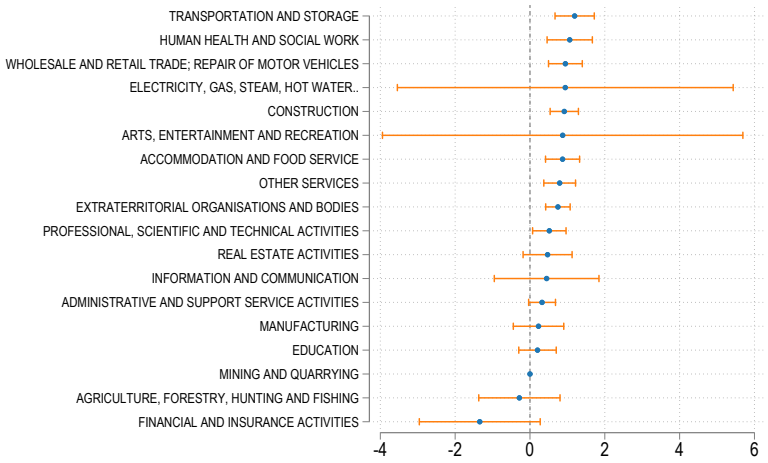
[18] Ukrainian-owned firms in Poland, particularly in the transportation sector, may also contribute to humanitarian operations in Ukraine and to the country's defense efforts (Czerska-Shaw and Dunin-Wąsowicz, 2024). These effects may amplify when the war ends and business with Ukraine resumes (Bahar et al., 2022).

Figure 8: In which sectors are refugees most associated with firm creation?

(a) All firms



(b) Inc. firms



Notes: Estimates of the effect of Ukrainian adult men refugees in 2022 on UA firm registrations in 2022 by sector. The estimated equation is that in col. 2 of Table 5, controlling for population in 2021, Ukrainians in 2021, and average UA firm creation 2015-2021.

The results thus suggest that refugees, and adult men refugees in particular, are behind a large chunk of Ukrainian business creation in 2022 and 2023. Who could the Ukrainian entrepreneurs in 2022 and 2023 be, if not refugees? One possibility is that they are Ukrainians who arrived in Poland before 2022 or who did not register as refugees. Yet, when we include Ukrainians on work visas in 2021 as a control variable,

we do not find it to be positively correlated with Ukrainian firm creation in 2022 or 2023. Another possibility is that Ukrainian owners reside outside Poland, and hence we can think of their businesses in Poland as foreign direct investment (FDI). We examine this further in Appendix D. We now turn to estimating the potential crowding-out effects of Ukrainian entrepreneurship.

5.2 Multiplier effect

Having established that Ukrainian refugees in Poland are associated with a large wave of new businesses, one question that may arise is how did these new firms affect business creation by Polish entrepreneurs. Did refugee entrepreneurship crowd out, or encourage, entrepreneurship by the native-born?

To address this question, we estimate the multiplier effect of new Ukrainian firms on Polish firm creation using a two-stage least squares model, as specified in Equations 3 and 2.

The results in Table 6 show both OLS and 2SLS estimates of the multiplier effect for all firms, using specifications in logs, asinh, and in levels (the first stage results and visual plots are included in Appendix E). Columns 1 and 4 are OLS estimates, columns 2 and 5 are 2SLS using (Men 18+ refugees in county $\times$ share of Ukrainian firms in sector in 2015-2021) as an IV, and columns 3 and 6 are 2SLS estimates using (Men 18+ refugees in county $\times$ share of self-employed adult men Ukrainian refugees in major sector in Ukraine before leaving) as an alternative IV. Columns 1-3 show results for 2022, and 4-6 for 2023. We find indications of a positive multiplier effect, statistically significant in 13 out of 18 specifications. In the log specification of col (2), the coefficient suggests that a 10% increase in Ukrainian registrations led to 2.31% more Polish firm registrations. In the two bottom panels we show results using specifications in levels as well as in inverse hyperbolic sine. This increases the number of observations to 33,440, as it includes all 380 counties and 88 sectors, even where there are no Ukrainian firms.

The results in levels for 2023 (col. (6)) suggest that 10 extra Ukrainian firms increase the number of Polish firms by 3.47.[19]

In Table 7, we focus on Inc. firms and find a positive and statistically significant multiplier effect in 16 out of our 18 specifications. The 2SLS result in levels for 2022 (col. (2)) suggests that 10 extra Ukrainian firms increase the number of Polish firms by 4.02 firms. In the log specification of (top panel, col. (2)), the coefficient suggests that a 10% increase in Ukrainian registrations led to 2.21% more Polish firm registrations.

Results thus suggest that business creation by Ukrainian refugees did not crowd out or discourage entrepreneurship among the native-born. This is in line with survey data from the Global Entrepreneurship Monitor which shows that in 2023 and 2022, adult Poles rated the prospects for establishing a business in their immediate environment in the next 6 months as high as in 2021 (74% in 2023 vs. 72% in 2022 vs. 73% in 2021) (Global Entrepreneurship Monitor Poland, 2024). In other words, refugee firms have not affected the average entrepreneurial aspirations.

[19]Given the large number of zeros it is not possible to interpret the coefficients of the asinh specification as elasticities.

Table 6: Multiplier estimates: All firms

	Dependent variable: Polish firm registrations					
	2022			**2023**		
	(1)	(2)	(3)	(4)	(5)	(6)
	OLS	IV	Alt. IV	OLS	IV	Alt. IV
			ln			
UA firm registrations	0.126***	0.231***	0.203	0.173***	0.272***	0.199
	(0.024)	(0.056)	(0.144)	(0.026)	(0.066)	(0.148)
N	1852	1852	1852	1847	1847	1847
R-sq	0.19			0.16		
KP F stat		361.18	32.31		201.39	41.89
			asinh			
UA firm registrations	0.279***	0.446***	0.421***	0.304***	0.558***	0.585***
	(0.022)	(0.063)	(0.103)	(0.027)	(0.095)	(0.108)
N	33440	33440	33439	33440	33440	33440
R-sq	0.09			0.03		
KP F stat		46.57	19.05		42.95	15.30
			levels			
UA firm registrations	0.561**	-0.405	0.081	0.562***	0.106	0.347*
	(0.270)	(0.302)	(0.240)	(0.166)	(0.273)	(0.200)
N	33440	33440	33439	33440	33440	33440
R-sq	0.83			0.41		
KP F stat		45.22	24.48		28.39	57.50

Notes: Regressions include sector and county fixed effects and control for average Polish firm registrations during 2015-2021. Columns (1) and (4) are OLS estimates, the other columns are 2SLS. In columns (2) and (5), the IV is a shift-share (Men 18+ refugees in county × share of UA firms in sector in 2015-2021). In columns (3) and (6), the IV is a shift-share (Men 18+ refugees in county × share of UA self-employed in major sector back in Ukraine).The F stat is the first stage's Kleibergen-Paap rk Wald F statistic. Standard errors are clustered by county-sector in columns (1-2) and (4-5), and by county-major sector in columns (3) and (6). *** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$.

Table 7: Multiplier estimates: Inc. firms

	Dependent variable: Polish firm registrations					
	2022			2023		
	(1) OLS	(2) IV	(3) Alt. IV	(4) OLS	(5) IV	(6) Alt. IV
	ln					
UA firm registrations	0.177***	0.221***	0.141	0.128***	0.175**	0.162
	(0.028)	(0.054)	(0.116)	(0.034)	(0.076)	(0.123)
N	822	822	822	727	727	727
R-sq	0.23			0.15		
KP F stat		211.64	18.76		113.05	29.89
	asinh					
UA firm registrations	0.243***	0.281***	0.717***	0.298***	0.350***	0.874***
	(0.016)	(0.025)	(0.167)	(0.019)	(0.028)	(0.230)
N	33440	33440	33439	33440	33440	33440
R-sq	0.28			0.26		
KP F stat		57.50	17.34		54.73	10.67
	levels					
UA firm registrations	0.330*	0.402***	0.385***	0.597**	0.639*	0.698***
	(0.173)	(0.154)	(0.109)	(0.278)	(0.338)	(0.189)
N	33440	33440	33439	33440	33440	33440
R-sq	0.92			0.89		
KP F stat		40.95	8.61		40.10	5.34

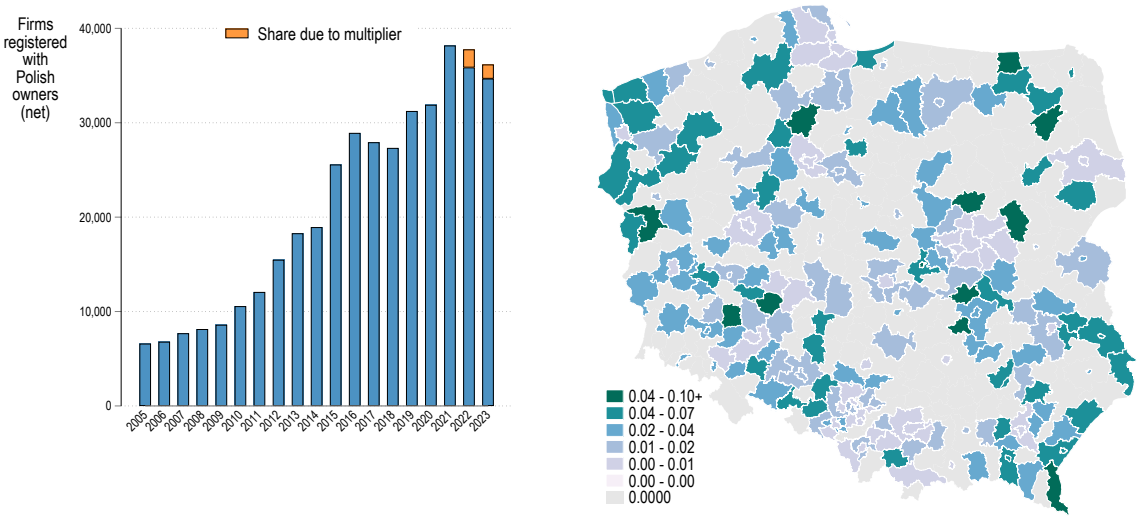
Notes: Regressions include sector and county fixed effects and control for average Polish firm registrations during 2015-2021. Columns (1) and (4) are OLS estimates, the other columns are 2SLS. In columns (2) and (5), the IV is a shift-share (Men 18+ refugees in county × share of UA firms in sector in 2015-2021). In columns (3) and (6), the IV is a shift-share (Men 18+ refugees in county × share of UA self-employed in major sector back in Ukraine).The F stat is the first stage's Kleibergen-Paap rk Wald F statistic. Standard errors are clustered by county-sector in columns (1-2) and (4-5), and by county-major sector in columns (3) and (6). *** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$.

In Figure 9 we illustrate the magnitude of our multiplier estimate for Inc. firms (that in levels, in col. (2), bottom panel in Table 7). By multiplying Ukrainian Inc. firms by our multiplier estimate, we find that the multiplier effect accounts for 5% of the 35,000+ Polish Inc. firms registered in 2022, and 4.1% in 2023. In panel (b) we show that in some counties, there would have been as much as 10% less Polish firms had there not been Ukrainian refugee entrepreneurship.

Figure 9: Magnitude of the multiplier effect of new Ukrainian firms in Poland

(a) Polish Inc. firms

(b) Share of Polish Inc. firms due to multiplier



Notes: The share due to the multiplier are obtained by multiplying UA Inc. firms by our multiplier estimate (that of col. (2), bottom panel in Table 7).

