Borders at Risk: The Impact of Russian Aggression on FDI

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Abstract

Russia's 2022 invasion of Ukraine increased the probability of a Russia-NATO confrontation in Eastern Europe. This paper explores to what extent the sudden rise in geopolitical risk has led multinational corporations to reduce greenfield FDI in Eastern European NATO members. We argue that any negative effect on FDI should increase with a location's proximity to Russia, as closer proximity facilitates access for the Russian military. Using georeferenced FDI data and a difference-in-differences design, we test this hypothesis empirically—with the post-February 2022 fall in a location's attractiveness for FDI as the treatment and proximity to Russia as the treatment intensity. We find that locations closer to Russia have indeed seen sharper falls in FDI, with the difference being economically significant. This finding is robust and unlikely to be driven by channels other than a change in geopolitical risk. We conclude that multinational corporations pay close attention to changes in location-specific security conditions.

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Keywords: FDI, geopolitical risk, conflict, Ukraine invasion, Eastern Europe, GIS data

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1 Introduction

Russia's full-scale invasion of Ukraine in February 2022 came as a shock to much of Europe, suddenly placing doubts about the national security of Ukraine's regional neighbors at the center of the debate. Meanwhile, questions concerning the implications for the region's economies have received less attention. This paper explores the economic repercussions of Russia's aggression, examining its impact on foreign direct investment (FDI) flows to the Eastern European members of the North Atlantic Treaty Organization (NATO).[1] FDI generates positive productivity spillovers in emerging economies (Smarzynska Javorcik, 2004) and, since the fall of the Iron Curtain, has played an important role in driving economic growth in Eastern Europe (Bijsterbosch and Kolasa, 2010). By focusing on Ukraine's regional neighbors, we contribute to a dynamic literature on the consequences of war for neighboring economies that are not directly involved in the fighting (e.g., Couttenier et al., 2024; Federle et al., 2024).

A plausible channel through which the war in Ukraine may affect FDI flows to the alliance's eastern members is multinational corporations reassessing geopolitical risk. With the invasion, the likelihood of a Russia-NATO confrontation in the region has increased. NATO is Kyiv's main ally, which carries the risk that the alliance may be inadvertently drawn into the war (Frederick et al., 2023). Moreover, the full-scale invasion can be seen as new evidence that Russia is pursuing a grand plan to reestablish the Soviet Union's sphere of influence—by force, if necessary. Western experts appear to consider the existence of such a plan as increasingly plausible, suggesting that "a future military invasion of one or more NATO countries is a distinct possibility." (Niec and Jensen, 2024). Clearly, a Russia-NATO confrontation in Eastern Europe could impose significant losses on businesses, ranging from operational disruptions to the destruction of production facilities. Thus, when multinational corporations perceive a rise in the chance of such a scenario, they may reduce investment in the region.

Of course, a changing assessment of regional geopolitical risk is not the only factor that can influence FDI flows to Eastern Europe. A broader, potentially opposing influence is the ongoing reordering of global supply chains as a result of the US-China decoupling (Freund et al., 2024). Since the region still offers relatively low wages and lenient regulation (Eurostat; The Economist), this orthogonal process might attract fresh FDI to the alliance's eastern members. Near-shoring efforts in the aftermath of the pandemic, aimed at strengthening the resilience of supply chains for Western Europe, may further reinforce this trend (fDi Intelligence). How,

[1] The set of Eastern European NATO members consists of Bulgaria, the Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Slovakia, and Romania. The three Baltic states—Estonia, Latvia, and Lithuania—were part of the Soviet Union until 1991. Bulgaria, Czechoslovakia (now split into the Czech Republic and Slovakia), Hungary, Poland, and Romania were Soviet satellite states belonging to the Warsaw Pact until 1991.

then, can we identify a potential effect of a revised assessment of geopolitical risk?[2] In this regard, we argue that an increase in the likelihood of a Russia-NATO confrontation in Eastern Europe does not imply that the attractiveness of all investment locations in the region decreases to the same extent. The Ukrainian experience is that conflict events are not evenly distributed across space, but tend to concentrate in areas that are relatively close to the Russian border (World Bank et al., 2024). As a consequence, the increase in the likelihood of a Russia-NATO confrontation leads to a greater rise in the expected costs from disruptions and destruction in locations closer to Russia than in those further away. The main hypothesis we explore in this paper is thus as follows: Since February 2022, FDI flows to locations in Eastern European NATO members that are closer to the Russian border have slowed more, or grown less quickly, compared to FDI flows to locations that are farther away from Russia.

To test this hypothesis, we use a difference-in-differences design with continuous treatment intensity (as, e.g., in Korovkin and Makarin, 2023). In this design, the locations (districts, alternatively grid cells) within the combined area of Eastern European NATO members constitute the treated units. The post-February 2022 harm to a location's attractiveness as an FDI destination, due to the increased likelihood of a Russia-NATO confrontation, is considered the treatment. To capture the hypothesis that the expected harm is greater in locations closer to Russia, the treatment indicator is interacted with a continuous measure of treatment intensity—a location's proximity to the Russian border. To account for time-invariant determinants of FDI flows, we include district and country fixed effects, while year-month fixed effects capture varying influences that affect all locations in the same way (such as the reordering of supply chains due to the US-China decoupling or near-shoring). The identifying assumption is that, absent Russia's full-scale invasion of Ukraine starting in February 2022, FDI flows to locations with different proximity to Russia would have evolved along parallel trends. The parallel-trends assumption is substantiated at a later stage in the paper.

Our analysis uses data from fDi Markets, a commercial provider of information on newly announced greenfield FDI projects.[3] The information includes capital expenditure in current US dollars (USD). The fDi Markets database is very detailed in both the spatial and temporal dimensions, as it also specifies a project's destination city and month of announcement. In total, we observe about 21,500 projects in Eastern European NATO members from January 2003 to June 2024; they originate from all over the world. Proximity to Russia is based on the

[2] The distinction between global determinants of changes in FDI flows—referred to as push factors such as supply-chain reordering—and country-specific determinants—pull factors such as reassessments of location-specific geopolitical risk—has a long tradition in FDI research (see, e.g., Hassan et al., 2024).

[3] Greenfield FDI refers to investment projects in which a multinational corporation does not simply acquire an existing business, but either opens a completely new operation or expands an existing one.

shortest road distance from subnational locations in Eastern European NATO members to the nearest border checkpoint into Russia. Proximity thus does not simply reflect beeline distance, but takes into account that invading armies, too, have to navigate obstacles such as rivers and mountains. To calculate the road distances, we employ resources like geoBoundaries (for the ADM2 administrative boundaries) and Open Street Maps (for the roads).

We find that the Russian invasion of Ukraine indeed deterred FDI into Eastern Europe's NATO members. Consistent with the main hypothesis, locations closer to Russia in terms of road distance experienced a sharper decline in FDI inflows after February 2022 than those farther away. Our baseline estimation rests on administrative districts. With this spatial resolution, a standard deviation in the proximity to Russia corresponds to 569 km. The estimation result suggests that, when considering two districts, with the first being 569 km closer to Russia than the otherwise similar second, the post-February 2022 decline experienced by the first district is larger by 2.6 percentage points. When extrapolated to the scale of an average Eastern European NATO member (measured by the number of districts), this corresponds to a differential effect of USD 110 million per year in absolute terms—a significant amount.[4] For Russia, which appears to perceive economic progress in its democratic neighborhood as a threat, this may be an unintended but welcome side effect of its attack on Ukraine.

Our findings may be of interest beyond a strictly economic and Eastern European context. From a geopolitical perspective, they contribute to the debate on the military threat Russia poses to the rest of Europe. Since February 2022, Western politicians, diplomats, and military officials have repeatedly warned that Russia's "maximum intentions" extend beyond Ukraine to include parts of Eastern Europe's NATO members (Walt, 2024; Monaghan et al., 2024), often citing a heightened risk of a Russian attack on those members. While such warnings may reflect genuine risk assessments, they could also serve special interests, including higher defense spending. The current analysis provides insights into whether concerns about increased risk extend beyond the circle of politicians, diplomats, and military officials. Indeed, our findings support the view that, collectively, multinational corporations agree on the heightened risk of a Russia-NATO confrontation in Eastern Europe—whether because they also believe in broader "maximum intentions" or simply perceive an increased risk of inadvertent escalation. In addition, the finding that FDI falls more sharply with proximity to Russia implies that multinational corporations pay close attention to changes to location-specific geopolitical risk. This implication may be of interest to US allies in the Indo-Pacific, including Japan, the Philip-

[4] Over the observation period from January 2017 to June 2024, the average Eastern European NATO member received greenfield FDI amounting to USD 4.2 billion per year.

pines, South Korea, and Thailand: It warns regional US allies that they should be prepared for the possibility that even a mere increase in the probability of a military confrontation over Taiwan between China and the US could reduce FDI flows to their shores.

The main result of a differential effect on FDI inflows according to proximity to Russia remains robust across a number of modifications to the estimation. In particular, it does not depend on the choice of spatial resolution, as it is also obtained when we use grid cells of size $0.25° \times 0.25°$ or $0.5° \times 0.5°$. Nor does it depend on using road distance or the USD value of FDI flows: It holds when we use beeline distance or the simple count of new FDI projects. Likewise, the result remains stable when excluding individual countries. We also find no evidence that our findings are driven by channels other than the reassessment of geopolitical risk. One such alternative channel would be multinational corporations scaling back investment near active combat zones. However, when we additionally control for proximity to Ukraine, the estimated effects of proximity to Russia remain unchanged. Another alternative channel is that the Western trade sanctions against Russia reduce FDI flows to Eastern European NATO members by restricting exports to a large neighboring market. We examine this by disaggregating FDI flows based on the tradability of an investment project's output—and then perform the baseline estimation separately for "tradable flows" and "non-tradable flows". We find that the effect on the former is only slightly larger than that on the latter, suggesting that the Western sanctions are not an important cause of the reductions in FDI after February 2022.

There are, of course, additional meaningful ways to disaggregate FDI flows, providing insights into the underlying mechanisms. Disaggregating FDI into flows financing new projects and those financing expansions of existing ones reveals that the negative effect is approximately twice as large (in absolute magnitude) for the former. This may reflect the fact that expansions can be implemented more quickly and therefore begin generating income streams sooner, making such projects less sensitive to changes in geopolitical risk. Finally, disaggregating FDI flows by source country reveals that the baseline effects are mainly driven by EU and EFTA countries (and by countries aligned with them on Ukraine).

Literature and contribution. This paper relates to four distinct strands of literature. The first link is to a long-established literature on the impact of international commerce, particularly trade in goods, on the likelihood of interstate war, with key contributions by Polachek (1980), Mansfield (1995), Martin et al. (2008), and others. As highlighted in a recent survey by Thoenig (2023), a core hypothesis of this strand can be traced back to Montesquieu: By increasing the opportunity costs of war, international commerce can have a pacifying effect.[5] The current project, too, considers the relationship between international commerce and the likelihood of war—but examines the opposite direction of causality: It identifies the effect of a sudden rise in the expected costs from war, triggered by the post-February 2022 hike in the probability of a Russia-NATO confrontation, on the size of FDI flows to Eastern Europe.

A second strand of literature to which this paper relates is the one on FDI. For some time, attention has focused on exploring how recipient-specific political and institutional risks—such as confiscatory taxes, outright expropriation, and weak safeguards on executive power—affect foreign investment decisions by multinational corporations and banks. Key contributions include Jensen (2008), Papaioannou (2009), Kesternich and Schnitzer (2010), and Besley and Mueller (2018). With geopolitical tensions rising, recent research, such as the cross-country panel study by Bussy and Zheng (2023), has begun to focus on the impact of geopolitical risk. Using conference call transcripts of publicly listed corporations, Hassan et al. (2024) construct a broad measure of recipient-specific risk—which includes not only political and geopolitical risks, but also, for example, supply-chain risks—and examine its effect on capital flows. Our paper shares the focus on recipient-specific factors but deviates from existing work in two key dimensions. First, we leverage the post-February 2022 rise in the likelihood of a Russia-NATO confrontation, which is an exogenous shock to the attractiveness of investment locations in Eastern Europe, to identify causal effects in a difference-in-differences setting. Second, we take advantage of the fact that our FDI data are georeferenced and conduct our analysis at the district, rather than the country, level; this allows us to use proximity to Russia as a measure of treatment intensity in the difference-in-differences setup. We are not aware of any existing analysis linking geopolitical risk and FDI flows at the subnational level.

Third, there is a connection to the literature on geoeconomic fragmentation. As discussed in Aiyar et al. (2023), this strand of literature explores how rising geopolitical tensions increasingly fragment international commerce along geopolitical bloc boundaries, with several areas of focus. One includes (partly theoretical) contributions such as Clayton et al. (2024) and Broner et al. (2024), concentrating on international trade. Another area, more closely related to the current paper, focuses on financial flows and includes, among others, Aiyar et al. (2024) as well as work by the International Monetary Fund (2023, Chapter 4). What distinguishes our work from these contributions, in addition to the empirical approach, is that we are not interested geopolitical bloc boundaries as dividing lines, but rather in how rising geopolitical tensions

[5] The empirical evidence only partially supports this hypothesis. A related hypothesis states that countries that are more dependent on each other in international trade tend to align more closely politically, for example by establishing formal alliances. Kleinman et al. (2024) find evidence in support of this hypothesis.

affect the spatial distribution of FDI flows within a geopolitical bloc—focusing on NATO's vulnerable Eastern European flank.

Finally, this paper contributes to the literature exploring spillover effects of conflict on areas not directly affected by the fighting. One line of research, including Federle et al. (2024), focuses on how war affects the development of macroeconomic aggregates in nearby countries that are not parties to the conflict; it also emphasizes the role of geographic proximity. Another line, including Korovkin and Makarin (2023) and Couttenier et al. (2024), examines the effects that geographically contained conflicts in one part of a country have on other, not directly affected parts, in particular via international or within-country trade relations.[6] Our paper focuses on negative cross-border effects on FDI, with the channel operating via increased war risk for specific countries in the region.

The remainder of this paper is organized as follows. The next section provides background and develops the hypotheses regarding FDI in Eastern Europe. Section 3 discusses the data and the empirical strategy, while Section 4 presents the baseline findings and explores robustness, channels, and mechanisms. Finally, Section 5 concludes.

2 Background

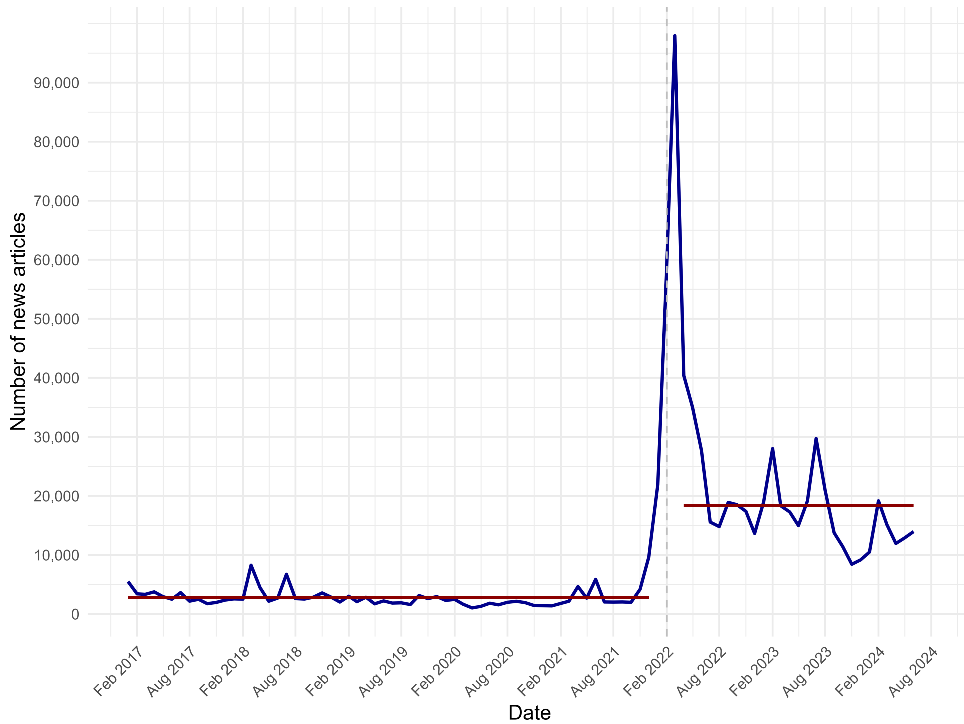
This section discusses the possible impact of Russia's full-scale invasion of Ukraine on greenfield FDI flows to NATO members in Eastern Europe. In the first step, we focus on the relationship between the invasion and the likelihood of a Russia-NATO confrontation in Eastern Europe. The second step considers what a change in this likelihood means for FDI flows to the region.

2.1 Likelihood of a Russia-NATO Confrontation

In his now-famous 2005 annual address to the Russian parliament, President Putin signaled that he viewed the post-Iron Curtain order as temporary and not acceptable (Lukyanov, 2016). Since then, Russia has presented itself as a revisionist power that obstructs economic and democratic progress in its neighborhood and seeks to keep former Soviet republics and Warsaw Pact members in its sphere of influence—or force them back into it. The start of the full-scale invasion of Ukraine in February 2022 can be seen as the most recent escalation in this endeavor. However, it might not be the last one: Arguably, the Ukraine invasion has made a further escalation—a direct Russia-NATO confrontation—more likely. Consistent with this,

[6] In the case of Korovkin and Makarin (2023), the conflict considered is also the one between Russia and Ukraine, but with a focus on an earlier phase, centered on the 2014 annexation of Crimea.

Figure 1: News articles on the Scenario of a Russian Attack on NATO



Notes. This figure is based on data from the LexisNexis electronic database of news articles. It shows the monthly total of news articles using the (English-language) terms "Russian attack" or "Russian military action" (or similar) in connection with "NATO" or "Baltic" (or similar). The vertical dashed line marks the start of the Russian invasion in February 2022. The two horizontal lines indicate the monthly average for the period from January 2017 to December 2021 (2,808 articles) and from April 2022 to June 2024 (18,348 articles), respectively. As an example, consider an article from the *Financial Times* dated April 18, 2024, which reports the following from Estonia: "Hundreds of reinforced bunkers will be built as part of a new defensive line to protect the Baltic states—and by extension the entire western defence alliance—from a Russian attack."

the news media has devoted increased attention to this scenario since the beginning of Russia's full-scale invasion. As Figure 1 shows, the number of news articles on the scenario surged in the early months of 2022 and has remained markedly elevated since.

A possible Russia-NATO confrontation could be inadvertent, arising from misunderstandings or accidental incidents. Or it could result from a tactical attack by Russia, aimed at "coercing NATO to limit or cease support to Ukraine"(Frederick et al., 2023, p. 8). A confrontation along these lines remains a risk as long as Russia's war against Ukraine and NATO's military support for the country continue (Frederick et al., 2023).[7] However, it is also possible that an attack on the alliance's eastern members is just the next step in a broader Russian plan

[7] From February 2022 to June 2024, Ukraine received military aid from NATO countries amounting to more than USD 110 billion, according to the Ukraine Support Tracker by the Kiel Institute for the World Economy.

to restore the Soviet Union's borders and sphere of influence. Considering the current uncertainties regarding the US position on NATO and the European defense deficits, such a scenario is not implausible. In what follows, we analyze what the Russian invasion of Ukraine means for the likelihood of a Russia-NATO confrontation in Eastern Europe under this scenario. To do so, we use the theory of games with incomplete information.

Consider the following strategic situation involving two actors, an aggressor (Russia) and a defender (NATO). The defender can be understood as a military alliance that also includes members whom the aggressor wants to incorporate (Eastern European NATO members). But an attack on the threatened members can only be the second step in a two-stage escalation process. The necessary first step—which, if initiated, will be successful—involves the forced incorporation of another desired country not belonging to the military alliance (Ukraine). This can be due to, for instance, a military or ideological rationale. The defender has two options for responding to the initial escalation step: It can either stand firm by maintaining (or reinforcing) its defensive capabilities in the threatened members; or it can abandon those members to the aggressor. If the defender stands firm, the aggressor can either decide to initiate the second escalation step, a military confrontation with the defender over the threatened members; or it can decide to back down, in which case the threat to the alliance subsides.

The aggressor receives the highest payoff possible when the defender responds to the first escalation step by abandoning the threatened members. Should the defender stand firm, it depends on the aggressor's type whether the payoff associated with further escalation exceeds the payoff associated with backing down. If the former exceeds the latter, the aggressor has a low cost of military confrontation and is therefore referred to as a low-cost type. The aggressor's type is private information, but the defender knows the a priori probabilities and forms a rational belief about the aggressor's type prior to responding to the first escalation step. The strategic interaction is thus marked by incomplete information. For the defender, a military confrontation results in the lowest payoff possible, abandoning the threatened members yields the second lowest, and observing the aggressor back down the third lowest.

Appendix I formalizes this strategic situation and derives the perfect Bayesian equilibrium. In equilibrium, the aggressor initiates the first escalation step with a positive probability, even if it anticipates backing down should the defender stand firm. The reason is that the aggressor's resolve may never be tested: With a positive probability, initiating the first escalation step scares the defender into abandoning the threatened members. Now consider an external observer who understands the strategic situation but does not know the aggressor's type. For such an observer, the initiation of the first escalation step implies an increase in the rational belief about the likelihood of a geopolitical risk materializing—either through a military confrontation between the aggressor and defender or the abandonment of the threatened members. The rational belief does not reach one, however, implying that the observer does not view confrontation or abandonment as inevitable, even after the first escalation step.[8]

In the thematic context of this paper, an example of an external observer is a multinational corporation with a tentative plan to invest in an Eastern European NATO member. According to the above analysis, the start of Russia's full-scale invasion of Ukraine in February 2022 should have led such a company to calculate with a higher likelihood that the planned investment in the region could suddenly be located in a war zone or under Russian control. Still, for the company, this scenario remains an eventuality and does not become a certainty.

2.2 FDI Flows to Eastern European NATO Members

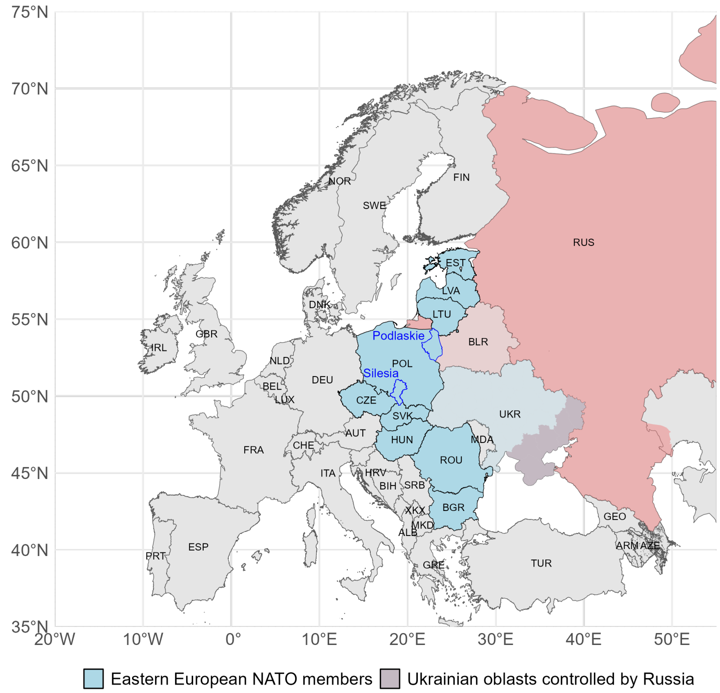
Following the argument above, since February 2022, multinational corporations should account for a higher likelihood of a Russia-NATO confrontation in Eastern Europe—due to a higher risk of inadvertent escalation, since Russia could attack NATO for tactical reasons, or because the invasion can be interpreted as fresh evidence of a Russian plan to reestablish the Soviet Union's sphere of influence. In light of this, it is plausible to expect that multinational corporations now perceive investment locations in Eastern European NATO members as generally less attractive. Still, this broad expectation can be refined by considering the spatial dimension.

Assume that Russia attacks one (or several) of those members. Clearly, such an attack would expose all multinational corporations operating within the territory of the attacked member (or members) to higher expected costs from disruptions and destruction. But it is unlikely that conflict events would be evenly distributed across space: the further an advance into the attacked territory, the more numerous the defensive obstacles to overcome, and thus the lower the success chances.[9] As a result, interstate conflict events are relatively more frequent in areas closer to the border with the aggressor. This pattern is also clearly visible in the current war between Russia and Ukraine (World Bank et al., 2024). Therefore, a Russian attack on NATO would represent the materialization of a geopolitical risk that in expectation is more costly for multinational corporations operating closer to the Russian border than for those farther away. The refined hypothesis is thus as follows: Since February 2022, FDI flows to locations in Eastern European NATO members that are closer to the Russian border—or

[8] This equilibrium has other noteworthy properties. If we interpret the defender's loss from a military confrontation as reflecting the defender's military weakness, then weakness is associated with a higher chance of a geopolitical risk materializing. This is consistent with an old aphorism: "If you want peace, prepare for war".

[9] In the international relations literature, the distance-related decline in the ability for military power projection is known as the "loss-of-strength gradient", originally formulated by Boulding (1962).

Figure 2: Map of Europe



Notes. The coloring of the map reflects that, as of August 2024, five Ukrainian territories (Crimea, Luhansk Oblast, Donetsk Oblast, Zaporizhia Oblast, Kherson Oblast, and Sevastopol) were at least partially under Russian control. The map further reflects that there is a close political and military alliance between Russia and Belarus, with Russia possibly having stationed nuclear weapons in Belarus (Masters, 2023). The Russian attack on Kyiv in the spring of 2022 was launched from Belarus.

to the border of the combined area of Russia and its close ally Belarus—should have slowed more compared to flows to locations farther from Russian influence.

For concreteness, consider Figure 2, a map of Europe. Russia is colored red, and areas over which Russia exerts some control—Belarus and Ukrainian regions currently occupied by Russia—also have a reddish tint. NATO's Eastern European members are colored blue. The map further shows the outlines of two Polish regions, Podlaskie and Silesia. The first region borders Russia and Belarus, while the second is located relatively far away in the southwest of the country. The refined hypothesis states that February 2022 represents a more significant turning point for FDI flows to Podlaskie than for the flows to Silesia. To use more technical language, the rise in expected costs for businesses from a higher risk of a Russia-NATO confrontation is a "treatment" applied in February 2022 to locations in Eastern European NATO members. But since this rise increases with proximity to Russia, the treatment intensity is lower in locations farther from Russia (e.g., Silesia) than in those closer to Russia (e.g., Podlaskie). The expected treatment effect—a reduction in FDI after February 2022—should therefore be more pronounced in the latter than in the former.

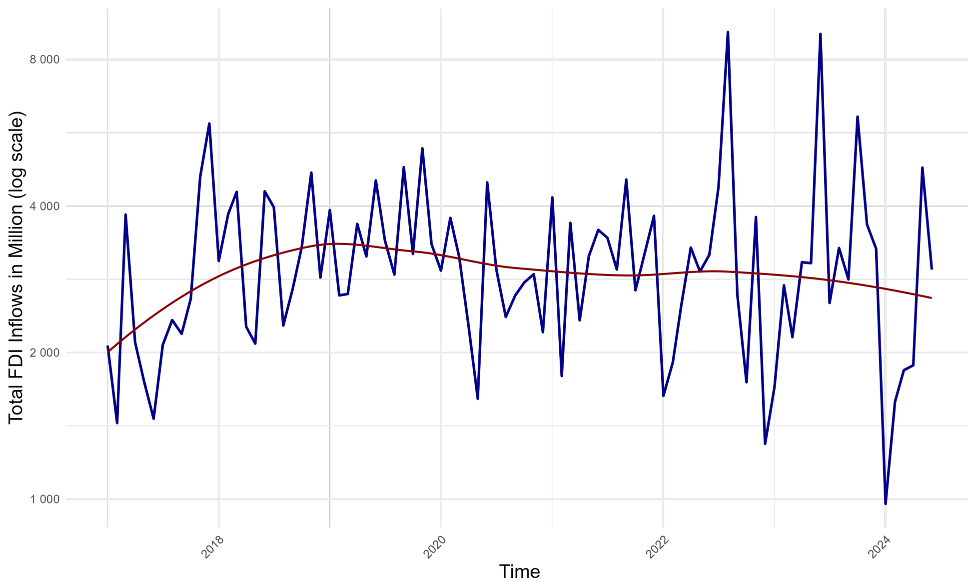
In addition to analyzing aggregate greenfield FDI flows, examining specific subcategories of flows can provide further insights into channels and mechanisms. For example, FDI flows to Eastern European NATO members may be additionally affected by the Western trade sanctions on Russia, gradually tightened in response to the full-scale invasion, as they restrict exports to a neighboring market. These sanctions may also have a stronger impact on the attractiveness of investment locations closer to Russia compared to those farther away. One way to examine the relevance of this alternative channel is to disaggregate FDI into flows financing investment projects with internationally tradable output and those financing projects with non-tradable output. If the trade sanctions do indeed play an important role, the post-February 2022 reduction in FDI by proximity to Russia should be substantially larger for the former than for the latter. Other forms of disaggregation may shed light on specific mechanisms. Are any effects on aggregate FDI flows mainly driven by a decline in new investment projects (extensive margin) or a decline in expansions (intensive margin)? Or are certain groups of source countries particularly responsible for observed effects at the aggregate level? The empirical analysis examines FDI flows disaggregated along all those dimensions.