What could explain this positive multiplier effect? One possibility is *creative emulation*, whereby Polish entrepreneurs are inspired by refugees who introduce new ideas, products, or technologies, leading them to start similar businesses. This would be in line with the peer effects suggested by Wallskog (2025); Giannetti and Simonov (2009); Guiso et al. (2021); Galambos and Amatori (2016), whereby exposure to entrepreneurship inspires entrepreneurs. Supporting this interpretation, our survey shows that 59% of Ukrainian owners say Polish entrepreneurs started firms similar to theirs ($n = 110$).

Another possibility is that Polish entrepreneurs start businesses that complement new Ukrainian firms in upstream or downstream sectors. Although such linkages may take more than one to two years to develop, we nonetheless look into the presence of multiplier effects across upstream and downstream sectors in Appendix H. Our survey evidence supports this mechanism: 88% of Ukrainian business owners report that their firms supply goods or services to other local firms, while 62% purchase inputs locally.

Taken together, these findings suggest that some new Polish firms may have emerged to serve the growing network of Ukrainian businesses, both upstream and downstream.

6 Conclusion

The Ukrainian refugee influx is part of a global surge in forced displacement, affecting over 100 million people in 2022, including Syrians, Venezuelans, and many others (UNHCR, 2023b; Devictor et al., 2021). As refugee arrivals inevitably shape host-country economies, understanding their impacts is important for policy design.

Our paper documents that the 2022 wave of Ukrainian refugees in Poland triggered substantial business creation by Ukrainian owners. A 10% increase in adult male refugees in a county is associated with a 2.71% increase in Ukrainian-owned business registrations. We also find evidence of a positive multiplier effect: refugee entrepreneurship stimulates rather than displaces business creation by Polish entrepreneurs. Using shift-share instrumental variables, we estimate that a 10% increase in Ukrainian registrations leads to 2.31% more Polish firm registrations. When we focus on Inc. firms, we estimate that each new Ukrainian-owned business generates 0.4 additional Polish firms. Survey evidence points to two potential complementary mechanisms: creative emulation, with 59% of Ukrainian owners reporting Polish entrepreneurs starting similar firms, and supply chain linkages, with 88% of Ukrainian firms engaging in local business-to-business transactions. Overall, our results highlight that refugees' entrepreneurial activities can generate broad economic dynamism often overlooked in conventional analyses of wage and employment effects.

International and local organizations increasingly emphasize entrepreneurship as a key tool for refugee integration. The World Bank (2021) highlights support for refugee business creation as a way to unlock economic potential, and the OECD (2021) similarly promotes immigrant entrepreneurship. In Poland, the UN High Commissioner for Refugees (UNHCR), the European Bank for Reconstruction and Development (EBRD),

and the Polish Agency for Enterprise Development (PARP) provide legal and financial assistance to refugee-owned businesses.

Our evidence that refugee entrepreneurship generates positive spillovers rather than displacement effects reinforces these policy approaches and suggests that facilitating refugee business creation can benefit both refugees and and host communities. Yet, in many countries, refugees face legal barriers to entrepreneurship, such as lengthy asylum procedures, restricted access to work permits, and difficulties opening bank accounts or obtaining business licenses. Even when refugees have strong entrepreneurial drive, these constraints can push them into informality or prevent firm creation altogether. Giving refugees access to the formal economy unlocks their economic potential and creates positive spillovers for host communities.

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Appendix

A Business registrations in 2022-23 by owner citizenship

Sector	UA	PL	UA (%)
Computer programming, consultancy and related activities	6,168	40,172	0.13
Specialised construction activities	6,127	77,257	0.07
Other personal service activities	4,051	24,707	0.14
Land transport and transport via pipelines	2,346	20,394	0.10
Retail trade, except retail trade of motor vehicles	2,308	45,242	0.05
Construction of buildings	2,012	16,922	0.11
Wholesale trade, excluding motor vehicles	1,432	17,386	0.08
Food and beverage service activities	1,421	9,955	0.12
Manufacture of fabricated metal products	1,253	9,415	0.12
Trade of motor vehicles; repair of motor vehicles	975	14,831	0.06
Office administrative and business support activities	735	10,306	0.07
Human health activities	733	27,666	0.03
Education	730	17,861	0.04
Services to buildings and landscape activities	718	9,220	0.07
Other professional, scientific and technical activities	664	15,607	0.04
Employment activities	642	2,055	0.24
Head offices; management consultancy activities	605	13,713	0.04
Advertising and market research	447	7,820	0.05
Warehousing and support activities for transportation	446	4,995	0.08
Real estate activities	368	10,893	0.03
Manufacture of food products	340	2,476	0.12
Repair, maintenance and installation of machinery	324	6,935	0.04
Legal, accounting and tax consultancy	305	13,190	0.02
Information service activities	295	2,335	0.11
Postal and courier activities	241	1,793	0.12
Rental and leasing activities	240	3,763	0.06
Works related to construction of civil engineering	234	4,328	0.05
Missing	217	4,504	0.05
Architectural and engineering activities	164	11,404	0.01
Activities auxiliary to financial services and insurance	159	6,506	0.02
Crop and animal production	155	2,033	0.07
Manufacture of furniture	154	3,728	0.04
Motion picture, video and TV production	138	3,636	0.04
Manufacture of wearing apparel	125	1,415	0.08
Sports activities and amusement and recreation	122	3,628	0.03
Repair and maintenance of computers and household goods	119	2,270	0.05
Accommodation	116	3,917	0.03
Creative, arts and entertainment activities	107	3,268	0.03
Other manufacturing	90	1,838	0.05
Social work activities without accommodation	90	1,211	0.07
Manufacture of other transport equipment	90	379	0.19
Manufacture of products of wood and cork	81	3,347	0.02
Publishing activities	72	932	0.07
Manufacture of other non-metallic mineral products	70	1,251	0.05

Sector	UA	PL	UA (%)
Financial service activities	56	1,574	0.03
Tour operator, middlemen and reservation services	56	1,162	0.05
Telecommunications	46	786	0.06
Electricity, gas, steam and air conditioning supply	44	2,829	0.02
Manufacture of textiles	44	904	0.05
Scientific research and development	37	1,097	0.03
Manufacture of rubber and plastic	37	937	0.04
Residential care activities	32	201	0.14
Printing and reproduction of recorded media	29	958	0.03
Air transport	23	409	0.05
Manufacture of machinery and equipment n.e.c.	20	581	0.03
Manufacture of computer and electronic products	18	317	0.05
Manufacture of electrical equipment	17	364	0.04
Forestry and logging	17	1,231	0.01
Manufacture of chemicals	16	441	0.04
Activities of membership organisations	15	254	0.06
Veterinary activities	13	1,060	0.01
Waste collection, processing and materials recovery	11	561	0.02
Manufacture of leather	9	222	0.04
Manufacture of motor vehicles	9	176	0.05
Manufacture of paper products	9	350	0.03
Water transport	7	172	0.04
Manufacture of metals	7	133	0.05
Manufacture of beverages	6	122	0.05
Libraries, archives, museums and cultural activities	5	173	0.03
Security and investigation activities	4	693	0.01
Sewage disposal and treatment	3	282	0.01
Public administration and defence	3	131	0.02
Extraction of oil and gas	2	2	0.50
Mining of coal and lignite	2	2	0.50
Public and licence programmes broadcasting	1	38	0.03
Mining and quarrying support services	1	73	0.01
Fishing and aquaculture	1	64	0.02
Manufacture of tobacco products	1	4	0.20
Water collection, treatment and supply	1	58	0.02
Insurance, reinsurance and pension funding	1	114	0.01
Manufacture of coke and refined oil	1	11	0.08
Manufacture of pharmaceuticals	0	41	0.00
Extraterritorial organisations and bodies	0	0	—
Remediation activities and waste management	0	88	0.00
Gambling and betting activities	0	47	0.00
Other mining and quarrying	0	180	0.00
Mining of metal ores	0	0	—
Households as employers of domestic personnel	0	0	—

Sector	UA	PL	UA (%)
TOTAL	38,833	505,346	0.07

B Where did the refugees go and why?

In this Appendix we look into the factors that shaped refugees' settlement locations across Poland. As we write in section 2, there were immediate, vast scale, grassroots efforts to aid and welcome refugees. Tens of thousands of private cars picked refugees from the border, Polish families hosted 1.6 million refugees (McMahon, 2023), and 77% of Polish citizens helped in some way (Baszczak et al., 2022). This widespread support led to a distribution of refugees across Poland's 380 counties, roughly proportional to population (Figure B.1), with refugees registered in each and every of the 380 counties.

To examine the locational determinants of refugee settlement, we use a LASSO model, which combines variable selection and regularization to identify the most relevant location-specific predictors from a set of variables.

We consider measures of affinity with Ukraine such as the number of Ukrainians in the county in 2021 and the average number of firms registered by Ukrainian owners during 2015-2021. These capture existing Ukrainian networks as well as the "fit" of the business environment for Ukrainian entrepreneurs.

We also measure historical ethnic-Ukrainian communities using data on the 1947 deportations of Ukrainians to Western Poland during Operation Vistula, when around 140,000 Ukrainians from southeastern Poland were forcibly relocated, "scattered among the Polish population so that they do not pose any danger [to the Polish People's Republic]" (Misiło, 2012). Many deportees and their descendants remained in those counties and built cultural associations. The resettlement data were compiled by historian Eugeniusz Misiło based on transport records, and he kindly shared his data with us (see the map in the bottom left of Figure B.1.[20]

We consider transport costs from Ukraine, and specifically from Poland-Ukraine border checkpoints. We measure the geodesic distance from county centroids to the nearest border checkpoint. As many refugees traveled by train after crossing into Poland, we also look at train travel directions using Google maps. This allows us to check how long is the train journey from Premzl, just across from the Ukraine border, to each county's main train station, as well as the number of required connections. We also look at the counties' distance from UNHCR reception centers, through which many refugees passed by to receive relocation assistance (see the map in the bottom right of Figure B.1).

We also look at various local characteristics that may have affected refugees' location decisions. These include local county population, the average number of firms registered during 2015-2021 (a proxy for the local business environment), and the county's share of

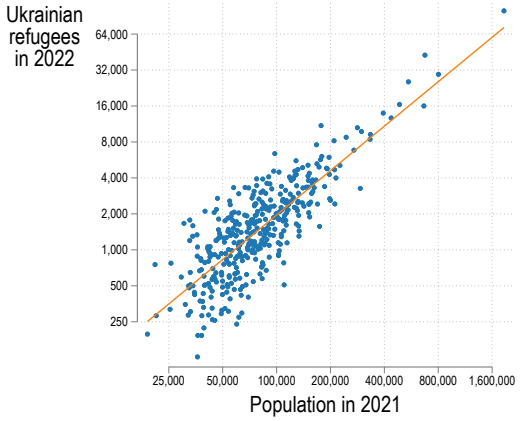
[20] Zuchowski (2024) builds an instrument based on the 1947 relocations to isolate the effect of Ukrainians in Poland in 2019.

urban population and average wages in 2021 (both from Statistics Poland). We also measure political and cultural factors that may have acted as pull factors for refugees. We look at a measure of religiosity (Grosfeld et al., 2024), as religious communities may have been more likely to welcome and host refugees, as well as a measure of political preferences based on the vote share of the far-right party in 2021. The hypothesis here would be that far-right voters are more anti-refugee.

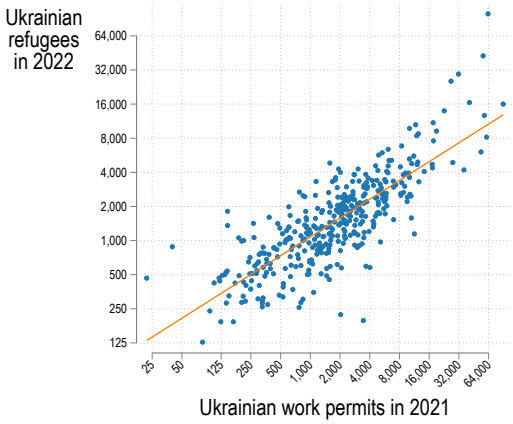
Our LASSO results in Table B.1 suggest that the only three robust predictors of Ukrainian refugees, across logarithmic and inverse hyperbolic sine specifications, are population, Ukrainians in 2021, and average firm registrations during 2015-2021. Other factors such as transports costs and far-right preferences are negatively correlated with refugee locations, but are not robust predictors when other factors are jointly considered.