3 Data and Empirical Strategy

3.1 Data

We use FDI data from fDi Markets, a commercial FDI tracking database run by the "Financial Times" that provides information on more than 200,000 greenfield FDI projects announced by multinational corporations. Greenfield FDI refers to a multinational corporation headquartered abroad setting up new business operations or expanding existing ones, involving capital expenditure and job creation; it does not include mergers and acquisitions. fDi Markets tracks FDI project announcements through comprehensive web scraping algorithms and manually scrutinizes the information by teams of experts. The database is unique in its level of detail, offering two key features that are crucial for our research: The FDI projects are georeferenced at the city level, allowing for spatial analysis; and for each project, the month of announcement is provided, enabling the difference-in-differences approach explained below. Besides capital expenditure, there is additional project information, which includes the origin country and city of the multinational corporation behind a particular project, the project's business cluster and

Figure 3: Monthly FDI Flows to Eastern European NATO Members



Notes. This figure shows the total of monthly greenfield FDI flows to nine Eastern European NATO members: Bulgaria, the Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Slovakia, and Romania. The data are from fDi Markets and cover the period from January 2017 to June 2024. The trend is based on a LOESS fit. Greenfield FDI involves foreign corporations establishing or expanding operations, spending capital and creating jobs; it excludes mergers and acquisitions.

(sub)sector, and the expected number of new jobs created.[10] Due to its richness, the fDi Markets database is increasingly used in academic research (e.g., Doytch et al., 2021; Toews and Vézina, 2022; Bussy and Zheng, 2023; Gopinath et al., 2025), and it is now a standard source for institutions such as the International Monetary Fund, the World Bank, and UNCTAD—which itself is a provider of widely used FDI data (Toews and Vézina, 2022).[11]

We have access to information on about 21,500 investment projects in Eastern European NATO members, covering the period from January 2003 to June 2024. These projects originate from multinational corporations headquartered all around the world. Figure 3 shows the total of monthly FDI flows to the Eastern European NATO members from January 2017 to June 2024, the period on which our analysis focuses. Almost all monthly FDI flows fall within the range between one and eight billion US dollars. Figure 7 in Appendix III displays the geographic distribution of projects during our observation period, additionally indicating for each whether

[10] A typical entry in the database looks as follows. Destination country/city: Latvia/Riga – Project year/month: 2019/09 – Source country/city: US/Beaverton (OR) – Cluster/sector/subsector: retail trade/textiles/footware – Project type: new – Capital expenditure: USD X.X million – Jobs created: XX.

[11] Toews and Vézina (2022) aggregate fDi Markets data at the country-year level and compare it to UNCTAD FDI data. The appropriate UNCTAD comparison metric is gross FDI inflows, as fDi Markets does not account for divestment. The comparison shows a high correlation and no systematic differences between the data sources.

Table 1: Summary Statistics

Panel A: District Level	N	Median	Mean	St. Dev.	Min	Max
ln(FDI)	458,730	0.00	0.15	1.61	0.00	22.74
No. FDI Projects	458,730	0	0.02	0.24	0	20
Distance Russia (in km)	458,730	1,280.82	1,132.55	569.34	8.01	2,100.91
Distance Ukraine (in km)	458,730	327.53	408.19	301.11	5.24	1,337.95
Distance Russian Influence (in km)	458,730	857.86	796.12	405.49	8.01	1,893.71
Distance Beeline Russia (in km)	458,730	896.36	774.87	353.86	4.96	1,400.29
Proximity Russia (in 100 km)	458,730	8.20	9.68	5.69	0.00	20.93
Proximity Ukraine (in 100 km)	458,730	10.10	9.30	3.01	0.00	13.33
Proximity Russian Influence (in 100 km)	458,730	10.36	10.98	4.05	0.00	18.86
Proximity Beeline Russia (in 100 km)	458,730	5.04	6.25	3.54	0.00	13.95
Panel B: Cell 0.25° × 0.25° Level						
ln(FDI)	233,010	0.00	0.29	2.22	0.00	22.74
No. FDI Projects	233,010	0	0.03	0.34	0	20
Distance Russia (in km)	233,010	711.33	811.60	592.92	11.32	2,083.59
Distance Ukraine (in km)	233,010	491.55	517.55	308.67	11.09	1,332.26
Proximity Russia (in 100 km)	233,010	13.72	12.72	5.93	0.00	20.72
Proximity Ukraine (in 100 km)	233,010	8.41	8.15	3.09	0.00	13.21

Notes. The data form a balanced panel with one observation per district or cell per month-year combination for the period from January 2017 to June 2024. FDI is measured in millions of USD. No. FDI projects is measured as a simple count of individual projects. The term "distance" refers to road distance to the nearest border checkpoint. The term "beeline distance" refers to Euclidean (straight-line) distance to the nearest border checkpoint. The term "Proximity" refers to an inverse measure of road or beeline distance: (beeline) distance of the most distant spatial unit (district or cell) minus (beeline) distance of the spatial unit under consideration. The term "Russian influence" refers to the combined area of Russia and Belarus.

it was announced before or after the start of Russia's 2022 invasion of Ukraine.

To calculate proximity to Russia, we use GIS data such as geoBoundaries for administrative boundaries and Open Street Maps for the underlying road network. The GIS data are used to calculate the road distance to the nearest Russian border checkpoint for each geographic location (at the level of districts and grid cells) in the combined area of the Eastern European NATO members. Information on the location of border checkpoints comes from various governmental sources.[12] The distances are calculated as the mean road distance from 20 randomly chosen points within a polygon to the nearest Russian border checkpoint, with a polygon defined as either a district (ADM2—second administrative level), a 0.25° × 0.25° grid cell (about 27.75 km × 27.75 km at the equator), or a 0.5° × 0.5° grid cell (about 55 km × 55 km at the equator). Using road distance ensures that we capture actual proximity to Russia—accounting for natural barriers to a possible invasion, such as mountain ranges, lakes, and rivers. To explore robustness and channels, we also calculate, using the same method, a location's distance to the nearest border checkpoint with the combined area of Russia and Belarus ("Russian influence") and to the nearest border checkpoint with Ukraine.

Table 1 shows the summary statistics for the variables of interest, separately for districts (Panel A) and the 0.25° × 0.25° grid cells (Panel B). Figures 8, 9, and 10 in Appendix III

[12] These governmental sources are complemented by our own additional search of locations of border institutions visible via satellite images. The locations' coordinates come from Google Maps.

show the boundaries of the districts, the 0.25° × 0.25° grid cells, and the 0.5° × 0.5° grid cells, respectively. Figure 11 in Appendix III shows the locations of border checkpoints into Eastern European NATO members from Russia, Belarus, and Ukraine. And in Figure 12 of the same appendix, a 569 km buffer zone around Russia is delineated, with 569 km corresponding to one standard deviation of the road distance to the nearest Russian border checkpoint.

3.2 Empirical Strategy

Our empirical analysis rests on a difference-in-differences design with continuous treatment intensity. We use Russia's full-scale invasion of Ukraine as an exogenous shock to a location's attractiveness for FDI. The treatment is then the post-February 2022 rise in expected costs from geopolitical risk—specifically, the risk of a Russia-NATO confrontation—for multinational corporations planning to invest in an Eastern European NATO member, with proximity to Russia capturing treatment intensity. We consider the five-year period from January 2017 to January 2022 as the pre-treatment period; February 2022 marks the beginning of the treatment period, which extends to June 2024, the most recent observation.

To test our main hypothesis, we follow what has so far been the standard approach in the literature (see, e.g., Korovkin and Makarin, 2023) and use the linear two-way fixed effects model

$$\ln(FDI_{dct}) = \beta\, Prox_d \cdot Post_t + \delta_d + \zeta_c + \eta_t + \epsilon_{dct}, \tag{1}$$

where FDI_{dct} refers to greenfield FDI flows to district d in country c announced at year-month t; $Prox_d$ is an inverse measure of the road distance between district d and its nearest Russian border checkpoint; $Post_t$ is the post-invasion dummy that indicates all year-months in the treatment period; δ_d, ζ_c, and η_t are district, country, and year-month fixed effects; and ϵ_{dct} is the error term.[13] The coefficient of interest is β. Insofar as the treatment effect is linear in proximity to Russia, and FDI flows to locations with different proximities would have followed the same trend absent the post-February 2022 treatment, β captures the treatment's differential effect on FDI flows according to a location's road proximity to Russia. We address the question of pre-treatment trends in Subsection 4.1.

Throughout the analysis, we use two different measures of proximity to Russia, one continuous and the other binary. The continuous measure consists of the difference in road distance to the nearest Russian border checkpoint between the most distant district and the district under consideration: $Prox_d$ (continuous) $= distance^m - distance_d$, where the distance to Russia from

[13] $Prox_d$ and $Post_t$ do not individually enter model (1), as they are taken care of by δ_d and η_t, respectively. Cell fixed effects are added when model (1) is estimated at the grid cell rather than district level.

the most distant district, $distance^m$, is 2101 km and $distance_d$ refers to district d's distance in km to Russia. As a result, the measure $Prox_d$ (continuous) indicates how much closer district d is to Russia compared to the most distant district. The binary measure is a dummy variable that indicates whether the road distance to the nearest Russian border checkpoint is below or above the mean: $Prox_d$ (dummy) = 1 if district d's distance to Russia is less than the mean distance, and $Prox_d$ (dummy) = 0 otherwise.[14]

Future work will follow the most recent literature on difference-in-differences designs with continuous treatment intensity (see, e.g., Callaway et al., 2024) and employ a non-parametric estimation method that does not rely on the linearity assumptions inherent in model (1). The method relies on a clearly stated parallel trends assumption extended to the case of continuous treatment for the estimation of average treatment effects on the treated; and on a strong parallel trends assumption for the estimation of average treatment effects.

4 Results

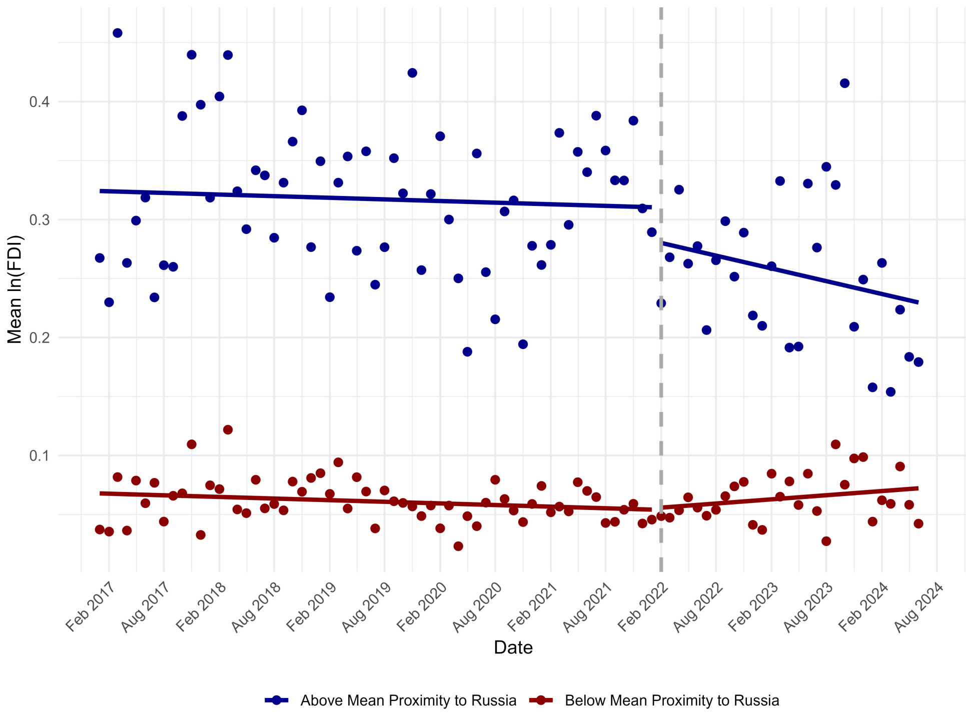
4.1 Descriptive Results

Figure 4 provides a first impression of how FDI flows to Eastern European NATO members changed after the start of Russia's invasion of Ukraine in February 2022. The figure shows the mean monthly FDI inflow (in logs) at the district level, distinguishing between districts with above-mean—$Prox_d$ (dummy) = 1—and below-mean—$Prox_d$ (dummy) = 0—proximity to Russia. Two patterns emerge clearly from the figure. First, before the start of the invasion, there is no difference in the trend of FDI inflows between the two groups: Both groups exhibit the same slightly negative trend from January 2017 to January 2022. Second, after the start of the invasion in February 2022, the trend for the above-mean proximity group turns considerably negative, while the trend for the other group changes only marginally. The figure thus suggests parallel pre-trends and that FDI flows to Eastern European NATO locations were differentially affected by Russia's attack, depending on their proximity to Russia.