Figure B.1: Ukrainian refugees in Poland - Locations

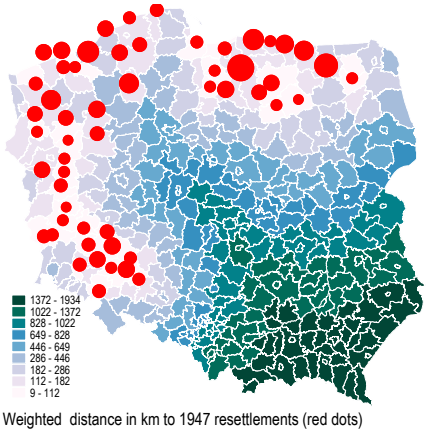
(a) Pop 2021 vs all refugees



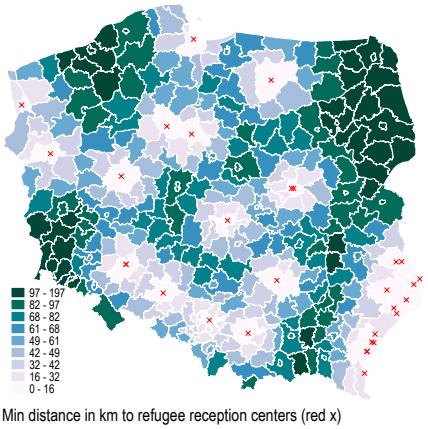
(b) Ukrainian "networks"



(c) 1947 Ukrainian settlements



(d) Distance to UNHCR reception centers



Source: PESEL, Statistics Poland, Ministry of Family, Labour, and Social Policy, (Misiło, 2012), and UNCHR.

Table B.1: Determinants of refugee locations in 2022 - LASSO

	(1)	(2)	(3)
	Total refugees	Men 18+ refugees	Women 18+ refugees
		(ln)	
Ukrainian affinity			
UA work permits in 2021	0.239	0.231	0.271
Average UA firms 2015-2021	0.032	0.100	0.022
Ukrainian resettled in 1947 (asinh)	0.000	0.000	0.000
Transport costs			
Distance to UA border	0.000	0.000	0.000
Train travel time	0.000	0.000	0.000
Nb of train legs	0.000	0.000	0.000
Min distance to UNHCR reception centers	0.000	0.000	0.000
Local characteristics			
Population in 2021	0.465	0.402	0.407
Average firms 2015-2021	0.129	0.202	0.169
Vote far-right 2019 (%)	0.000	0.000	0.000
Main condition of successful life is God (%)	0.000	0.000	0.000
Average wages in 2021	0.000	0.113	0.000
Urban (%)	0.000	0.000	0.000
N	285	285	285
		(asinh)	
Ukrainian affinity			
UA work permits in 2021	0.230	0.228	0.263
Average UA firms 2015-2021	0.000	0.083	0.000
1947 resettlements	0.000	0.000	0.000
Transport costs			
Distance to UA border	0.000	0.000	0.000
Min distance to reception centers	0.000	0.000	0.000
Local characteristics			
Population in 2021	0.348	0.236	0.299
Average firms 2015-2021	0.285	0.390	0.303
Vote far-right 2019 (%)	0.000	0.000	0.000
Main condition of successful life is God (%)	0.000	0.000	0.000
Average wages in 2021	0.000	0.000	0.000
Urban (%)	0.000	0.000	0.000
N	375	375	375

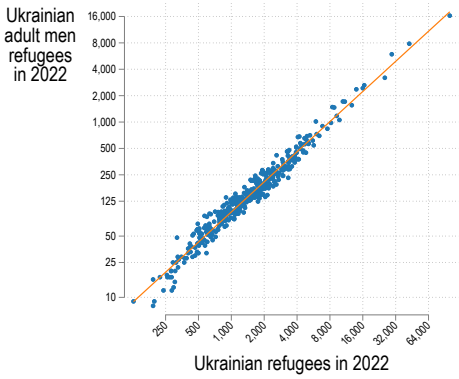
Notes: LASSO estimates. All variables are in logs (top panel), or asinh (bottom panel), except the (%) ones. Around 50 counties are unreachable by train, so we drop the two train variables in the bottom panel where we take asinh instead of logs in order to maximize the county coverage. Including these two variables reduces the sample to 335 counties but does not change the LASSO variable selection. We also do not have religion and urban variable for a total of 5 counties, which gives us a coverage of 375 counties out of 380.

C Ukrainian entrepreneurs in Poland: Gender dimensions

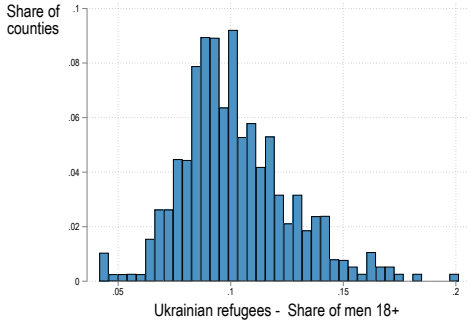
While the distribution of adult male refugees, who make up 10% of local Ukrainian refugee populations on average across counties, is highly correlated to that of total refugees across counties (Figure C.1), we find that only they are robustly correlated with new Inc. firms, unlike adult female refugees. This is confirmed when we include both adult men and women on the right hand side of eq. 1, as shown in Table C.1. Across specification, years, and sample of firms, adult male refugees remain associated with firm creation, whereas the coefficient on adult women refugees become negative, even when we include sole proprietorships and look at all firms. These results are confirmed in panel regressions using data from 2004 to 2023 that include county and year fixed effects (Table C.2). The coefficient in column (1) implies that a 10% increase in adult male refugees is associated with a 6.22% increase in Ukrainian firm registrations. By contrast, the coefficients for adult female refugees are either statistically insignificant or negative, potentially reflecting their high correlation with male refugee inflows.

Figure C.1: Ukrainian refugees in Poland - Share of men 18+

(a) Adult men vs all refugees



(b) Share of men 18+ across counties



Source: PESEL.

Table C.1: Men and Women 18+ refugees and Ukrainian firm creation in 2022 and 2023

	Dependent variable: Ukrainian firm registrations							
	ln		**asinh**		**levels**		**shares**	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
				All firms - 2022				
Men 18+ refugees in 2022	0.988***	0.717***	1.018***	0.741***	0.164***	0.004	17.910***	12.814***
	(0.210)	(0.211)	(0.213)	(0.196)	(0.022)	(0.033)	(1.966)	(1.732)
Women 18+ refugees in 2022	-0.588**	-0.247	-0.574**	-0.254	-0.035***	0.013	-3.020***	-2.163***
	(0.229)	(0.222)	(0.233)	(0.224)	(0.008)	(0.008)	(0.504)	(0.430)
N	336	299	380	380	380	380	380	380
R-sq	0.76	0.81	0.75	0.78	0.99	0.99	0.41	0.59
				Only Inc. firms - 2022				
Men 18+ refugees in 2022	0.815***	0.475*	0.806***	0.409***	0.043***	-0.092*	22.061***	8.771***
	(0.262)	(0.277)	(0.189)	(0.155)	(0.013)	(0.055)	(4.268)	(3.174)
Women 18+ refugees in 2022	-0.714**	-0.258	-0.745***	-0.284	-0.014***	0.032*	-3.485***	-1.253
	(0.289)	(0.306)	(0.220)	(0.194)	(0.005)	(0.017)	(1.177)	(0.954)
N	215	203	380	380	380	380	380	380
R-sq	0.77	0.79	0.72	0.79	0.99	0.97	0.15	0.45
				All firms - 2023				
Men 18+ refugees in 2022	0.617***	0.542***	0.568***	0.381*	0.153***	-0.002	18.500***	14.019***
	(0.173)	(0.200)	(0.203)	(0.202)	(0.030)	(0.037)	(2.130)	(1.929)
Women 18+ refugees in 2022	-0.328*	-0.105	-0.198	0.057	-0.030***	0.018**	-2.797***	-2.045***
	(0.195)	(0.221)	(0.226)	(0.235)	(0.012)	(0.008)	(0.624)	(0.571)
N	352	305	380	380	380	380	380	380
R-sq	0.77	0.78	0.75	0.76	0.99	0.99	0.47	0.58
				Only Inc. firms - 2023				
Men 18+ refugees in 2022	1.069***	0.906***	0.659***	0.261	0.015*	-0.091*	19.403***	9.071***
	(0.327)	(0.281)	(0.193)	(0.161)	(0.008)	(0.047)	(2.884)	(2.747)
Women 18+ refugees in 2022	-1.026***	-0.674**	-0.746***	-0.287	-0.006*	0.033**	-3.577***	-1.841***
	(0.331)	(0.300)	(0.217)	(0.187)	(0.003)	(0.014)	(0.724)	(0.690)
N	198	184	380	380	380	380	380	380
R-sq	0.76	0.83	0.70	0.78	0.99	0.97	0.14	0.41
Controls								
Average firms 2015-2021	Y		Y		Y			
Average UA firms 2015-2021		Y		Y		Y		Y
Population in 2021	Y	Y	Y	Y	Y	Y		
UA work permits in 2021	Y	Y	Y	Y	Y	Y	Y	Y

Notes: Estimates of the effect of adult men and adult women Ukrainian refugees in 2022 on UA firm registrations in 2022 and 2023 using equation 1 across Polish counties. The table panels with all firms include sole proprietorships and private limited companies (Inc firms). In columns 7-8, refugees are measured as share of the county population in 2021, Ukrainian firms as a share of all new firms, UA work permits as a share of county population, and average UA firms 2015-2021 as a share of average firms 2015-2021. Robust standard errors in parenthesis. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$.

Table C.2: Men and women 18+ refugees and Ukrainian firm creation - Panel estimates

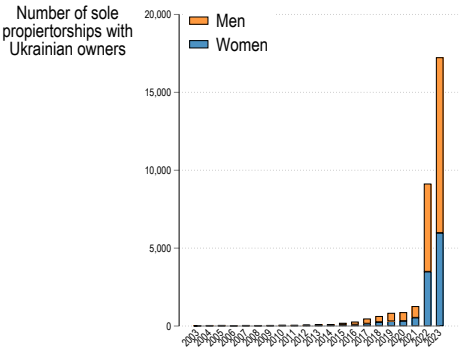
	All UA registrations				Inc. UA registrations			
	ln	asinh	levels	shares	ln	asinh	levels	shares
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Men 18+ refugees	0.622***	0.551***	0.154***	15.542***	1.005***	0.969***	0.044	13.900***
	(0.142)	(0.144)	(0.037)	(1.741)	(0.183)	(0.155)	(0.033)	(2.487)
Women 18+ refugees	-0.077	0.036	-0.015	-2.059***	-0.655***	-0.532***	-0.001	-2.234***
	(0.161)	(0.163)	(0.012)	(0.486)	(0.210)	(0.170)	(0.011)	(0.713)
Total registrations	0.480***	0.399***	0.046***		1.034***	0.411***	0.072***	
	(0.121)	(0.076)	(0.002)		(0.113)	(0.044)	(0.007)	
Constant	-2.158***	-1.706***	-14.194***	0.006***	-3.851***	-1.391***	-4.571***	0.011***
	(0.690)	(0.461)	(0.814)	(0.000)	(0.495)	(0.180)	(0.444)	(0.000)
N	4487	7599	7599	7599	1936	7599	7599	7599
R-sq	0.76	0.74	0.95	0.58	0.80	0.66	0.90	0.43

Notes: Estimates of the effect of adult men and women Ukrainian refugees in a panel of counties from 2004 to 2023 on UA firm registrations. The regressions in columns 1 to 4 with all firms include sole proprietorships and private limited companies (Inc. firms). In columns 4 and 8, refugees are measured as share of the county population in 2021, Ukrainian firms as a share of all new firms. County-clustered standard errors in parenthesis. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$.