Before quantifying the effect using a difference-in-differences approach in the next subsection, we present the results of a flexible event-study specification. The only difference from model (1) is that we interact the (binary) proximity variable with indicators for a total of 14 consecutive half-years (nine before February 2022 and five after), using the half-year from February 2017 to July 2017 as the reference period. The estimation of this specification gen-

[14] We follow the same approach when working with grid cells instead of districts, beeline distance instead of road distance, and "Russian influence" or Ukraine instead of Russia.

Figure 4: Parallel Trends before February 2022—Raw Data

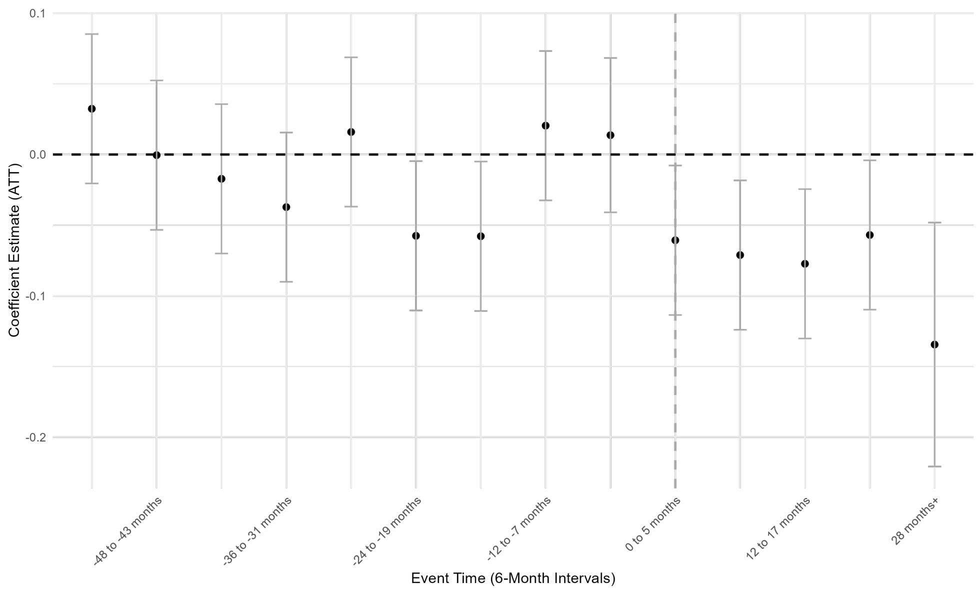


Notes. The figure shows the monthly mean of $\ln(FDI + 1)$ over the observation period from January 2017 to June 2024, separately for districts with above-mean and below-mean proximity to Russia. The vertical dashed line marks the start of the Russia's full-scale invasion of Ukraine in February 2022. The colored lines represent the corresponding linear trend before and after February 2022.

erates 14 coefficients, with the coefficients indicating the extent to which differences in FDI inflows relative to the reference period depend on proximity to Russia. If proximity to Russia only became an important determinant with the start of the invasion, we would expect the first nine coefficients to not be significantly different from zero, and the following five to be significantly negative. Figure 5 shows the results as an event-study graph. The pattern in the figure largely aligns with this expectation. With the exception of two, the estimates for the half-years before February 2022 are not significantly different from zero, while all estimates for the half-years from February 2022 onward are significantly negative.[15] Overall, the pattern in Figure 5 is consistent with the message from Figure 4: There is no evidence of a systematic difference in FDI trends by proximity before February 2022—which is the identifying assumption underlying the difference-in-differences estimates presented in the next subsection.

[15]The two exceptions pertain to the first two half-years of the COVID-19 pandemic, during which FDI flows to above-mean proximity districts declined somewhat more than those to below-mean proximity districts.

Figure 5: Proximity to Russia and FDI Inflows—Event Study



Notes. This figure shows estimation results based on an event-study design. It indicates the differences in FDI inflows between districts with above-mean and below-mean proximities to Russia before and after the start of Russia's full-scale invasion of Ukraine in February 2022. For the estimation, the monthly FDI flows are pooled into adjacent half-year bins, with the first half-year bin in the treatment period covering the months from February 2022 to August 2022. (The final bin consists of only five months.) The half-year from February 2017 to July 2017 is used as a reference period. The estimates are based on a TWFE estimator including country, district, year, and month-year fixed effects. The vertical dashed line marks the start of the Russian invasion. The figure also shows 95 percent confidence intervals based on standard errors clustered at the district level.

4.2 Empirical Results

4.2.1 Baseline

Table 2 presents our baseline estimates using model (1). The main spatial unit of analysis is the district. Column (1) of Table 2 reports the result for the continuous proximity measure, with proximity entering the regression equation in 100 km units. Consistent with our main hypothesis, the interaction coefficient β—which captures the treatment's differential effect by proximity to Russia—is negative and significant at the 1 percent level. To get a sense of the magnitude of the effect, we compare two otherwise similar districts, with the first being 569 km (one standard deviation at the district level) closer to Russia in terms of road distance than the second. The estimate in Column (1) suggests that the negative impact of Russia's 2022 Ukraine invasion on FDI flows to the first district exceeds that on FDI flows to the second district by 2.6 percentage points. The result in Column (2), which is based on the binary measure, confirms

Table 2: Baseline Results at District Level

	Dependent variable: ln(FDI)	
	(1)	(2)
Prox (continuous) * post-February 2022	-0.0045***	
	(0.0008)	
Prox (dummy) * post-February 2022		-0.0653***
		(0.0107)
District FE	✓	✓
Country FE	✓	✓
Year-Month FE	✓	✓
No. of Districts	5097	5097
Dep. var. mean	0.151	0.151
Dep. var. std. dev.	1.607	1.607
Observations	458,730	458,730

Notes: The standard errors in parentheses are clustered at the district level. All estimations are TWFE models with the indicated fixed effects. The dependent variable, FDI flows, is transformed using a log-transformation with a shift of one: $FDI \rightarrow \ln(FDI + 1)$. Prox (continuous) measures in units of 100 km of road distance how much closer a district is to Russia compared to the most distant district. Prox (dummy) is a dummy variable that indicates whether proximity to Russia is above or below the mean. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

the adverse influence of proximity to Russia: The interaction coefficient is again negative and significant at the 1% level. The estimate suggests that the 2022 Ukraine invasion reduced FDI flows to a district with above-mean proximity to Russia by 6.5 percentage points compared to an otherwise similar below-mean district.

To see what this means in absolute terms, note that in the observation period the average district received FDI inflows of USD 620.2 thousand per month; 2.6 percentage points (continuous measure) of that corresponds to USD 16.1 thousand. Extrapolated to a full year and the average number of districts in Eastern European NATO countries (566), this amounts to USD 110 million. By comparison, the average country receives USD 4.2 billion in greenfield FDI inflows per year. Considering that this differential effect pertains to a flow variable at the annual level, it is economically significant.[16]

4.2.2 Robustness

To assess the robustness of the baseline results, we proceed with a series of additional estimates. Table 3 presents estimates for two alternative spatial units of analysis: grid cells of size $0.25^{\circ} \times 0.25^{\circ}$ and $0.5^{\circ} \times 0.5^{\circ}$; to facilitate comparison, Columns (1) and (2) repeat the baseline estimates using districts. Table 3 confirms the previous results: The interaction coefficients remain consistently negative and significant, regardless of the choice of spatial unit. Consider now the effect sizes implied by the analysis based on the $0.25^{\circ} \times 0.25^{\circ}$ grid cells—the next

[16] It should also be noted that this number is based on changes in FDI inflows only. In particular, it does not account for any potential differential effect on divestment (i.e., divestment increasing in proximity to Russia).

Table 3: Alternative Spatial Units of Analysis

	Dependent variable: ln(FDI)					
	Districts		$0.25° \times 0.25°$ cells		$0.5° \times 0.5°$ cells	
	(1)	(2)	(3)	(4)	(5)	(6)
Prox (continuous) * post-February 2022	-0.0045***		-0.0036***		-0.0125***	
	(0.0008)		(0.0011)		(0.0038)	
Prox (dummy) * post-February 2022		-0.0653***		-0.0371**		-0.1369**
		(0.0107)		(0.0168)		(0.0578)
District FE	✓	✓	✓	✓	✓	✓
Cell FE			✓	✓	✓	✓
Country FE	✓	✓	✓	✓	✓	✓
Year-Month FE	✓	✓	✓	✓	✓	✓
No. of Districts	5097	5097				
No. of $0.25° \times 0.25°$ cells			2589	2589		
No. of $0.5° \times 0.5°$ cells					730	730
Dep. var. mean	0.151	0.151	0.291	0.291	0.968	0.968
Dep. var. std. dev.	1.607	1.607	2.222	2.222	3.978	3.978
Observations	458,730	458,730	233,010	233,010	65,700	65,700

Notes: The standard errors in parentheses are clustered at the district or the corresponding cell level. All estimations are TWFE models with the indicated fixed effects. The dependent variable, FDI flows, is transformed using a log-transformation with a shift of one: $FDI \rightarrow \ln(FDI + 1)$. Prox (continuous) measures in units of 100 km of road distance how much closer a district is to Russia compared to the most distant district. Prox (dummy) is a dummy variable that indicates whether proximity to Russia is above or below the mean. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

larger units after districts, and on average about twice their size. It is directly evident that the estimates based on the binary proximity measure in Columns (4) and (2) suggest a somewhat smaller effect size when the analysis is conducted using the grid cells. To illustrate the effect size implied by the estimate based on the continuous measure in Column (3), we again compare two otherwise similar cells that are one standard deviation apart in proximity to Russia (593 km at the $0.25° \times 0.25°$ level): The cell closer to Russia experienced a negative impact that is 2.1 percentage points larger than that of the more distant cell—only slightly below the 2.6 percentage points suggested by the baseline estimate in Column (1).

Table 4 returns to the district as the spatial unit of analysis, but uses alternative measures of proximity: beeline proximity to Russia and road proximity to "Russian influence"—the combined area of Russia and Belarus, the latter being a close Russian military ally. As in the previous robustness check, the point estimates remain consistently negative and significant. Moreover, the estimates based on beeline distance to Russia in Columns (3) and (4) imply essentially identical effect sizes. This is again directly evident in the estimates based on the binary proximity measure. For the continuous proximity measure, the beeline point estimate is larger. However, when we calculate the effect of a one-standard-deviation increase in proximity to Russia based on the beeline measure (354 km compared to 569 km), the result is identical to the baseline result: The closer district faces a negative impact that is larger by 2.6 percentage points than the more distant district. While underscoring the robustness of the baseline results, this similarity may suggest that the geography of Eastern Europe does not produce large gaps

Table 4: Alternative Proximity Measures

	Dependent variable: ln(FDI)					
	Road RUS		Beeline RUS		Road RUS, BLR combined	
	(1)	(2)	(3)	(4)	(5)	(6)
Prox (continuous) * post-February 2022	-0.0045***		-0.0074***		-0.0047***	
	(0.0008)		(0.0013)		(0.0010)	
Prox (dummy) * post-February 2022		-0.0653***		-0.0712***		-0.0325***
		(0.0107)		(0.0118)		(0.0093)
District FE	✓	✓	✓	✓	✓	✓
Year-Month FE	✓	✓	✓	✓	✓	✓
Country FE	✓	✓	✓	✓	✓	✓
No. of Districts	5097	5097	5097	5097	5097	5097
Dep. var. mean	0.151	0.151	0.151	0.151	0.151	0.151
Dep. var. std. dev.	1.607	1.607	1.607	1.607	1.607	1.607
Observations	458,730	458,730	458,730	458,730	458,730	458,730

Notes: The standard errors in parentheses are clustered at the district level. All estimations are TWFE models with the indicated fixed effects. The dependent variable, FDI flows, is transformed using a log-transformation with a shift of one: $FDI \rightarrow \ln(FDI + 1)$. Prox (continuous) measures in units of 100 km how much closer a district is—compared to the most distant district—to: Russia by road distance (Columns 1 and 2); Russia by beeline distance (Columns 3 and 4); the combined area of Russia and Belarus by road distance (Columns 5 and 6). Prox (dummy) is a dummy variable that indicates whether proximity is above or below the corresponding mean. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

between road and beeline proximity. When the estimates are based on proximity to "Russian influence", as in Columns (5) and (6), the effect size is somewhat smaller. As before, this is directly evident in the estimates based on the binary proximity measure; in the case of the continuous measure, this becomes apparent once one accounts for the lower standard deviation of proximity to the combined area (405 km compared to 569 km).[17] The smaller effect sizes may indicate that investors believe an attack in the event of a Russia–NATO confrontation would be more likely to originate directly from Russia rather than from Belarus.

Table 7 in Appendix II returns to road proximity to Russia to capture treatment intensity, but presents estimates with additional fixed effects. In Columns (3) and (4), country-month fixed effects are added to account for potential country-specific seasonal patterns that repeat every year. Columns (5) and (6) add country-year fixed effects to the baseline specification, thereby controlling for country-specific shocks that vary at the annual level. As the table shows, the baseline estimates are highly robust to the inclusion of country-month fixed effects. This is not the case with the country-year fixed effects, which essentially absorb much of the shock we exploit. Specifically, these fixed effects capture shocks that are common to all districts in a given country and year (e.g., to Lithuania in 2022). However, the increase in geopolitical risk after February 2022 does not exhibit much variation within a given year, and our country sample includes a set of small countries within which the variation in distance to Russia is less

[17] As Figure 11 in Appendix III illustrates, including Belarus adds additional border crossings into the combined area of the nine Eastern European NATO members—at the borders with Latvia, Lithuania, and especially Poland. The additional crossings into Poland increase proximity especially for the more southern members.

pronounced. Therefore, adding country-year fixed effects to the baseline specification leaves only limited within-year and within-country variation to identify an effect.

Rather than exploring modifications on the right-hand side of the fixed effects model (1), Table 8 in Appendix II focuses on the left-hand side. Columns (3) and (4) are based on an alternative transformation of the dependent variable: the inverse hyperbolic sine (IHS) transformation, as opposed to the logarithmic transformation. As the table shows, the IHS transformation leads to results that are essentially identical to the baseline results. In Columns (5) and (6), the dependent variable is the simple count of new projects received by a district per month, as opposed to the logarithm of the total monthly USD value. Once again, the point estimates are negative and highly statistically significant for both the continuous and binary proximity measures. To get a sense of the magnitude, we compare two districts that had the same average number of projects prior to February 2022 and are also otherwise similar—except that the first is one standard deviation closer to Russia than the second. The estimate in Column (5) suggests that the district closer to Russia experienced an approximately ten-percentage-point larger fall in project numbers than the more distant one.[18]

Finally, Table 9 in Appendix II presents estimates in which one Eastern European NATO member is omitted in each of the columns. Panel A uses the continuous proximity measure, while Panel B uses the binary measure. The table shows that the baseline results are highly robust to this type of jackknife analysis. The estimates are consistently negative, comparable in magnitude to those in Table 2, and statistically significant at the 1% level in almost all cases. Only when Romania's 3,235 districts are omitted, significance drops to the 10% level. The results remain robust even when all three Baltic states, often described as particularly threatened by Russia, are excluded simultaneously. As Table 10 in Appendix II shows, the point estimates remain negative and highly significant—and become even larger in absolute size.

4.2.3 Channels

We now examine the possibility that the baseline results are driven by channels other than the reassessment of geopolitical risk. One alternative channel is that multinational corporations may seek to scale back investments near active combat zones.[19] For this reason, we estimate another regression equation that controls not only for proximity to Russia but also for proximity to Ukraine. The results are presented in Table 5, with Column (1) based on the continuous

[18] The average number of projects is 0.016, and the differential effect in absolute terms is –0.00171 projects. Combined, these two figures imply the approximately ten-percentage-point difference referred to above.

[19] Russian missiles and drones have repeatedly struck NATO territory neighboring Ukraine. Whether this has happened by mistake or as a deliberate provocation is hard to say.

Table 5: Controlling for Proximity to Ukraine

	Dependent variable: ln(FDI)	
	Proximity Continuous	Proximity Dummy
	(1)	(2)
Prox (RUS) * post-February 2022	-0.0049***	
	(0.0010)	
Prox (UKR) * post-February 2022	-0.0013	
	(0.0017)	
Prox (RUS) * post-February 2022		-0.0622***
		(0.0116)
Prox (UKR) * post-February 2022		0.0087
		(0.0102)
District FE	✓	✓
Country FE	✓	✓
Year-Month FE	✓	✓
No. of Districts	5097	5097
Dep. var. mean	0.151	0.151
Dep. var. std. dev.	1.607	1.607
Observations	458,730	458,730

Notes: The standard errors in parentheses are clustered at the district level. All estimations are TWFE models with the indicated fixed effects. The dependent variable, FDI flows, is transformed using a log-transformation with a shift of one: $FDI \rightarrow \ln(FDI + 1)$. Proximity Continuous measures in units of 100 km of road distance how much closer a district is to Russia (RUS)/to Ukraine (UKR) compared to the most distant district. Proximity Dummy is a dummy variable that indicates whether proximity to RUS/to UKR is above or below the mean. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

proximity measures and Column (2) on the discrete ones. In both columns, the interaction coefficients for proximity to Ukraine are not significantly different from zero, while the estimated effects of proximity to Russia remain essentially unchanged compared to the baseline results. Thus, proximity to active fighting does not appear to be an independent reason for multinational corporations to avoid potential FDI locations.

The sanctions regime against Russia creates a second alternative channel. Western countries have gradually tightened trade sanctions on Russia since the start of the full-scale invasion of Ukraine. This may reduce FDI flows to Eastern European NATO members by lowering the profitability of investment projects that produce export goods for the Russian market. The trade sanctions may also have a stronger impact on the attractiveness of investment locations closer to Russia compared to those farther away. One way to examine this is to disaggregate FDI into flows financing investment projects with internationally tradable output and those financing projects with non-tradable output.[20] If the tightened trade sanctions do indeed play an important role, the post-February 2022 reduction in aggregate FDI should be primarily driven by the former. Table 6 examines whether this is actually the case. The table

[20] A good is non-tradable when its nature or transport costs restrict the customer base to the local, regional, or national market. In practice, there is no strict dichotomy. We thus follow the pragmatic standard approach and classify a project as one with non-tradable output if the fDi Markets categorization by cluster/sector/sub-sector suggests that it belongs to the service sector, the retail trade sector, the real estate sector, or the utilities sector.

Table 6: Differentiating by Tradability

	Dependent variable:					
	ln(FDI)		ln(FDI tradable)		ln(FDI non-tradable)	
	(1)	(2)	(3)	(4)	(5)	(6)
Prox (continuous) * post-February 2022	-0.0045***		-0.0028***		-0.0022***	
	(0.0008)		(0.0006)		(0.0006)	
Prox (dummy) * post-February 2022		-0.0653***		-0.0379***		-0.0333***
		(0.0107)		(0.0087)		(0.0078)
District FE	✓	✓	✓	✓	✓	✓
Country FE	✓	✓	✓	✓	✓	✓
Year-Month FE	✓	✓	✓	✓	✓	✓
No. of Districts	5097	5097	5097	5097	5097	5097
Dep. var. mean	0.151	0.151	0.083	0.083	0.09	0.09
Dep. var. std. dev.	1.607	1.607	1.18	1.18	1.241	1.241
Observations	458,730	458,730	458,730	458,730	458,730	458,730

Notes: The standard errors in parentheses are clustered at the district level. All estimations are TWFE models with the indicated fixed effects. The dependent variables are transformed using a log-transformation with a shift of one, for example, $FDI \rightarrow \ln(FDI + 1)$. FDI tradable (non-tradable) includes FDI flows financing investment projects with internationally (non-)tradable output. A project is classified as one with non-tradable output if the fDi Markets categorization by cluster/sector/sub-sector suggests that it belongs to the service sector, the retail trade sector, the real estate sector, or the utilities sector. Prox (continuous) measures in units of 100 km of road distance how much closer a district is to Russia compared to the most distant district. Prox (dummy) is a dummy variable that indicates whether proximity to Russia is above or below the mean. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

presents separate estimates for flows financing projects with tradable and non-tradable output; to facilitate comparison, Columns (1) and (2) repeat the baseline estimates using aggregate flows. An initial observation is that the estimated coefficients for the disaggregated FDI flows remain negative and highly statistically significant—for both proximity measures; the new estimates are, however, somewhat smaller in absolute terms relative to the baseline.[21] But how do the estimates for the flows financing projects with tradable and non-tradable output compare to each other? Table 6 shows that they are very similar: Although the estimates for the "tradable flows" suggest a slightly larger effect than those for the "non-tradable flows", the differences remain small—a result that holds for both proximity measures. Thus, the negative consequences of proximity to Russia that materialized after February 2022 are of about the same magnitude for "tradable flows" and "non-tradable flows". This suggests that the tightening of the Western trade sanctions is not a quantitatively important reason why multinational corporations started to avoid proximity to Russia.

Beyond its potential indirect impact through trade, the sanctions regime against Russia could also have a more direct effect on FDI flows to Eastern Europe. In particular, the European Union's (EU) tightening of sanctions after February 2022 included an increase in the barriers to FDI from Russia into the EU (to which all Eastern European NATO members belong). The new barriers consist of tighter screening of FDI from Russia by EU member states, as

[21] Since the FDI flows are log-transformed, the coefficients reflect the relative change due to increased geopolitical risk. This allows for a direct comparison of coefficient sizes for aggregated and disaggregated FDI flows.

well as of broader financial sanctions that restrict financial ties between entities in the EU and Russia. To examine whether this type of sanctions tightening contributes to the baseline results, we estimate model (1) using FDI flows to Eastern European NATO members that exclude investments from Russia. The results are presented in Table 11 in Appendix II and are essentially identical to the baseline results. Thus, we conclude that there is no evidence that this potential direct effect of tighter sanctions is sufficiently strong to affect our baseline results.

4.2.4 Mechanisms

The comprehensive nature of the fDi Markets data also allows us to shed light on the mechanisms behind the reduction in FDI flows. In particular, we can assess whether the overall effect is primarily driven by declining FDI flows into new projects (extensive margin) or expansions of existing ones (intensive margin). To examine this, we disaggregate FDI into flows financing new projects and those financing expansions of existing ones, and then separately estimate model (1) using these disaggregated flows. The results are presented in Table 12 in Appendix II. For both types of FDI flows, the point estimates remain negative and highly statistically significant—both for the continuous and the binary proximity measure. However, the estimates for the flows into new projects are about twice as large (in absolute magnitude) as the estimates for the flows into expansion projects. The aggregated negative effect is therefore driven more by the extensive margin than by the intensive margin. This may reflect the fact that, at the planning stage, an increase in the likelihood of a Russia–NATO confrontation does less damage to the expected return on an expansion investment than to that on a completely new project: All else equal, expansions can often be realized more quickly, generating income streams that begin closer to the start of the investment. As a result, compared to a new project of similar size, a larger share of expected income may already be realized by the time a future risk materializes, making the expected return on expansion investments less sensitive to changes in geopolitical risk. An increase in the likelihood of a Russia–NATO confrontation should thus be expected to have a smaller effect on the location choice of expansion projects than on that of new investments—consistent with what we find in the data.

Shifting the focus to the origin of FDI flows, we observe that a large share of total investment comes from the EU & EFTA (62%) and an even larger share from allied countries (92%), with the former group being a subset of the latter.[22] When we estimate model (1) using only FDI flows from either the narrower group of EU & EFTA countries or the broader group of

[22] Here, EU & EFTA includes the United Kingdom. Allied countries refers to the group of countries that voted "yes" on UN Resolution A/RES/ES-11/1, which deplores the aggression by Russia against Ukraine.

allied countries, the results are essentially identical to the baseline findings. The results based on these restricted samples are shown in Table 13 in Appendix II. Given the quantitative dominance of FDI flows from the EU & EFTA and allied countries beyond that group, and given the similarity of the results in Table 13 to the baseline results, we conclude that it is primarily multinational corporations from these countries that drive the baseline findings. The latter, therefore, can be interpreted as reflecting a reassessment of geopolitical risk by Western multinationals (and those from aligned countries).

5 Conclusion

Rising geopolitical tensions are increasingly leaving their mark on cross-border trade and investment flows, fragmenting international commerce along the boundaries of geopolitical blocs. This paper shows that heightened tensions, beyond making bloc boundaries less permeable, can also have adverse effects within blocs, particularly at the periphery. Arguably, with the start of Russia's full-scale invasion of Ukraine in February 2022, the risk of a Russia-NATO confrontation in Eastern Europe has risen. We now provide evidence of a negative impact on FDI flows to Eastern European NATO members, with the strength of the effect significantly increasing with proximity to Russia. Thus, since February 2022, multinational corporations have been more strongly avoiding areas within the Western bloc that are more likely to be directly affected by a confrontation due to their proximity and quick accessibility from Russia. In our view, the indication that multinational companies are sensitive to location-specific geopolitical risk is of relevance beyond the European context. For example, it suggests that US allies in the Indo-Pacific region should prepare for the possibility that a sudden increase in the likelihood of a military confrontation over Taiwan could reduce FDI inflows.

Taking advantage of the granularity of the FDI data, we also show that our baseline results are robust to various modifications and unlikely to be driven by alternative channels—such as firms avoiding proximity to active combat zones or facing additional trade barriers due to the tightened Western sanctions on Russia. With regard to underlying mechanisms, we find that the identified negative effects are largely attributable to a reduction in investment flows from "Western" countries into new projects (as opposed to expansion projects). Still, there are various ways to refine the results presented here. From a methodological perspective, it seems worthwhile to also present estimates based on a non-parametric difference-in-differences procedure that does not assume linearity of effects in treatment intensity. From a substantive perspective, it would be valuable to provide further support for the conclusion that, after February 2022, multinational corporations more strongly avoid locations closer to Russia because the reassessment of geopolitical risk was more pronounced for those locations. An approach could be to examine whether the weight of geopolitical risk considerations in conference calls of multinational corporations with operations in Eastern European NATO members increased more strongly for those with operations located closer to Russia. Pursuing these methodological and substantive refinements is a promising direction for future research.

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Appendix I

Formal Analysis of the Strategic Situation

A.1 Representation and Equilibrium

The strategic situation introduced in Subsection 2.1 translates into the game tree visualized by Figure 6. The aggressor and the defender are denoted by A and D, respectively. Nature, N, decides the type of the aggressor, which can either be low cost or high cost: $T \in \{l, h\}$. The a priori probabilities are given by λ and $1-\lambda$, respectively, where $\lambda < 1/2$. A first decides whether or not to initiate the first escalation step: $E1 \in \{n, y\}$, where n indicates a decision against. Following $E1 = y$, D forms a belief q about the probability of $T = l$ conditional on $E1 = y$. Given q, D then decides whether or not to stand firm: $F \in \{n, y\}$. Following $F = y$, A decides whether or not to initiate the second escalation step: $E2 \in \{n, y\}$.