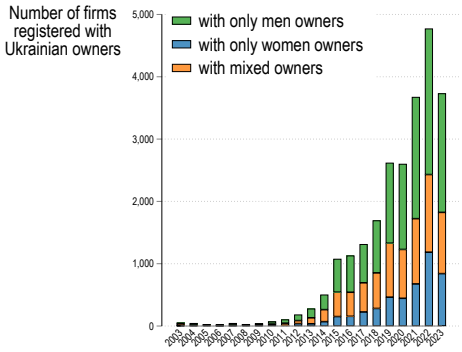
Why do we find a relationship between Inc. firms and adult male but not female refugees? These gender differences are are consistent with the fact that the majority of Ukrainian firm owners in Poland are men. The gender data in the firm registry suggests that around 65% of Ukrainian owners are men. This is the case for both sole proprietorships and Inc. firms (Figure C.2. To confirm this gender ratio, we also analyzed the names of owners with the namsor.app (and ChatGPT) and found that among the 5,000 owners of new Inc. firms in 2022, 65% are men. This name analysis (illustrated by the word cloud in Figure C.3), also suggests that 35% of these Ukrainian business owners are ethnic Ukrainian, 19% ethnic Russian, while it remains unclear for 46% of them.

Figure C.2: Ukrainian firms are more likely to be owned by men

(a) Sole proprietorships



(b) Inc. firms



Notes: Sources. KRS and CEIGD.

Figure C.3: Text analysis of the names of Ukrainian new firm owners in 2022

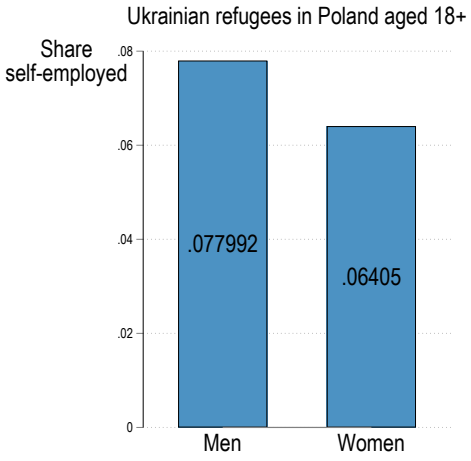
Source: CEIDG. First name analysis using namsor.app.

These gender differences may also be explained by different selection mechanisms for adult men and women refugees. Women were often mothers who fled with their children, while father stayed behind to join the war effort. Data on 5,645 refugee households comprising 13,421 individuals from the Poland Multi-Sector Needs Assessment (MSNA) survey ran by UNHCR in Jul-Aug 2023 suggest that adult women are indeed more likely to live with children (a proxy for motherhood). The data suggests 65% of adult women live with kids, while only 58% of adult men do (Figure C.4).

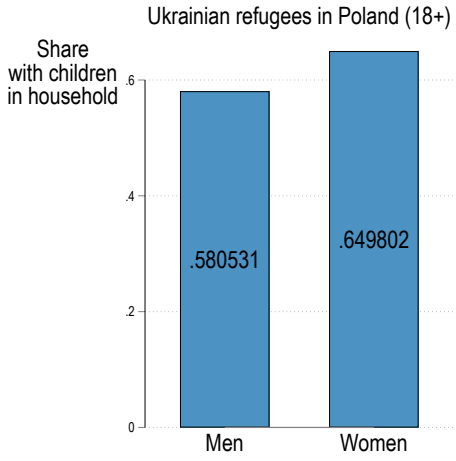
The same UNHCR survey also suggests that 7.8% of male Ukrainian refugees aged 18+ are self-employed, compared to 6.4% of women, in line with higher entrepreneurship rate among men. In Figure C.5, we show that this may be due to a selection of adult men who were already entrepreneurs back in Ukraine. Among adult Ukrainian refugees in Poland, 14.6% of men were self-employed back in Ukraine compared to 8.3% of women. This possible selection of entrepreneurs among men is also reflected in the business registry data. According to a fuzzy matching exercise of first names in the Polish and Ukrainian business registries, around 20% of Ukrainian male new business owners in Poland in 2022 also had businesses registered in Ukraine, compared to only around 13% of women (Panel (b) of Figure C.5). Since adult men were allowed to leave Ukraine only under exceptional circumstances, those who did may disproportionately represent individuals who were already entrepreneurs prior to displacement.

Figure C.4: Refugee men more likely self-employed, women more likely parent

(a) Self employment



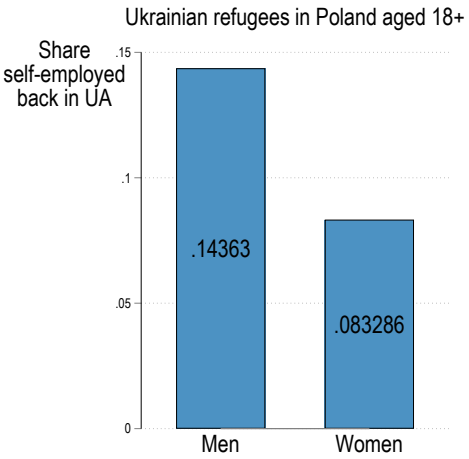
(b) Parenthood



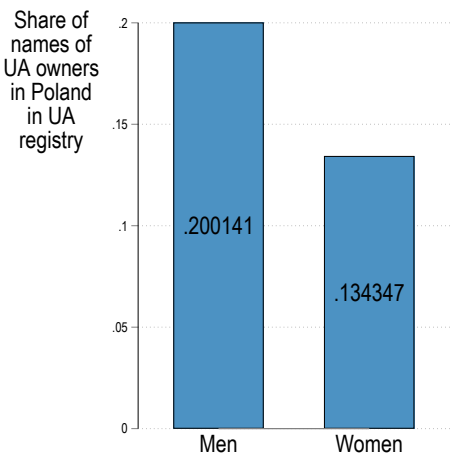
Source: The Poland - Multi-Sector Needs Assessment (MSNA) survey by UNHCR in Jul-Aug 2023 of 5,645 households comprising 13,421 individuals.

Figure C.5: Refugee men more likely to be business owners back in Ukraine

(a) Self employment in Ukraine



(b) UA owers in Ukraine registry



Source: Panel a): The Poland - Multi-Sector Needs Assessment (MSNA) survey by UNHCR in Jul-Aug 2023 of 5,645 households comprising 13,421 individuals. Panel b): CEIDG and Ukrainian business registry, available here: https://www.opensanctions.org/datasets/ua_edr/.

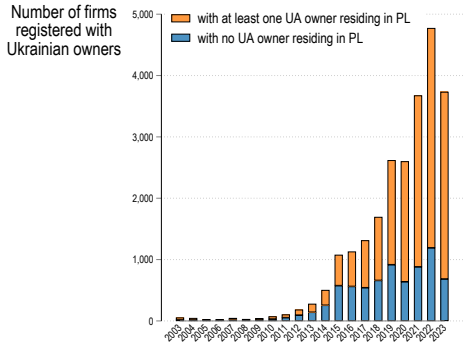
D Firm owners residing in Poland vs. or FDI

Who could the Ukrainian entrepreneurs in Poland in 2022 be, if not refugees? A possibility we explore in this section is whether the Ukrainian owners are residing in Poland or not, and hence whether some of the Ukrainian-owned businesses in Poland should be thought of as foreign direct investment (FDI). The KRS registry of Inc. firms includes information on the owners' country of residence. This allows us to estimate the number of firms with at least one Ukrainian owner residing in Poland to those with none. The numbers in panel (a) of Figure D.1 suggest that the vast majority of Ukrainian business owners are residing in Poland. The share of non-resident owners is smallest ($\approx$ 20%) after the full-scale invasion. In panel (b) of Figure D.1 we use data from another source, fDiMarkets, to estimate the number of FDI projects into Poland. The number of firms here is much smaller, yet it nonetheless captures a spike of Ukrainian businesses in Poland in 2022. It suggests 32 new Ukrainian FDI projects in 2022 created more than 2,500 jobs, mostly in Warsaw, Wroclaw, and Krakow.

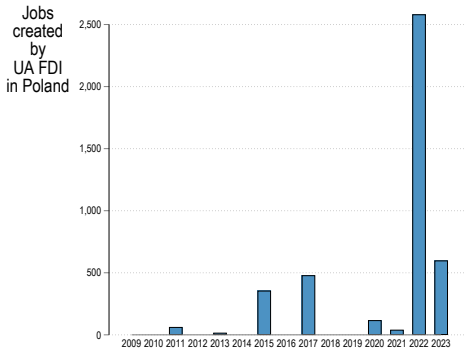
Using data on incorporated firms, we estimate Equation 1 separately for firms with Ukrainian owners residing in Poland and those with non-resident owners. The results in Table D.1 suggest that adult men refugees are **only** associated with the registration of firms whose owners live in Poland. This further confirms that refugees themselves, residing in Poland, are starting businesses, rather than attracting FDI. It also makes it less likely that the coefficient on refugees captures affinity with Ukraine broadly rather than local firm creation specifically.

Figure D.1: Ukrainian Inc. firm owners are mostly residing in Poland

(a) Firms by owners' residence



(b) FDI projects



Notes: There were 32 Ukrainian FDI projects in Poland in 2022, 20 of which in Software and IT services. Nine of these projects were in Warsaw, 5 in Wroclaw, 4 in Krakow, and the rest spread across Gdansk, Katowice, Lodz, Lublin, Poznan, and Rzeszow. Source: KRS and fDiMarkets.

Table D.1: Adult men refugees and firm creation in 2022: Owners resident in Poland vs. elsewhere

	ln		**asinh**		**levels**		**shares**	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Firms with Ukrainian owners resident in Poland							
Men 18+ refugees in 2022	0.350***	0.275**	0.215***	0.220***	0.017***	0.036	8.923***	4.982***
	(0.103)	(0.128)	(0.072)	(0.057)	(0.002)	(0.024)	(1.207)	(1.189)
Average firms 2015-2021	1.201***		1.309***		0.092***			
	(0.103)		(0.093)		(0.003)			
Average UA firms 2015-2021		0.623***		1.005***		1.748**		0.941***
		(0.055)		(0.047)		(0.869)		(0.195)
Population in 2021	-0.804***	0.187	-0.809***	0.013	-0.000***	0.000		
	(0.158)	(0.127)	(0.142)	(0.092)	(0.000)	(0.000)		
UA work permits in 2021	-0.063	-0.067	-0.055	-0.025	-0.000***	-0.001**	0.003	-0.042
	(0.057)	(0.067)	(0.042)	(0.036)	(0.000)	(0.000)	(0.042)	(0.041)
Constant	3.873**	-2.004	4.123***	-0.884	0.787	-5.674	0.003	0.000
	(1.517)	(1.309)	(1.413)	(0.973)	(0.917)	(4.577)	(0.002)	(0.002)
N	203	186	380	380	380	380	380	380
R-sq	0.76	0.79	0.71	0.79	0.99	0.95	0.15	0.33
	Firms with Ukrainian owners ***not*** resident in Poland							
Men 18+ refugees in 2022	-0.208	0.131	0.008	0.003	-0.004	-0.003	2.326**	0.514
	(0.291)	(0.282)	(0.064)	(0.051)	(0.004)	(0.004)	(1.062)	(0.642)
Average firms 2015-2021	1.107***		0.929***		0.048***			
	(0.270)		(0.126)		(0.005)			
Average UA FDI firms 2015-2021		0.503***		0.960***		2.216***		0.644***
		(0.092)		(0.053)		(0.276)		(0.059)
Population in 2021	0.122	0.438	-0.356**	0.093	-0.000	0.000		
	(0.402)	(0.292)	(0.155)	(0.070)	(0.000)	(0.000)		
UA work permits in 2021	-0.248**	-0.100	-0.141***	0.012	-0.000***	-0.000*	-0.046	-0.001
	(0.111)	(0.112)	(0.048)	(0.032)	(0.000)	(0.000)	(0.029)	(0.016)
Constant	-2.508	-4.116	1.638	-1.197	0.458	-0.718	0.002	0.000
	(3.874)	(2.676)	(1.563)	(0.746)	(1.284)	(0.829)	(0.002)	(0.002)
N	84	74	380	380	380	380	380	380
R-sq	0.61	0.69	0.52	0.73	0.93	0.97	0.03	0.44

Notes: Estimates of the effect of adult men Ukrainian refugees in 2022 on UA INc. firm registrations in 2022 and 2023 using equation 1 across Polish counties. In columns 7-8, refugees are measured as share of the county population in 2021, Ukrainian firms as a share of all new firms, UA work permits as a share of county population, and average UA firms 2015-2021 as a share of average firms 2015-2021. Robust standard errors in parenthesis. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$. An extra hundred 18+ men refugees $\rightarrow$ 1.7 extra new firms with UA owners (col 5). A 1 p.p. increase in the pop share of adult men refugees $\rightarrow$ a 4.98 p.p. increase in the UA-owned share of new firms (col 8). *** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$.

E Multiplier estimate: First stage regressions

Table E.1: First stage: All firms

	Dependent variable: Ukrainian firm registrations			
	2022		**2023**	
	(1)	(2)	(3)	(4)
			ln	
IV	6.361***		5.978***	
	(0.335)		(0.421)	
Alt. IV		0.437***		0.454***
		(0.077)		(0.070)
N	1852	1852	1847	1847
R-sq	0.21	0.04	0.17	0.05
			asinh	
IV	0.005***		0.005***	
	(0.001)		(0.001)	
Alt. IV		0.001***		0.001***
		(0.000)		(0.000)
N	33440	33439	33440	33440
R-sq	0.22	0.12	0.21	0.12
			levels	
IV	0.090***		0.077***	
	(0.013)		(0.014)	
Alt. IV		0.025***		0.027***
		(0.005)		(0.004)
N	33440	33439	33440	33440
R-sq	0.70	0.56	0.61	0.58

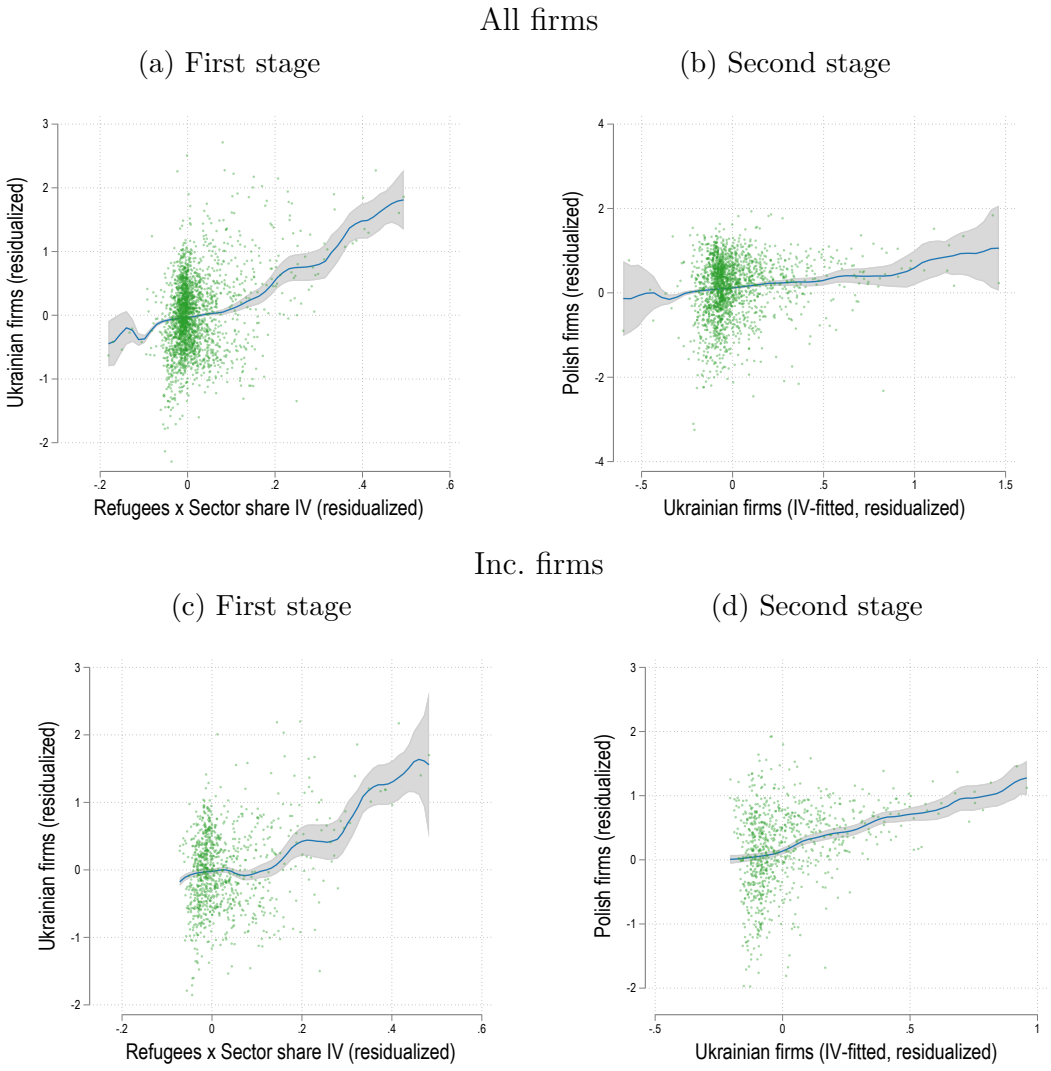
Notes: Regressions include sector and county fixed effects and control for average Polish firm registrations during 2015-2021. In columns (1) and (3), the IV is (Men 18+ refugees in county × share of UA firms in sector in 2015-2021). In columns (2) and (4), the alternative IV is (Men 18+ refugees in county × share of UA self-employed in major sector back in Ukraine). In the asinh specification, the IVs are in levels. Standard errors are clustered by county-sector in columns (1 and 3)), and by county-major sector in columns (2) and (4). *** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$.

Table E.2: First stage: Inc. firms

	Dependent variable: Ukrainian Inc. firm registrations			
	2022		2023	
	(1)	(2)	(3)	(4)
	ln			
IV	6.689***		5.203***	
	(0.460)		(0.489)	
Alt. IV		1.674***		1.629***
		(0.387)		(0.298)
N	822	822	727	727
R-sq	0.23	0.07	0.18	0.08
	asinh			
IV	0.004***		0.004***	
	(0.001)		(0.001)	
Alt. IV		0.001***		0.001***
		(0.000)		(0.000)
N	33440	33439	33440	33440
R-sq	0.34	0.20	0.33	0.20
	levels			
IV	0.070***		0.044***	
	(0.011)		(0.007)	
Alt. IV		0.001		0.010**
		(0.002)		(0.005)
N	33440	33439	33440	33440
R-sq	0.72	0.92	0.68	0.53

Notes: Regressions include sector and county fixed effects and control for average Polish firm registrations during 2015-2021. In columns (1) and (3), the IV is (Men 18+ refugees in county × share of UA firms in sector in 2015-2021). In columns (2) and (4), the alternative IV is (Men 18+ refugees in county × share of UA self-employed in major sector back in Ukraine). In the asinh specification, the IVs are in levels. Standard errors are clustered by county-sector in columns (1 and 3)), and by county-major sector in columns (2) and (4). *** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$.

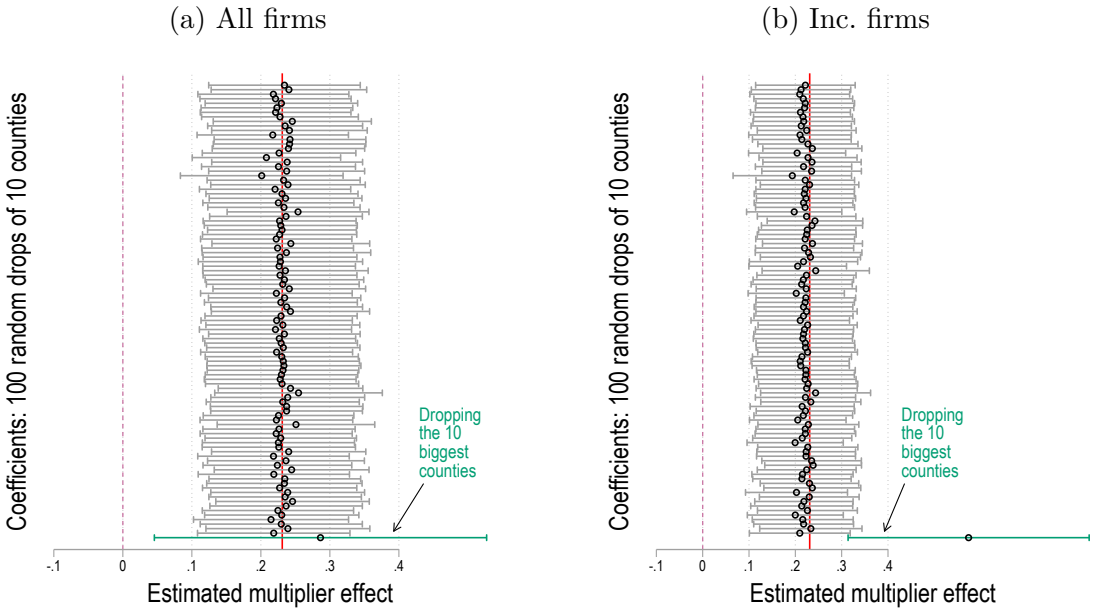
Figure E.1: Visual IV plots



Notes: The plots illustrate the first stage estimates in column (1) in the top panels (ln) of Tables E.1 and E.2, and the second stage estimates from column (2) in the top panels (ln) of Tables 6 and 7. The variables are residualized, or taken as deviations from county and sector fixed effects, as well as from the control variable Angrist and Pischke (2009)

F Multiplier estimate: Robustness to county drops

Figure F.1: Multiplier estimates: Dropping 10 counties randomly



Notes: The plots illustrate multiplier estimates for 2022 obtained by dropping 10 counties randomly, 100 times, using the specification of column (2) in the top panels (ln) of Tables 6 and 7. The red line is the multiplier estimate using the whole data sample. We also include an estimate of the multiplier on a sample where we drop the 10 biggest counties (in terms of total firms).

G Multiplier estimate: Robustness to omitted variable bias

While our empirical strategy—combining two-way fixed effects and instrumental variables—is designed to credibly identify the causal effect of Ukrainian firms on Polish firm creation, one potential concern is omitted variable bias. To assess this, we examine how likely it is to obtain our estimated coefficients if Ukrainian firm registrations were randomly reassigned across sectors within counties. The results of 100 such random shuffles, presented in Panels (a) and (b) of Figure G.1, indicate that an omitted variable at the county level is highly unlikely to explain our findings. In none of these shuffled regressions do we obtain a statistically significant coefficient, and none of the estimated confidence intervals overlap with our OLS estimate based on the actual data. This result holds whether we include all firms or restrict the sample to incorporated (Inc.) firms.