The first line at the bottom of the figure shows the payoffs for A, while the second line shows the payoffs for D. If A is a low-cost type, $E2 = y$ results in a payoff of $-\alpha^l$ for A, where $\alpha^l < 1$; otherwise, $E2 = y$ leads to a payoff of $-\alpha^h$, where $\alpha^h > 1$. The corresponding payoff for D is non-random: $-\delta$, where $\delta > 2$. The numerical values for the payoffs following an initial escalation ($E1 = y$), along with the parameters α^l, α^h, and δ, and the restriction on them, are chosen to reflect the payoff structure described in Subsection 2.1. The payoffs associated with the absence of escalation ($E1 = n$) are normalized to 0. We further assume

$$\delta < \frac{1+\lambda}{\lambda}, \tag{A1}$$

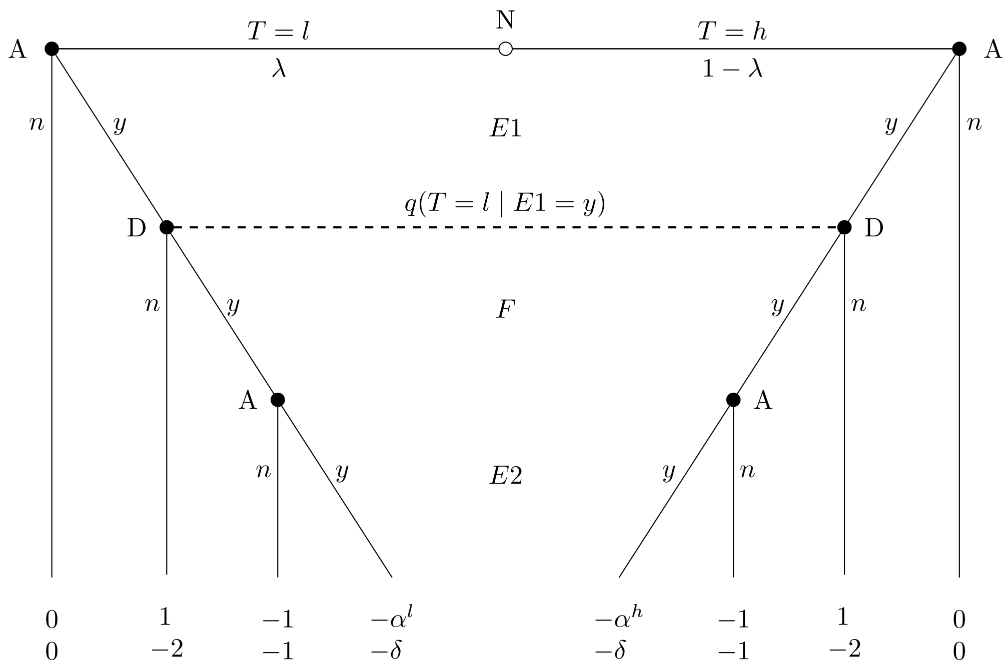
a constraint that ensures that D's payoff from a military confrontation ($E2 = y$, $F = y$, $E2 = y$) is not so low that D always abandons the threatened members.

PROPOSITION 1. *Suppose that constraint (A1) holds. Then, the game shown in Figure 6 has a perfect Bayesian equilibrium in which:*

- *Aggressor A initiates the first escalation step ($E1 = y$) with probability 1 if it is of the low-cost type ($T = l$); and it initiates the first escalation step with probability $p^A = \lambda(1-\lambda)^{-1}(\delta - 2) < 1$ if it is of the high-cost type ($T = h$).*

- *Defender D responds to $E1 = y$ by adopting a posterior belief $q(T = l \mid E1 = y) = (\delta - 1)^{-1}$ and by standing firm ($F = y$) with probability $p^D = 1/2$.*

Figure 6: The Game in Extensive Form



Notes. As for the three parameters λ, α^l, α^h, and δ, the following restrictions apply: $\lambda < 1/2$, $\alpha^l < 1$, $\alpha^h > 1$, and $\delta > 2$. It is further assumed that parameter constraint (A1) holds.

- *Aggressor A responds to $F = y$ by initiating the second escalation step ($E2 = y$) if it is of the low-cost type ($T = l$); and it responds by backing down ($E2 = n$) if it is of the high-cost type ($T = h$).*

This perfect Bayesian equilibrium is the only one in which the first escalation step ($E1 = y$) occurs with a strictly positive probability.

Proof. See Section A.3. ■

A notable feature of this equilibrium is that a high-cost type of aggressor may initiate the first escalation step even though it anticipates backing down and incurring the associated loss should the defender stand firm. The calculus behind this is a "scare tactic": The aggressor knows that with a positive probability escalation scares the defender into abandoning the threatened members, leaving the aggressor's resolve untested. The gain associated with this outcome compensates for the loss that results when the defender stands firm.

A.2 Escalation and Rising Geopolitical Risk

For the members of the defensive alliance threatened by the aggressor, a military confrontation between the aggressor and defender or an abandonment by the alliance are negative outcomes. These scenarios thus constitute the materialization of a geopolitical risk. Arguably, the same holds for external observers with an economic interest in those members (such as multinational corporations with plans to invest there). How does the belief about the likelihood of a geopolitical risk materializing change with the initiation of the first escalation step?

PROPOSITION 2. *Suppose A and D adhere to the equilibrium strategies stated in Proposition 1 and assume that both a military confrontation between A and D and an abandonment of the threatened members by D are considered materializations of geopolitical risk.*

Then, for any external observer with the same information as D (such as a multinational corporation), witnessing A initiate the first escalation step leads to a strict increase in the rational belief about the probability of geopolitical risk materializing (risk mat.)—from

$$\Pr[\textit{risk mat.}] = \frac{\delta\lambda}{2} \tag{A2}$$

to

$$\Pr[\textit{risk mat.} \mid E1 = y] = \frac{\delta(\delta - 1)^{-1}}{2} < 1. \tag{A3}$$

Proof. See Section A.3. ∎

Proposition 1 establishes that—if the escalation path is taken—the aggressor and the defender follow the strategies underlying Proposition 2. The latter then states that, in this case, an external observer without complete knowledge of the aggressor's type must reassess the geopolitical risk and adjust the perceived likelihood of materialization upward, even if materialization does not become inevitable. The extent of the adjustment is greater if the aggressive low-cost type emerges with a lower probability. This is because a lower probability implies that observing the aggressor initiating escalation comes as a bigger surprise.

It is finally worthwhile to take a closer look at equation (A2). The equation shows that the higher the defender's loss, δ, from a military confrontation with the aggressor, the greater the probability of a geopolitical risk materializing. One can plausibly view δ as a reflection of, among other factors, the defender's military strength, because military strength reduces casualties and material losses. With this interpretation of δ in mind, the equilibrium here is consistent with an old aphorism: "If you want peace, prepare for war."

A.3 Proofs

Proposition 1. We first establish the existence of the equilibrium specified in the proposition. Consider A's decision on $E1$ and assume that all subsequent decisions are taken as specified. First suppose that $T = l$. In this case, the expected payoff associated with $E1 = y$ is $p^D \cdot (-a^l) + (1 - p^D) \cdot 1$, where $p^D = 1/2$. The payoff associated with $E1 = n$ is 0. The condition of the former (expected) payoff exceeding the latter is equivalent to $a^l < 1$—a parameter restriction that is imposed. Thus, provided $T = l$, A a has no incentive to deviate from $E1 = y$. Now suppose that $T = h$. In this case, the expected payoff associated with $E1 = y$ is $p^D \cdot (-1) + (1 - p^D) \cdot 1$, where $p^D = 1/2$. The payoff associated with $E1 = n$ is again 0. As these two (expected) payoffs are identical, the high-cost type has no incentive to deviate from randomly choosing $E1 = y$ with probability $p^A = \lambda(1 - \lambda)^{-1}(\delta - 2)$.

Assume that $E1 = y$ and consider D's adoption of the posterior belief $q(T = l \mid E1 = y)$ and decision on F, assuming that all prior and subsequent decisions are taken as specified in the proposition. $E1 = y$ occurs with probability 1 if $T = l$ and with probability $p^A = \lambda(1-\lambda)^{-1}(\delta-2)$ if $T = h$. Given that the probability of $T = l$ is λ, it follows that $q(T = l \mid E1 = y) = \lambda/[\lambda+(1-\lambda)p^A]$. Using $p^A = \lambda(1-\lambda)^{-1}(\delta-2)$ then yields $q(T = l \mid E1 = y) = (\delta-1)^{-1}$. The expected payoff associated with $F = y$ is $q \cdot (-\delta) + (1 - q) \cdot (-1)$. The payoff associated with $F = n$ is -2. As with $q = (\delta - 1)^{-1}$ these two (expected) payoffs are identical, D has no incentive to deviate from randomly choosing $F = y$ with probability $p^D = 1/2$.

Assume $F = y$ and consider A's decision on $E2$. First suppose that $T = l$. In this case, the payoff associated with $E2 = y$ is $-a^l$, while the payoff associated with $E2 = n$ is -1. As $a^l < 1$, A has no incentive to deviate from $E2 = y$. Now suppose that $T = h$. In this case, the payoff associated with $E2 = y$ is $-a^h$, while the payoff associated with $E2 = n$ is -1. As $a^h > 1$, A has no incentive to deviate from $E2 = n$. To conclude, since there is no incentive to deviate at any stage of the game, the equilibrium's existence is established.

To demonstrate that this perfect Bayesian equilibrium is the only one in which the first escalation step occurs with a strictly positive probability (i.e., $\Pr[E1 = y] > 0$), we first show that in such an equilibrium D cannot follow a pure strategy. Assume, in contrast to what was just stated, that D always responds with $F = y$ to $E1 = y$. Then the optimal course of action for A would be to choose $E1 = n$ with probability 1 regardless of its type. Therefore, A always responding with $F = y$ to $E1 = y$ cannot be part of an equilibrium with $\Pr[E1 = y] > 0$. Now assume that D always responds with $F = n$ to $E1 = y$. Then, the optimal course of action for A would be to choose $E1 = y$ with probability 1 regardless of its type. Anticipating this, the optimal choice for D would be to opt for $F = y$ in response to $E1 = y$—which leads to a contradiction. Thus, in an equilibrium with $\Pr[E1 = y] > 0$, D must follow a mixed strategy. In turn, this implies that the (expected) payoffs associated with $F = y$ and $F = n$ must be identical. These payoffs are given by $q(-\delta) + (1 - q)(-1)$ and -2, respectively, where q stands for $q(T = l \mid E1 = y)$. Given this, $q(T = l \mid E1 = y) = (\delta - 1)^{-1}$ must hold.

Now consider the strategies of A, which fall into the following cases: (i) both types of A use a mixed strategy; (ii) one type uses a mixed strategy, while the other uses a pure strategy; (iii) both types use pure strategies. Case (i) can be ruled out as it would require that both types are indifferent between $E1 = y$ and $E1 = n$—a requirement that cannot be satisfied since $\alpha^l \neq \alpha^h$. All the subcases in (iii) can be ruled out either due to inconsistency with $q(T = l \mid E1 = y) = (\delta - 1)^{-1}$ or with $\Pr[E1 = y] > 0$. The two subcases of (ii) in which the pure strategy is $E1 = n$ can be ruled out due to inconsistency with $q(T = l \mid E1 = y) = (\delta - 1)^{-1}$. Finally, it can be ruled out that the low-cost type chooses the mixed strategy while the high-cost type chooses the pure strategy with $E1 = y$: If the low-cost type is indifferent between $E1 = y$ and $E1 = n$, the high-cost type must prefer $E1 = n$. Thus, the only remaining subcase of (ii) is that the low-cost type chooses the pure strategy with $E1 = y$, while the high-cost type follows a mixed strategy. To conclude, in an equilibrium with $\Pr[E1 = y] > 0$, D and the high-cost type of A must follow a mixed strategy, while the low-cost type of A follows a pure strategy with $E1 = y$. This leads to the unique expressions for p^A, p^D, and q as stated in the proposition. □

Proposition 2. Prior to A's decision on $E1$, the external observer understands that geopolitical risk can materialize in three different ways: either $T = l$, $E1 = y$, $F = n$; or $T = l$, $E1 = y$, $F = y$, $E2 = y$; or $T = h$, $E1 = y$, $F = n$. From Figure 6 and Proposition 1, one can infer that respective probabilities are given by $\lambda(1 - p^D)$, λp^D, $(1 - \lambda)p^A(1 - p^D)$. With $p^A = \lambda(1 - \lambda)^{-1}(\delta - 2)$ and $p^D = 1/2$, the sum of these three probabilities equals $\delta\lambda/2$. Due to constraint (A1), this probability is strictly less than $\delta/[2(\delta - 1)]$.

Upon witnessing A opt for $E1 = y$, the external observer adopts the posterior belief $q(T = l \mid E1 = y) = (\delta - 1)^{-1}$. It then follows from Figure 6 and Proposition 1 that, conditional on $T = l$ and $E1 = y$, the probability of geopolitical risk materializing is 1. It further follows that, conditional on $T = h$ and $E1 = y$, the probability of geopolitical risk materializing is $(1 - p^D)$. Thus, overall, the probability of a geopolitical risk materializing is $q \cdot 1 + (1 - q) \cdot (1 - p^D)$. With $q = (\delta - 1)^{-1}$ and $p^D = 1/2$, this sum equals $\delta/[2(\delta - 1)]$. Since $\delta > 2$, this expression must be strictly less than 1. □

Appendix II

Additional Tables

Table 7: Robustness—Restrictive FE

	Dependent variable:					
	ln(FDI)					
	(1)	(2)	(3)	(4)	(5)	(6)
Prox (continuous) * post-February 2022	-0.0045***		-0.0045***		0.0019	
	(0.0008)		(0.0008)		(0.0014)	
Prox (dummy) * post-February 2022		-0.0653***		-0.0649***		-0.0042
		(0.0107)		(0.0107)		(0.0108)
District FE	✓	✓	✓	✓	✓	✓
Year-Month FE	✓	✓	✓	✓	✓	✓
Country FE	✓	✓	✓	✓	✓	✓
Country-Month FE			✓	✓		
Country-Year FE					✓	✓
No. of Districts	5097	5097	5097	5097	5097	5097
Dep. var. mean	0.151	0.151	0.151	0.151	0.151	0.151
Dep. var. std. dev.	1.607	1.607	1.607	1.607	1.607	1.607
Observations	458,730	458,730	458,730	458,730	458,730	458,730

Notes: The standard errors in parentheses are clustered at the district level. All estimations are TWFE models with the indicated fixed effects. The dependent variable, FDI flows, is transformed using a log-transformation with a shift of one: $FDI \rightarrow \ln(FDI + 1)$. Prox (continuous) measures in units of 100 km of road distance how much closer a district is to Russia compared to the most distant district. Prox (dummy) is a dummy variable that indicates whether proximity to Russia is above or below the mean. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 8: Robustness—Transformations

	Dependent variable:					
	ln(FDI)		IHS(FDI)		No. FDI Projects	
	(1)	(2)	(3)	(4)	(5)	(6)
Prox (continuous) * post-February 2022	-0.0045***		-0.0047***		-0.0003***	
	(0.0008)		(0.0008)		(0.0001)	
Prox (dummy) * post-February 2022		-0.0653***		-0.0679***		-0.0043***
		(0.0107)		(0.0111)		(0.0012)
District FE	✓	✓	✓	✓	✓	✓
Country FE	✓	✓	✓	✓	✓	✓
Year-Month FE	✓	✓	✓	✓	✓	✓
No. of Districts	5097	5097	5097	5097	5097	5097
Dep. var. mean	0.151	0.151	0.157	0.157	0.016	0.016
Dep. var. std. dev.	1.607	1.607	1.671	1.671	0.24	0.24
Observations	458,730	458,730	458,730	458,730	458,730	458,730