Panels (c) and (d) repeat the exercise by shuffling Ukrainian firms across counties within sectors. These results similarly suggest that omitted variables at the sector level are unlikely

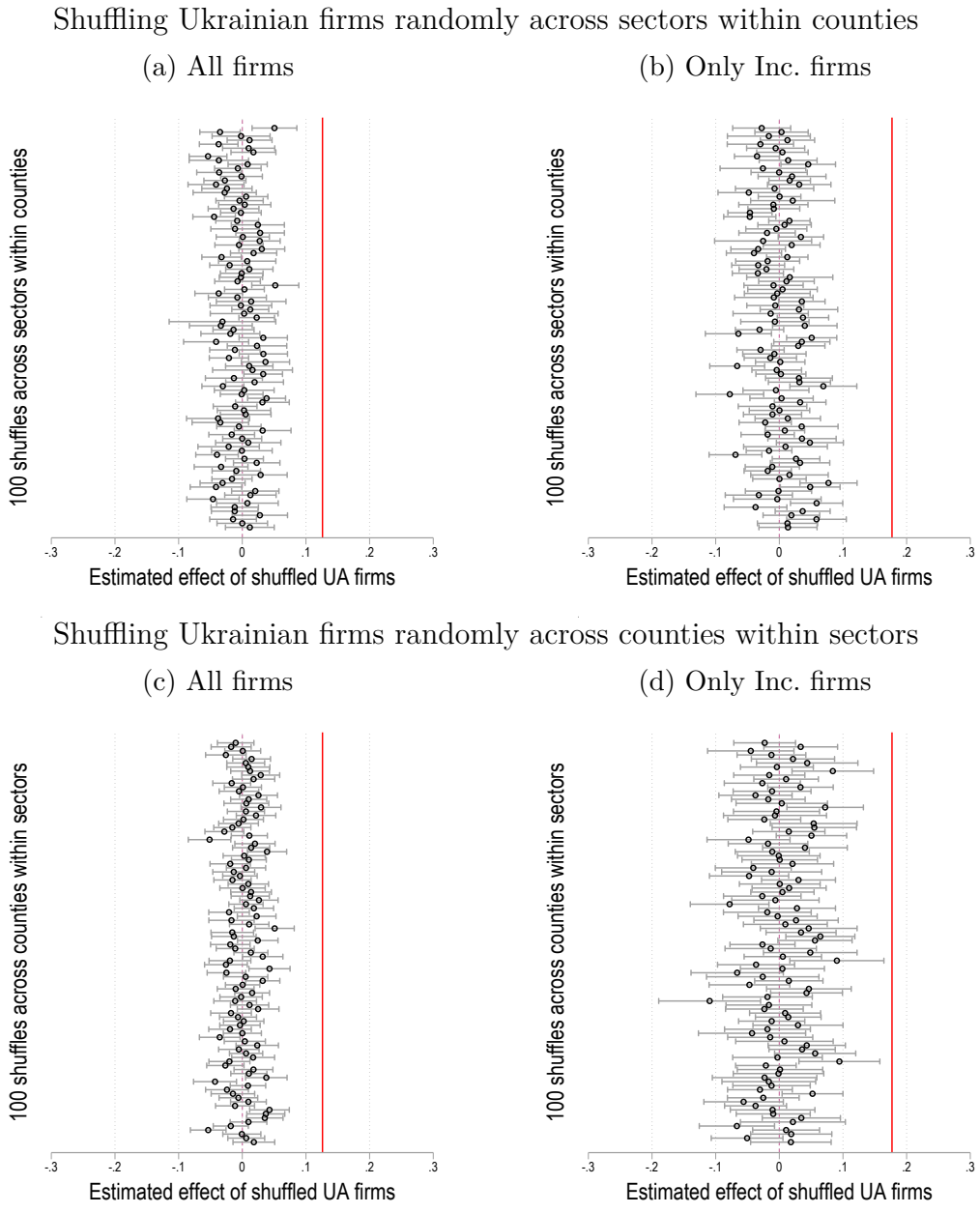
to be driving the positive multiplier effects we identify.

It may instead be that an omitted variable that captures country-sector specifics drives our estimated coefficients. While our instrumental variable strategy is designed to address this concern about OLS coefficients, we can also perform sensitivity tests based on Diegert et al. (2022a) and Cinelli and Hazlett (2020). The intuition behind these tests is to relax the assumption of "no omitted variables" and assess how the OLS coefficient estimates might change under different scenarios.

In panel (a) of Figure G.2, we use the Diegert et al. (2022b) package to compute bounds on our multiplier coefficient (from column (1) in Table 6) under alternative assumptions about the strength and correlation of potential omitted variables. The x axis measures the potential magnitude of the effect of an omitted variable on new firm registrations by Polish owners, relative to the effect of our control variable, i.e. average Polish firm registrations during 2015-2021. The different scenarios shown in the legend capture the correlation between an omitted variable and our control variable. The higher this correlation, the wider the bounds on our multiplier estimate. The bounds in panel (a) of Figure G.2 suggest that our estimate is robust to very relaxed assumptions about a potential omitted variable bias. To shrink our multiplier effect to zero, this omitted variable would need to be as predictive of new Polish firm registrations as past registrations are (a relative magnitude of 1). This is the case even if we assume this omitted variable is highly correlated with our control variable. The results are similar when we focus on Inc. firms (panel (b)), and confirm that our multiplier coefficient is unlikely to be undermined by an omitted variable bias.

Panels (c) and (d) of Figure G.2 show the results of the sensitivity tests of Cinelli and Hazlett (2020) using the Stata package Cinelli et al. (2024). Here the x-axis measures how strongly an omitted variable is correlated with the treatment, and the y-axis how strongly it is correlated with the outcome. The coefficient in the bottom left corner is our estimated multiplier effect (from column (1) in Table 6). The contour lines tell us what combinations of omitted variable strength would reduce the estimated coefficient to zero. It shows that we are indeed likely to get our multiplier estimate even under scenarios where the omitted variable is moderately correlated with the treatment or the outcome. This is even more so when we focus on Inc. firms (not shown). The plot shows that the positive multiplier is robust to confounding as strong as the observed average Polish registrations.

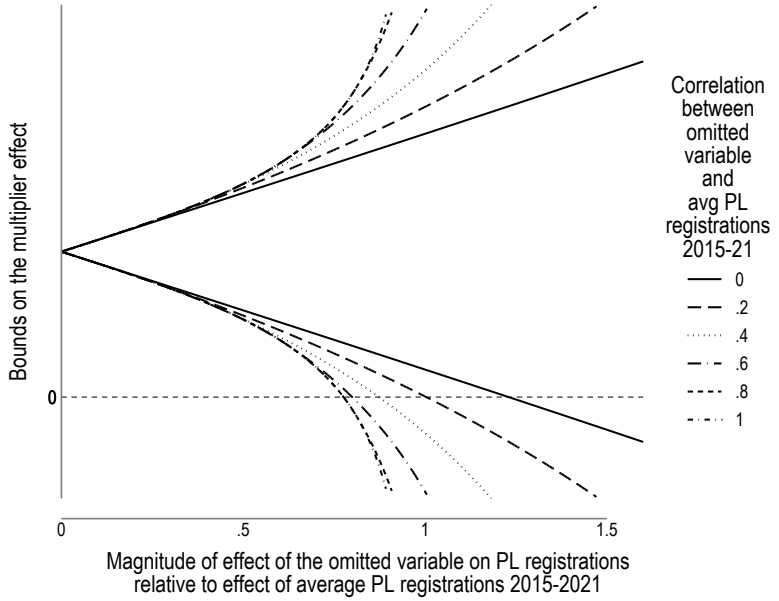
Figure G.1: Shuffling firms randomly



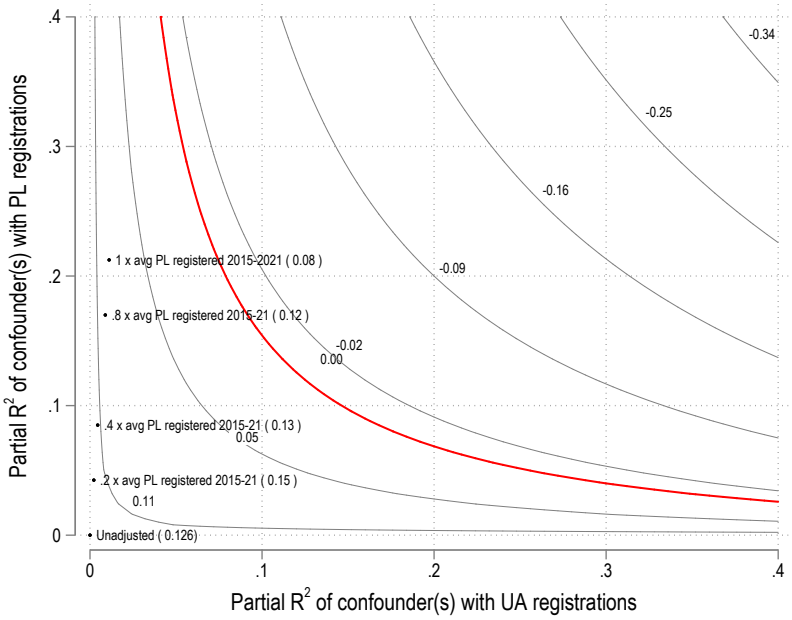
Notes: This graph shows the results of 100 regressions where UA firms registered in 2022 have been shuffled randomly, across sectors within counties in the top graphs, and across counties within sectors in the bottom graphs. It confirms that our result, the red line, is unlikely to be due to a county-level or sector-level omitted variable. This specification corresponds to column (1) in Tables 6 and 7, where we take the (ln) of variables and which controls for Polish firm creation 2015-2021.

Figure G.2: Multiplier estimates' robustness to omitted variable bias: Sensitivity tests

(a) Diegert et al. (2022a)



(b) Cinelli and Hazlett (2020)



Notes: The graphs show the sensitivity of our multiplier estimates for all firms in 2022, that from column (1) in Table 6, where we take the (ln) of variables and which controls for Polish firm creation 2015-2021, to potential omitted variables. The sensitivity tests are from Diegert et al. (2022a), stata package: Diegert et al. (2022b), and Cinelli and Hazlett (2020), stata package: Cinelli et al. (2024).

To further rule out the possibility that an omitted variable at the county–sector level drives both Ukrainian and Polish firm creation, we estimate panel regressions across counties, sectors, and years from 2011 to 2023. This specification allows us to include county–sector fixed effects to control for time-invariant unobserved heterogeneity at that level, as well as year fixed effects. We estimate both OLS and IV models, where the instrument is the interaction between the number of adult male refugees (which switches on in 2022) and either the pre-invasion share of Ukrainian firms across sectors (2015–2021) or the share of self-employed Ukrainian adult men by sector in Ukraine prior to the war. As in previous analyses, we estimate the model using logarithmic and inverse hyperbolic sine (asinh) transformations as well as in levels to include all county–sector observations.

The results in Table G.1 again point to a positive multiplier effect within county–sector over time. According to our IV estimates (column (2)), county–sectors with 10 additional Ukrainian firms in 2022 registered roughly 12.5 more Polish firms. Overall, the coefficients on Ukrainian firms are positive and statistically significant in 14 out of 18 specifications, providing further evidence of a positive multiplier effect.