Notes: The standard errors in parentheses are clustered at the district level. All estimations are TWFE models with the indicated fixed effects. In Columns (1) and (2), which reproduce the baseline results, the dependent variable, FDI flows, is transformed using a log-transformation with a shift of one: $FDI \rightarrow \ln(FDI + 1)$. In Columns (3) and (4), an inverse hyperbolic sine (IHS) transformation is applied: $FDI \rightarrow \ln\left(FDI + \sqrt{FDI^2 + 1}\right)$. Columns (5) and (6) use the simple count of new FDI projects as the dependent variable. Prox (continuous) measures in units of 100 km of road distance how much closer a district is to Russia compared to the most distant district. Prox (dummy) is a dummy variable that indicates whether proximity to Russia is above or below the mean. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 9: Robustness—Dropping One Country at a Time

	Dependent variable: ln(FDI)								
	BGR	EST	ROU	LVA	HUN	SVK	CZE	LTU	POL
Panel A:	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Prox (continuous) * post-February 2022	-0.0043***	-0.0055***	-0.0023*	-0.0087***	-0.0045***	-0.0046***	-0.0042***	-0.0040***	-0.0018***
	(0.0008)	(0.0009)	(0.0012)	(0.0014)	(0.0008)	(0.0008)	(0.0008)	(0.0007)	(0.0007)
Panel B:									
Prox (dummy) * post-February 2022	-0.0628***	-0.0728***	-0.0969***	-0.0927***	-0.0663***	-0.0660***	-0.0550***	-0.0611***	-0.0315***
	(0.0107)	(0.0117)	(0.0198)	(0.0148)	(0.0104)	(0.0102)	(0.0105)	(0.0105)	(0.0101)
District FE	✓	✓	✓	✓	✓	✓	✓	✓	✓
Country FE	✓	✓	✓	✓	✓	✓	✓	✓	✓
Year-Month FE	✓	✓	✓	✓	✓	✓	✓	✓	✓
Dep. var. mean	0.149	0.154	0.344	0.167	0.136	0.145	0.138	0.145	0.101
Dep. var. std. dev.	1.599	1.622	2.414	1.687	1.526	1.577	1.538	1.573	1.306
No. of Districts	4832	4883	1862	4508	4899	5018	5020	5037	4717
Observations	434,880	439,470	167,580	405,720	440,910	451,620	451,800	453,330	424,530

Notes: The standard errors in parentheses are clustered at the district level. All estimations are TWFE models with the indicated fixed effects. The dependent variable, FDI flows, is transformed using a log-transformation with a shift of one: $FDI \rightarrow \ln(FDI + 1)$. Prox (continuous) measures in units of 100 km of road distance how much closer a district is to Russia compared to the most distant district. Prox (dummy) is a dummy variable that indicates whether proximity to Russia is above or below the mean. The 3-digit country code at the top of a column indicates which country's districts are excluded. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 10: Robustness—Dropping All Baltic States Simultaneously

	Dependent variable: ln(FDI)			
	Baseline		EST, LVA, LTU excl.	
	(1)	(2)	(3)	(4)
Prox (continuous) * post-February 2022	-0.0045***		-0.0122***	
	(0.0008)		(0.0019)	
Prox (dummy) * post-February 2022		-0.0653***		-0.1044***
		(0.0107)		(0.0173)
District FE	✓	✓	✓	✓
Time FE	✓	✓	✓	✓
Country FE	✓	✓	✓	✓
No. of Districts	5097	5097	4234	4234
Dep. var. mean	0.151	0.151	0.163	0.163
Dep. var. std. dev.	1.607	1.607	1.672	1.672
Observations	458,730	458,730	381,060	381,060

Notes: The standard errors in parentheses are clustered at the district level. All estimations are TWFE models with the indicated fixed effects. The dependent variable, FDI flows corresponds to $FDI \rightarrow \ln(FDI+1)$. Prox (continuous) measures in units of 100 km of road distance how much closer a district is to Russia compared to the most distant district. Prox (dummy) is a dummy variable that indicates whether proximity to Russia is above or below the mean. In Columns (3) and (4), districts from the three Baltic states Estonia, Latvia, and Lithuania are excluded from the sample. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 11: Channels—Excluding Russian FDI Flows

	Dependent variable:			
	ln(FDI)		ln(FDI excl. Russian flows)	
	(1)	(2)	(3)	(4)
Prox (continuous) * post-February 2022	-0.0045***		-0.0045***	
	(0.0008)		(0.0008)	
Prox (dummy) * post-February 2022		-0.0653***		-0.0644***
		(0.0107)		(0.0106)
District FE	✓	✓	✓	✓
Country FE	✓	✓	✓	✓
Year-Month FE	✓	✓	✓	✓
No. of Districts	5097	5097	5097	5097
Dep. var. mean	0.151	0.151	0.15	0.15
Dep. var. std. dev.	1.607	1.607	1.603	1.603
Observations	458,730	458,730	458,730	458,730

Notes: The standard errors in parentheses are clustered at the district level. All estimations are TWFE models with the indicated fixed effects. The dependent variable, FDI flows, is transformed using a log-transformation with a shift of one: $FDI \rightarrow \ln(FDI+1)$ and FDI excl. Russian flows $\rightarrow \ln(FDI$ excl. Russian flows$+1)$. The latter includes all but Russian FDI flows. Prox (continuous) measures in units of 100 km of road distance how much closer a district is to Russia compared to the most distant district. Prox (dummy) is a dummy variable that indicates whether proximity to Russia is above or below the mean. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 12: Mechanisms—New versus Expansion FDI Projects

	Dependent variable:					
	ln(FDI)		ln(FDI new projects)		ln(FDI expansions)	
	(1)	(2)	(3)	(4)	(5)	(6)
Prox (continuous) * post-February 2022	-0.0045***		-0.0031***		-0.0015***	
	(0.0008)		(0.0007)		(0.0005)	
Prox (dummy) * post-February 2022		-0.0653***		-0.0408***		-0.0255***
		(0.0107)		(0.0089)		(0.0065)
District FE	✓	✓	✓	✓	✓	✓
Country FE	✓	✓	✓	✓	✓	✓
Year-Month FE	✓	✓	✓	✓	✓	✓
No. of Districts	5097	5097	5097	5097	5097	5097
Dep. var. mean	0.151	0.151	0.109	0.109	0.061	0.061
Dep. var. std. dev.	1.607	1.607	1.367	1.367	1.014	1.014
Observations	458,730	458,730	458,730	458,730	458,730	458,730

Notes: The standard errors in parentheses are clustered at the district level. All estimations are TWFE models with the indicated fixed effects. The dependent variable, FDI flows, is transformed using a log-transformation with a shift of one: $FDI \rightarrow \ln(FDI+1)$, FDI new projects $\rightarrow \ln(FDI \text{ new projects} + 1)$, and FDI expansions $\rightarrow \ln(FDI \text{ expansions} + 1)$. FDI new projects include flows financing new investments, while FDI expansions refer to the financing of expansions of existing operations. Prox (continuous) measures in units of 100 km of road distance how much closer a district is to Russia compared to the most distant district. Prox (dummy) is a dummy variable that indicates whether proximity to Russia is above or below the mean. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 13: Mechanisms—FDI Flows from EU & EFTA and Allies

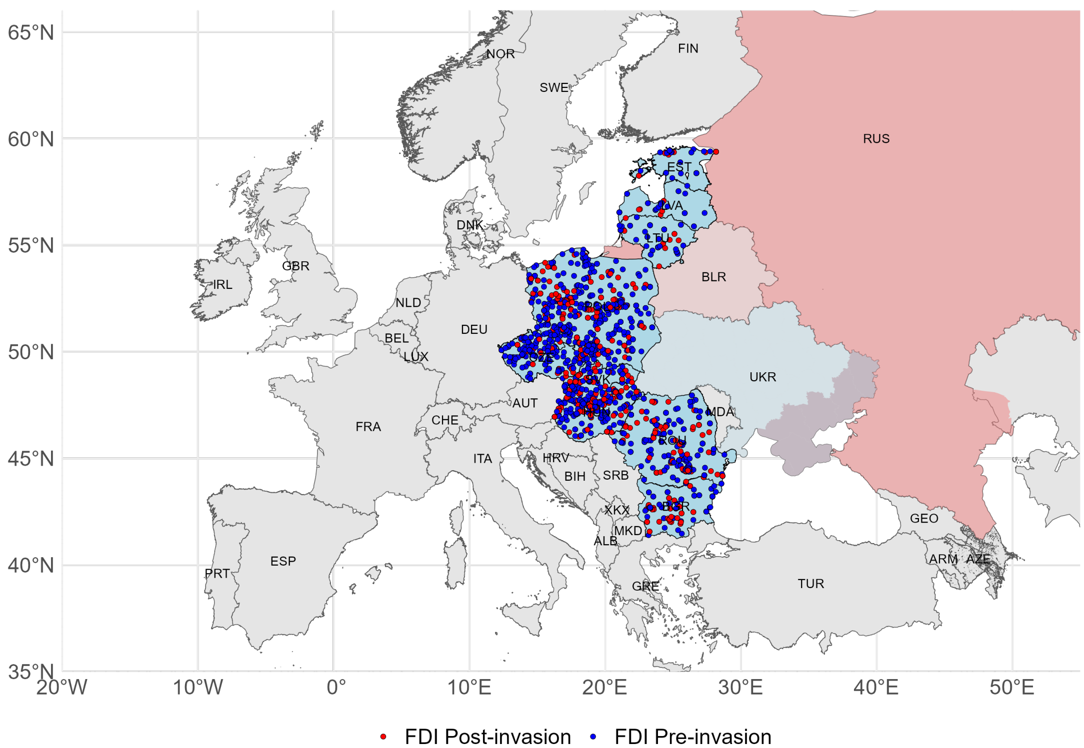
	Dependent variable:					
	ln(FDI)		ln(FDI EU & EFTA)		ln(FDI allies)	
	(1)	(2)	(3)	(4)	(5)	(6)
Prox (continuous) * post-February 2022	-0.0045***		-0.0045***		-0.0044***	
	(0.0008)		(0.0007)		(0.0008)	
Prox (dummy) * post-February 2022		-0.0653***		-0.0634***		-0.0648***
		(0.0107)		(0.0095)		(0.0103)
District FE	✓	✓	✓	✓	✓	✓
Country FE	✓	✓	✓	✓	✓	✓
Year-Month FE	✓	✓	✓	✓	✓	✓
No. of Districts	5097	5097	5097	5097	5097	5097
Dep. var. mean	0.151	0.151	0.118	0.118	0.145	0.145
Dep. var. std. dev.	1.607	1.607	1.415	1.415	1.575	1.575
Observations	458,730	458,730	458,730	458,730	458,730	458,730

Notes: The standard errors in parentheses are clustered at the district level. All estimations are TWFE models with the indicated fixed effects. The dependent variable, FDI flows, is transformed using a log-transformation with a shift of one: $FDI \rightarrow \ln(FDI + 1)$, FDI EU & EFTA $\rightarrow \ln(FDI$ EU & EFTA $+ 1)$, and FDI allies $\rightarrow \ln(FDI$ allies $+ 1)$. FDI EU & EFTA includes FDI flows from members of these two organizations plus the United Kingdom. FDI allies includes FDI flows from countries that voted "yes" on UN Resolution A/RES/ES-11/1, which deplores the aggression by the Russia against Ukraine. Prox (continuous) measures in units of 100 km of road distance how much closer a district is to Russia compared to the most distant district. Prox (dummy) is a dummy variable that indicates whether proximity to Russia is above or below the mean. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Appendix III