Table G.1: Panel regressions with county-sector and year fixed effects

	levels			ln			asinh		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	OLS	IV	Alt. IV	OLS	IV	Alt. IV	OLS	IV	Alt. IV
	Net PL registrations								
All UA registrations	1.842***	1.253***	1.209***	0.049***	-0.006	-0.019	0.147***	0.127***	0.097***
	(0.369)	(0.241)	(0.150)	(0.006)	(0.014)	(0.023)	(0.005)	(0.015)	(0.018)
N	434720	434720	424840	11630	11630	11630	434720	434720	424840
R-sq	0.18			0.01			0.00		
F stat		142.73	25.19		69.63	28.21		195.92	280.36
	Net Inc. PL registrations								
Inc. UA registrations	2.190***	2.408***	2.151***	0.094***	-0.005	-0.064	0.368***	0.958***	0.946***
	(0.321)	(0.356)	(0.314)	(0.011)	(0.036)	(0.063)	(0.011)	(0.167)	(0.116)
N	434720	434720	424840	4899	4899	4899	434720	434720	424840
R-sq	0.33			0.02			0.02		
F stat		28.95	9.43		124.47	60.44		81.56	120.29

Notes: Regressions include county-sector and year fixed effects. In columns (2), (5), and (8), the IV is (Men 18+ refugees in county in 2022 × share of UA firms in sector in 2015-2021). In columns (3), (6), and (9), the alternative IV is (Men 18+ refugees in county × share of UA self-employed in major sector back in Ukraine). The F stat is the first stage's Kleibergen-Paap rk Wald F statistic. Standard errors are clustered by county-sector except in columns (3), (6), and (9), where they are clustered by county-major sector . *** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$.

H Multiplier estimate: Upstream and downstream sectors

What could explain a positive multiplier effect from Ukrainian to Polish firm creation? One possibility is that Polish entrepreneurs start businesses that complement new Ukrainians firms in upstream and downstream sectors. While it may take more than 1-2 years for such

linkages to form, in this section we look into the presence of a multiplier effect in upstream or downstream sectors.

To investigate upstream and downstream multiplier effects, we follow the approach of Javorcik (2004) (originally developed to identify FDI spillovers) and estimate Equation 3 with firm registrations in upstream or downstream sectors as dependent variables. To measure firm registrations upstream and downstream, we use Poland's input–output (IO) matrix for 2015.[21] The coefficients in the IO matrix allow us to compute weighted averages of firm registrations in sectors that are upstream and downstream of each focal sector.

Results of our estimated multiplier effects on downstream sectors for all firms are in Table H.1, while in Table H.2 we focus on Inc. firms. We examine upstream multiplier effects in Tables H.3 and H.4. We find suggestive evidence of a positive multiplier in both upstream and downstream sectors. These results are robust in the ainsh specifications, and even more so when we focus on Inc. firms. We do not find such effects in the logarithmic specifications however. This might be because such linkages are not yet fully formed. Another reason may be that many firms in our sample operate in services or retail rather than in complex manufacturing value chains, where clearer cross-sectoral linkages are typically observed.

[21] The IO matrix is available at: https://stat.gov.pl/download/gfx/portalinformacyjny/en/defaultaktualnosci/3300/5/3/1/input-output_table_at_basic_prices_in_2015_2.xlsx

Table H.1: Multiplier estimates: Downstream firms

	Dependent var.: Downstream PL firm registrations					
	2022			**2023**		
	(1)	(2)	(3)	(4)	(5)	(6)
	OLS	IV	Alt. IV	OLS	IV	Alt. IV
				ln		
UA firm registrations	-0.031	-0.054	0.104	-0.029	-0.017	0.064
	(0.021)	(0.080)	(0.127)	(0.025)	(0.091)	(0.133)
N	1862	1862	1862	1959	1959	1959
R-sq	0.12			0.07		
KP F stat		306.60	38.20		207.72	49.99
				asinh		
UA firm registrations	0.092***	0.136***	0.074	0.099***	0.125**	0.097
	(0.016)	(0.037)	(0.048)	(0.021)	(0.059)	(0.074)
N	29260	29260	29259	29260	29260	29260
R-sq	0.02			0.00		
KP F stat		36.45	16.07		34.00	13.38
				levels		
UA firm registrations	0.715**	-0.304	0.122	0.588***	0.157	0.319*
	(0.326)	(0.307)	(0.283)	(0.160)	(0.292)	(0.167)
N	29260	29260	29259	29260	29260	29260
R-sq	0.85			0.44		
KP F stat		36.40	24.66		21.94	61.13

Notes: Regressions include sector and county fixed effects and control for average downstream Polish firm registrations during 2015-2021. Columns (1) and (4) are OLS estimates, the other columns are 2SLS. In columns (2) and (5), the IV is a shift-share (Men 18+ refugees in county × share of Ukrainian firms in sector in 2015-2021). In columns (3) and (6), the IV is a shift-share (Men 18+ refugees in county × share of self-employed adult men Ukrainians in major sector back in Ukraine). The F stat is the first stage's Kleibergen-Paap rk Wald F statistic. Standard errors are clustered by county-sector in columns (1-2) and (4-5), and by county-major sector in columns (3) and (6). *** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$.

Table H.2: Multiplier estimates: Downstream firms - Inc.

	Dependent var.: Downstream PL firm registrations					
	2022			**2023**		
	(1)	(2)	(3)	(4)	(5)	(6)
	OLS	IV	Alt. IV	OLS	IV	Alt. IV
				ln		
UA firm registrations	0.065***	0.031	0.034	0.033	-0.025	0.056
	(0.021)	(0.054)	(0.098)	(0.028)	(0.076)	(0.113)
N	875	875	875	738	738	738
R-sq	0.14			0.09		
KP F stat		195.67	18.93		119.46	23.49
				asinh		
UA firm registrations	0.119***	0.101***	0.283***	0.138***	0.123***	0.393***
	(0.010)	(0.013)	(0.080)	(0.012)	(0.016)	(0.123)
N	29260	29260	29259	29260	29260	29260
R-sq	0.13			0.11		
KP F stat		45.70	14.10		43.58	9.52
				levels		
UA firm registrations	0.332*	0.367**	0.356***	0.582**	0.342	0.692***
	(0.174)	(0.164)	(0.110)	(0.261)	(0.302)	(0.190)
N	29260	29260	29259	29260	29260	29260
R-sq	0.92			0.89		
KP F stat		33.65	7.86		34.66	4.99

Notes: Regressions include sector and county fixed effects and control for average downstream Polish firm registrations during 2015-2021. Columns (1) and (4) are OLS estimates, the other columns are 2SLS. In columns (2) and (5), the IV is a shift-share (Men 18+ refugees in county × share of UA firms in sector in 2015-2021). In columns (3) and (6), the IV is a shift-share (Men 18+ refugees in county × share of UA self-employed in major sector back in Ukraine).The F stat is the first stage's Kleibergen-Paap rk Wald F statistic. Standard errors are clustered by county-sector in columns (1-2) and (4-5), and by county-major sector in columns (3) and (6). *** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$.

Table H.3: Multiplier estimates: Upstream firms

	Dependent var.: Upstream PL firm registrations					
	2022			2023		
	(1)	(2)	(3)	(4)	(5)	(6)
	OLS	IV	Alt. IV	OLS	IV	Alt. IV
				ln		
UA firm registrations	0.000	0.090	0.319*	0.061**	0.105	0.083
	(0.024)	(0.058)	(0.166)	(0.029)	(0.070)	(0.158)
N	1847	1847	1847	1943	1943	1943
R-sq	0.11			0.07		
KP F stat		278.55	34.94		205.72	49.42
				asinh		
UA firm registrations	0.194***	0.319***	0.340***	0.249***	0.478***	0.500***
	(0.016)	(0.033)	(0.069)	(0.022)	(0.050)	(0.100)
N	29260	29260	29259	29260	29260	29260
R-sq	0.06			0.02		
KP F stat		36.42	16.45		33.93	13.69
				levels		
UA firm registrations	0.788**	-0.420	0.123	0.552***	0.276	0.303
	(0.333)	(0.448)	(0.274)	(0.144)	(0.330)	(0.187)
N	29260	29260	29259	29260	29260	29260
R-sq	0.88			0.54		
KP F stat		22.99	27.05		12.97	65.24

Notes: Regressions include sector and county fixed effects and control for average upstream Polish firm registrations during 2015-2021. Columns (1) and (4) are OLS estimates, the other columns are 2SLS. In columns (2) and (5), the IV is a shift-share (Men 18+ refugees in county × share of UA firms in sector in 2015-2021). In columns (3) and (6), the IV is a shift-share (Men 18+ refugees in county × share of UA self-employed in major sector back in Ukraine).The F stat is the first stage's Kleibergen-Paap rk Wald F statistic. Standard errors are clustered by county-sector in columns (1-2) and (4-5), and by county-major sector in columns (3) and (6). *** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$.

Table H.4: Multiplier estimates: Upstream firms - Inc.

	Dependent var.: Upstream PL firm registrations					
	2022			2023		
	(1) OLS	(2) IV	(3) Alt. IV	(4) OLS	(5) IV	(6) Alt. IV
	ln					
UA firm registrations	0.078**	-0.020	0.019	0.039	-0.054	0.039
	(0.031)	(0.064)	(0.142)	(0.039)	(0.107)	(0.207)
N	862	862	862	738	738	738
R-sq	0.13			0.08		
KP F stat		197.88	18.16		122.28	21.08
	asinh					
UA firm registrations	0.153***	0.158***	0.490***	0.194***	0.206***	0.673***
	(0.012)	(0.018)	(0.129)	(0.015)	(0.021)	(0.205)
N	29260	29260	29259	29260	29260	29260
R-sq	0.26			0.25		
KP F stat		45.35	14.64		43.06	9.40
	levels					
UA firm registrations	0.312	0.400*	0.369***	0.545*	0.349	0.660***
	(0.207)	(0.219)	(0.124)	(0.307)	(0.354)	(0.212)
N	29260	29260	29259	29260	29260	29260
R-sq	0.95			0.93		
KP F stat		30.60	7.90		31.73	4.80

Notes: Regressions include sector and county fixed effects and control for average upstream Polish firm registrations during 2015-2021. Columns (1) and (4) are OLS estimates, the other columns are 2SLS. In columns (2) and (5), the IV is a shift-share (Men 18+ refugees in county × share of UA firms in sector in 2015-2021). In columns (3) and (6), the IV is a shift-share (Men 18+ refugees in county × share of UA self-employed in major sector back in Ukraine).The F stat is the first stage's Kleibergen-Paap rk Wald F statistic. Standard errors are clustered by county-sector in columns (1-2) and (4-5), and by county-major sector in columns (3) and (6). *** p < 0.01, ** p < 0.05, * p < 0.10.

I Refugee businesses and unemployment

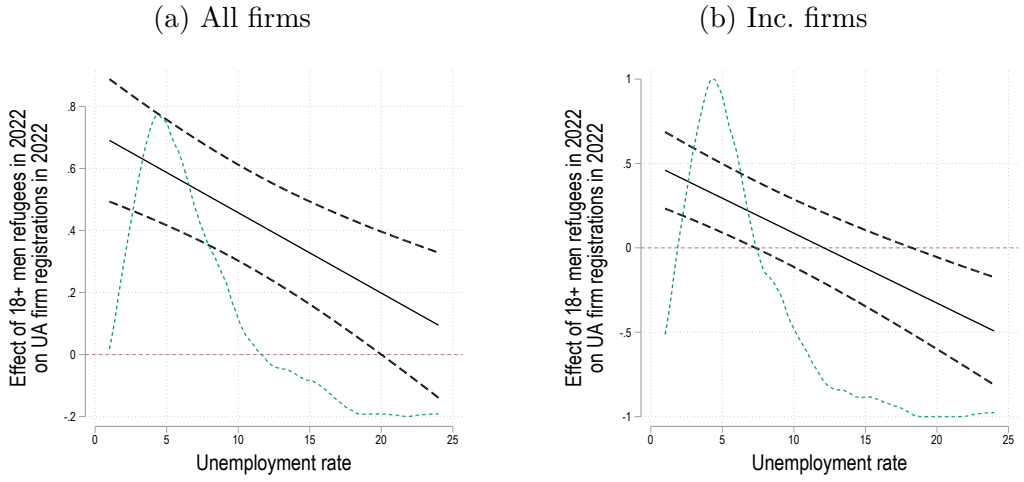
The high rate of entrepreneurship among refugees might affect the labor-market effect of refugee waves, as refugees might be as much job creators as job takers. While we do not investigate the labor-market effects of Ukrainian refugees in Poland in this paper, we consider the relationship between Ukrainian refugee entrepreneurship and unemployment in this section. To do so, we look at whether the number of Ukrainian firms registered in a county affected the local unemployment rate. We look at the change in unemployment from 2019, before the refugee wave and the COVID shock, to 2024, two years after the refugee inflow. We estimate regressions across 380 counties, controlling for factors that might explain unemployment changes such as a dynamic business environment or a high unemployment rate to begin with.

Results in Table I.1 suggests that counties with more Ukrainian businesses saw larger

declines in unemployment. Although the relationship loses statistical significance when we control for previous average total firm registrations, it remains negative (column 8). This lower-bound estimate suggests that a 10% increase in Ukrainian firms is associated with a 0.009 drop in the unemployment rate. We find a similar negative relationship between Ukrainian adult men refugees and unemployment. Overall, during this period of records-low and decreasing unemployment—in January 2025 Poland's unemployment rate hit its lowest level ever according to Eurostat, at 2.6%—it is likely that Ukrainian refugees contributed to further lowering unemployment rates.

A recurring question in the migrant entrepreneurship literature is whether migrants start businesses because they are discriminated against in the job market. If this were the case, we would expect higher rates of entrepreneurship in areas with higher unemployment, where they'd find it hardest to find a job. In Figure I.1 we show that the positive effect of adult male refugees on business creation is not concentrated nor strongest in high-unemployment counties. This suggests that necessity is unlikely to be the main driver of refugee entrepreneurship in this context. Moreover, a survey by Dębkowska et al. (2022) finds that only 16% of Ukrainians who registered businesses in Poland in 2022 did it due to the "difficulty finding salaried employment in Poland". Our survey suggests only 25% did. Ukrainian refugees were more likely to start business in areas where the unemployment level was low, and even in those locations, it might have contributed to further reductions in the unemployment rate.

Figure I.1: Refugee effect on Ukrainian firm creation: Interaction with unemployment



Notes: Estimates of the effect of Ukrainian adult men refugees in 2022 on UA firm registrations in 2022. The estimated equation is based on that in col. 2 of Table 5, controlling for population in 2021, Ukrainians in 2021, and average UA firm creation 2015-2021, and where we interact UA refugees with the county's unemployment rate. The dashed lines are 90% confidence intervals. The short-dashed green line is the density estimate of unemployment across counties.

Table I.1: Ukrainian refugee entrepreneurship and local unemployment

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Δ unem 2019-24	Δ unem 2019-24	Δ unem 2019-24	Δ unem 2019-24	Δ unem 2019-24	Δ unem 2019-24	Δ unem 2019-24	Δ unem 2019-24
Men 18+ refugees in 2022 (ln)	-0.327***	-0.290*	-0.201	-0.049				
	(0.075)	(0.151)	(0.159)	(0.190)				
All UA firms in 2022 (ln)					-0.303***	-0.270***	-0.247**	-0.088
					(0.049)	(0.079)	(0.097)	(0.124)
Unemployment rate 2019	-0.120***	-0.119***	-0.117***	-0.136***	-0.116***	-0.118***	-0.117***	-0.136***
	(0.027)	(0.027)	(0.027)	(0.029)	(0.027)	(0.028)	(0.028)	(0.031)
Population in 2019		-0.081	-0.015	0.559**		-0.114	-0.104	0.421
		(0.242)	(0.248)	(0.272)		(0.190)	(0.195)	(0.270)
Average UA firms 2015-2021			-0.133**				-0.032	
			(0.064)				(0.077)	
Average firms 2015-2021				-0.636***				-0.542**
				(0.184)				(0.233)
Constant	2.381***	3.113	1.878	-2.826	1.341***	2.577	2.414	-1.654
	(0.488)	(2.105)	(2.277)	(2.434)	(0.231)	(2.067)	(2.154)	(2.463)
N	380	380	380	380	352	352	352	352
R-sq	0.08	0.08	0.09	0.11	0.10	0.10	0.11	0.12

Notes: Estimates of the effect of Ukrainian adult men refugees in 2022 on changes in the local unemployment rate. Robust standard errors in parenthesis. *** p < 0.01, ** p < 0.05, * p < 0.10.

J Survey questionnaire

To field the survey, we sent emails to around 10,000 business email addresses publicly available on the KRS and CEIDG business registries. The survey was drafted in English and then translated into Ukrainian, Polish and Russian by survey experts at the Institute for Structural Research in Warsaw (71% of owners chose to answer in Ukrainian, and 12% in Russian). We also collaborated with several partner organizations, including Ukrainian business associations and trade networks in Poland, UNHCR, and the Federation of Employers of Ukraine, who disseminated the link through their networks. The survey was hosted at badaniefirmua.pl, went live in March 2025, and remained open for one month. Respondents were informed about the voluntary nature of the study, assured of anonymity, and asked to provide informed consent before proceeding. No personally identifiable information was collected, and there was no possibility of recontacting participants. Upon completion, respondents received a digital supermarket (Biedronka) voucher worth 50 PLN (≈ 14 USD).

Survey on Ukrainian Entrepreneurs in Poland

Dear Respondent,

We are conducting an in-depth survey to gain a better understanding of Ukrainian entrepreneurs and businesses operating in Poland. Our goal is to explore various aspects of these firms, including how they operate, the challenges they face, and their plans for the future. By participating in this survey, you will contribute valuable insights that can help shape support strategies for Ukrainian businesses in Poland.

Please be assured that your responses will remain strictly confidential and will only be used for research purposes.

We appreciate your time and participation in this survey, and we thank you for your contribution.

Section 0: Respondent's Demographics

1. How old are you? _____

2. What is the highest level of education you have completed?

- Less than high-school diploma
- High-school diploma or GED certificate
- 1 to 3-years of college
- 4-year college degree
- Masters or Professional Degree
- PhD

3. What is your gender?

- Female
- Male
- Other or prefer not to say

4. Were you living in Ukraine as a legal resident before leaving the country?

- Yes
- No

5. What is the name of the city / town / village you were residing in before leaving Ukraine? _____

6. In which month and year did you decide to reside in Poland? _____

Section 1: Firm Demographics

1. Location of Firm (if there are multiple locations, please enter the location of the headquarters):

[drop-down list of voivodships]
[drop-down list of counties]

2. Ownership Status:

- Private
- Family-owned
- Foreign-owned
- Other (Please specify)

3. Firm Size (number of employees including the owner):

- 1
- 2-9
- 10-49
- 50-199
- 200-499
- 500+

4. Main Industry of Operation (2-digit PKD code): _____

[drop-down list with sector names]

5. Month and Year of Establishment: _____

6. Majority owner's gender:

- Male
- Female
- Prefer not to say

7. Nationality of the majority owner:

- Polish
- Ukrainian
- Other (Please specify)

8. Place of residence of the majority owner: _____ [drop-down list of counties]
[drop down list of countries that starts with Poland and Ukraine, followed by ROW]

If Poland, then:
[drop-down list of voivodships]
[drop-down list of counties]

Ask the following questions if the owner is Ukrainian.

Section 2: Background

1. What were the primary reasons that led you to start your own business? (Please select all that apply)

- Lack of suitable job opportunities in Poland
- Desire for independence and to be my own boss
- Moved business from Ukraine
- Opportunity in the market that I could fulfill
- Advice or encouragement from other Ukrainians
- Lack of Polish language skills
- Other (Please specify)

2. Prior to starting your business, how long did you search for employment in Poland?

- Did not search for employment
- Less than 3 months
- 3 to 6 months
- More than 6 months

3. Have you applied for a Polish ID number (PESEL) as a refugee?

- Yes
- No
- Prefer not to answer

4. Where were you residing in Ukraine before the outbreak of the full-scale war in February 2022?

[drop-down list of regions (Ukr. *oblast*)]
[drop-down list of districts (Ukr. *rejon*)]

5. When was the first time you arrived to live in Poland?

- Before 2022 to work
- Before 2022 to study
- In 2022 before the Russian invasion (before 24 February 2022)
- In 2022 after the Russian invasion (after 24 February 2022)

Ask only if moved to Poland before 2022 to work or study [based on Q.5.]

6a. Which province you were residing in Poland before the outbreak of the war in Ukraine?

[drop-down list of voivodships]
[drop-down list of counties]

6b. Which province are you residing in Poland now?

[drop-down list of voivodships]
[drop-down list of counties]

7. Have you received any support from Ukrainian communities or networks in establishing your business?

- Yes
- No

If yes, what type of support did you receive? (Please select all that apply)

- Financial assistance
- Business advice and mentoring
- Customer referrals
- Legal or bureaucratic guidance
- Suggestions on the location of business
- Other (please specify)

8. Did you own a business in Ukraine prior to moving to Poland?

- Yes
- No

9. Did you transfer your business operations from Ukraine to Poland?

- Yes
- No
- Partially

10. Do you consider your business to be a long-term or short-term venture?

- Long-term
- Short-term
- Unsure

11. Who are your primary customers?

- Mostly Polish people/businesses living in Poland
- Mostly Ukrainian people/businesses living in Poland
- Mostly Ukrainian people/businesses living in Ukraine
- Both Polish and Ukrainian people/businesses living in Poland
- International

12. Does your firm primarily supply goods or services to other firms locally? (Please select one option)

- Goods
- Services
- Both goods and services
- Neither

13. Does your firm primarily purchase goods or services from other firms locally? (Please select one option)

- Goods
- Services
- Both goods and services
- Neither

14. What are the nationalities of your firm's employees? [Should add up to 100]

- Share of Ukrainians:
- Share of Polish:
- Share of other nationalities:
- I am unsure

15. Does your business engage in any form of trade or business with Ukraine?

- Yes
- No

16. Do you plan to continue running/expanding your business in Poland after the war ends in Ukraine?

- Yes, I plan to stay and grow my business in Poland
- No, I plan to move back to Ukraine
- I am unsure

17. What was the initial capital investment required to start your business?

- Less than 5,000 PLN
- 5,000 to 9,999 PLN
- 10,000 to 49,999 PLN
- 50,000 to 99,999 PLN
- More than 100,000 PLN

18. Did you face any challenges in securing capital or financing for your business?

- Yes
- No

19. What were your sources of funding? (Please select all that apply)

- Personal savings
- Loans from banks
- Grants from non-profits or government
- Investments from family or friends
- Other (Please specify)

20. Does your firm face competition from many similar local firms?
(Please select one option)

- Yes, there are many similar local firms
- Yes, but only a few similar local firms
- No, there are no similar local firms

21. Have any Polish entrepreneurs started firms to do business with your firm?
    (Please select one option)

- Yes
- No
- Unsure

22. Have any Polish entrepreneurs started firms that are similar to your firm?
    (Please select one option)

- Yes
- No
- Unsure

23. What are the biggest challenges your business faces in Poland?
    (Please select all that apply)

- Finding skilled employees
- Navigating legal and bureaucratic regulations
- Accessing finance or capital
- Building a customer base
- Competition from other businesses
- Language barriers
- Cultural differences
- Other (please specify)