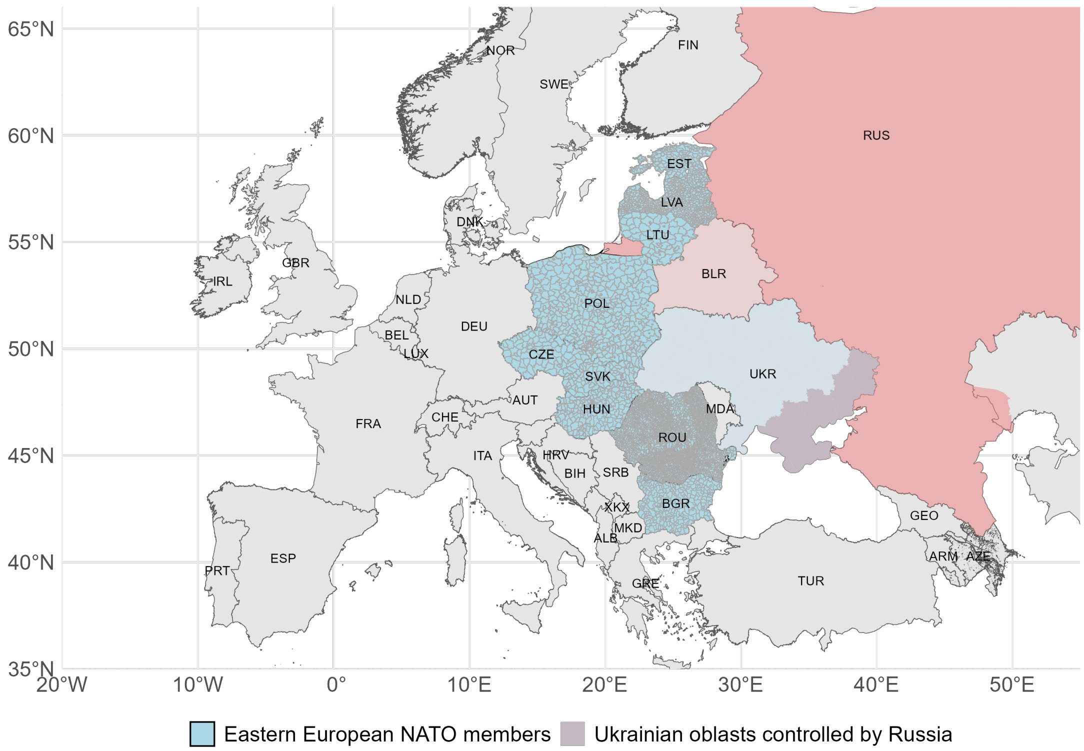
Additional Maps

Figure 7: Map of Europe—FDI Project Locations



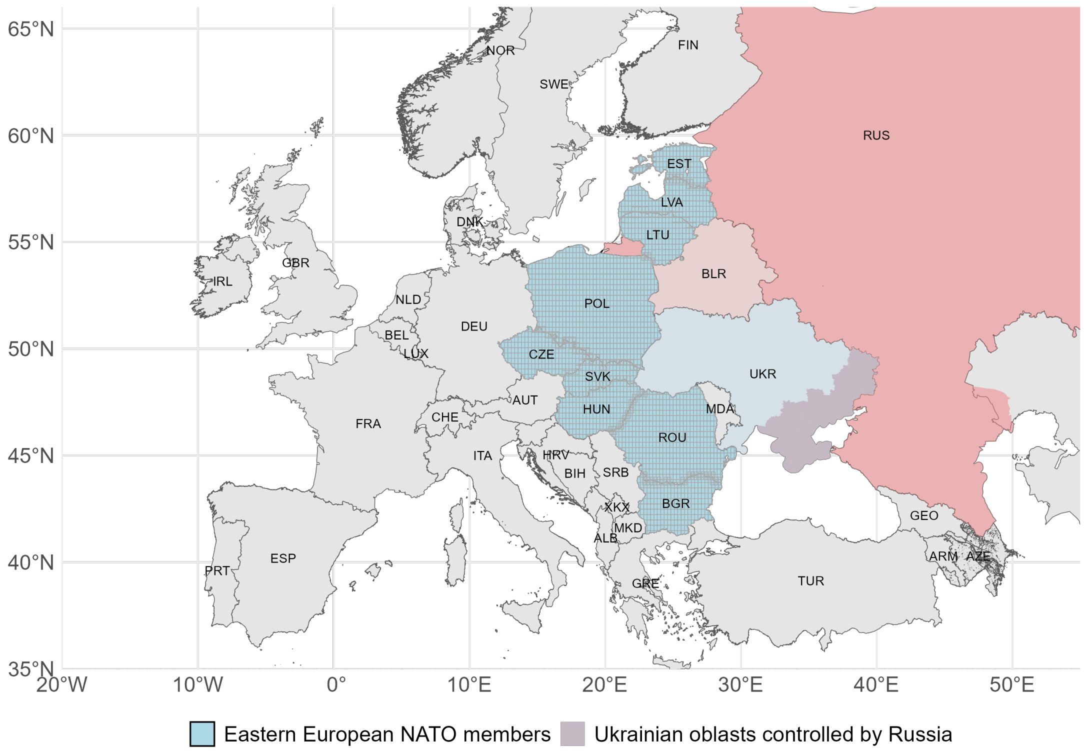
Notes. Blue (red) dots show the city-level locations of FDI projects announced between January 2017 and June 2024, before (after) the start of Russia's invasion of Ukraine. See Figure 2 for the coloring of countries/regions.

Figure 8: Map of Europe—District Boundaries



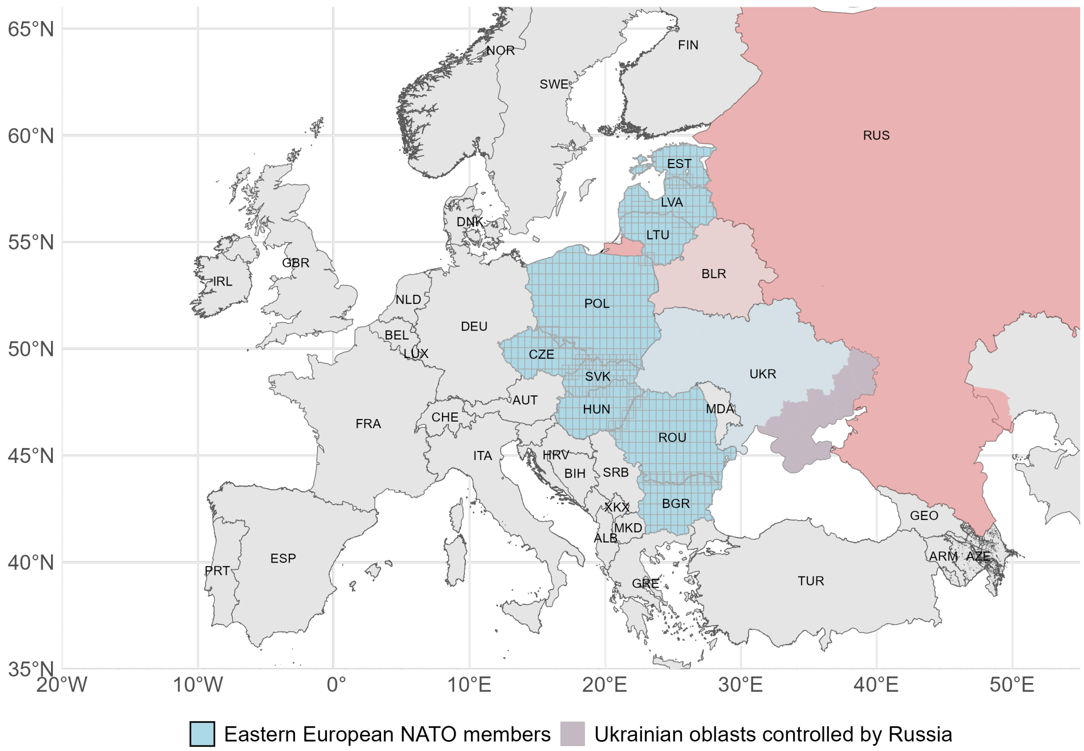
Notes. The light-gray lines show the district boundaries (ADM2) within the nine Eastern European NATO members. See Figure 2 for more information on the coloring of countries/regions.

Figure 9: Map of Europe—0.25° × 0.25° Grid Cell Boundaries



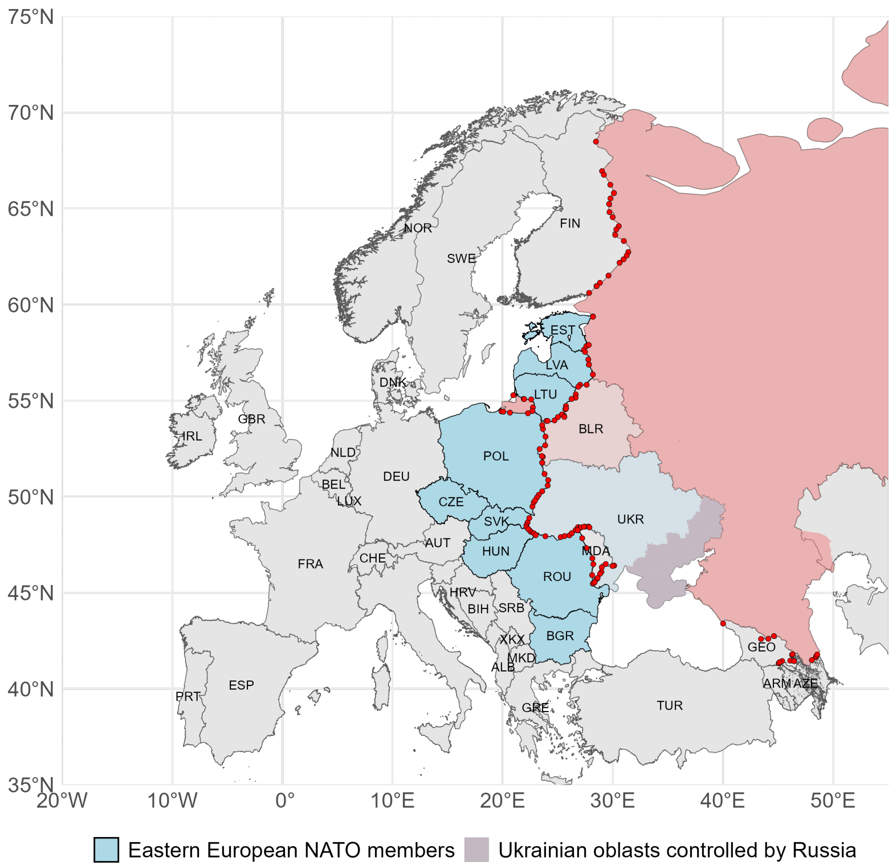
Notes. The light-gray lines show the 0.25° × 0.25° grid cell boundaries within the nine Eastern European NATO members. See Figure 2 for more information on the coloring of countries/regions.

Figure 10: Map of Europe—$0.5° \times 0.5°$ Grid Cell Boundaries



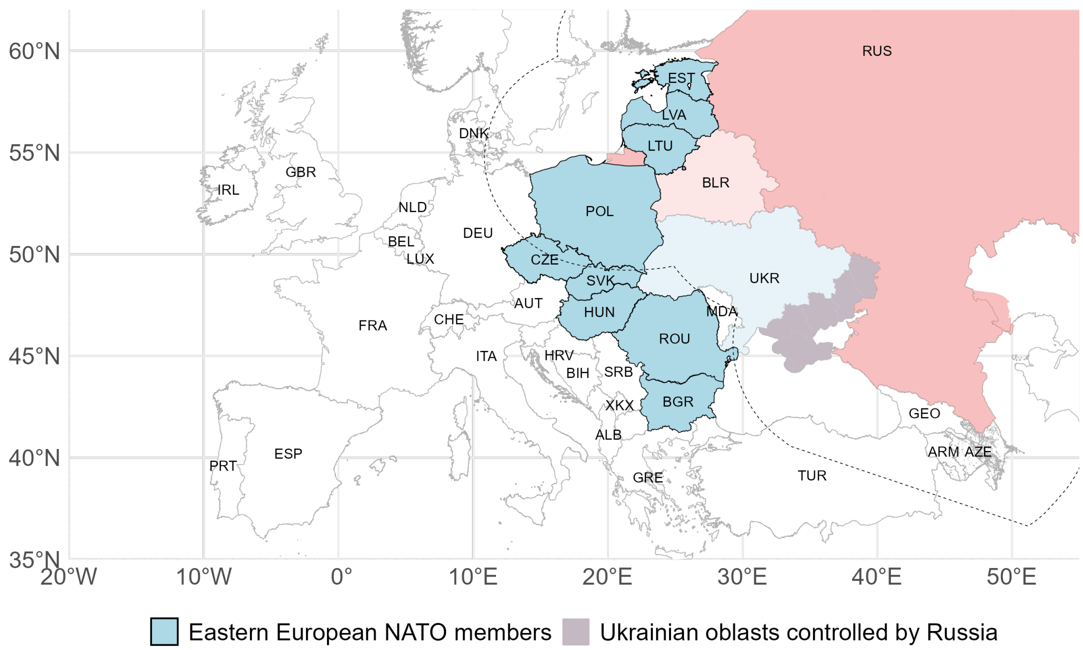
Notes. The light-gray lines show the $0.5° \times 0.5°$ grid cell boundaries within the nine Eastern European NATO members. See Figure 2 for more information on the coloring of countries/regions.

Figure 11: Map of Europe—Border Checkpoints



Notes. The red dots show the locations of border checkpoints into Eastern European NATO members from Russia, Belarus, Ukraine, and Moldova, as well as checkpoints into Finland, Georgia, and Azerbaijan from Russia. See Figure 2 for more information on the coloring of countries/regions.

Figure 12: Map of Europe—569 km Buffer Zone



Notes. The dashed line delineates a 569 km buffer zone around Russia, with 569 km corresponding to one standard deviation of road distance to the nearest Russian border checkpoint. See Figure 2 for more information on the coloring of countries/regions.

Appendix IV

Data Sources and Variable Definitions

Foreign Direct Investments - Any FDI inflow values are sourced from the fDiMarkets database released by the Financial Times. The Financial Times states that information about announcements of foreign capital expenditures is sourced from project data received by the Financial Times from industry organisations, investment agencies as well as media sources, in addition to internal information sources of the Financial Times and the Financial Times newswires. Additionally, purchased data is used from market research and publication companies. There is a cross-referencing via multiple sources in place, including direct company sources. Invested amounts are estimated by an econometric algorithm if there is no information on the size of the investment amount. We have access to projects from January 2003 to June 2024. Information provided for each project includes the month and year of the announcement, the source country as well as the destination country, region and city. Additionally, the amount of capital expenditure in USD, jobs created by the project and whether these amounts are estimated or not. Furthermore, the database provides information on the cluster, sector and sub-sector of the project. In the data available to us, we do not have any additional company identification. In our estimations, we use projects announced from January 2017 to June 2024 sourced from countries worldwide with their destination in one of the following countries: Bulgaria, Estonia, Romania, Latvia, Hungary, Slovakia, Czech Republic, Lithuania and Poland. While the database gives geographical information about the location on the city level, it does not provide any coordinates. Any project that has a city location specified is thus georeferenced with coordinates using a Google Maps API. Coordinates are matched using the country, province and city name. Locations are then manually verified.

Expansions vs. New Projects - We consider as new projects any tracked cross-border investments which result in a new physical project as stated in the fDiMarkets database. Joint ventures that lead to a new physical operation are also included, however, mergers and acquisitions are not. According to the fDiMarkets classification expansions are only included if it builds onto an existing investment but resulting in new job creation and new capital investment.

Tradable vs. Non-Tradable - In economics, there is a long tradition of classifying goods as internationally tradable or non-tradable (Woodland, 2017). A good is non-tradable when its nature or transport costs restrict the consumer base to the local, regional, or national market. In practice, there is, of course, no strict dichotomy between tradable and non-tradable goods. Therefore, in empirical work, the pragmatic standard approach has long been a classification according to economic sector: services are classified as non-tradable (Gervais and Jensen, 2019), while goods from mining, agriculture, and manufacturing are considered tradable. We follow this approach here. When it comes to industry classification, fDi Markets—unlike the International Standard Industrial Classification (ISIC)—does not primarily follow a sectoral logic. Instead, as per its website (https://www.fdimarkets.com/faqs), 'each project tracked by fDi Markets is classified and tagged according to its cluster, sector, sub-sector ..., based on a proprietary industry classification system.' For example, a project in the 'Industrial' cluster may aim to produce a manufactured good (as in 'Industrial, Industrial equipment, Metalworking machinery') or to provide a service (as in 'Industrial, Business services, Employment services'). Against this background, we adopt the following basic approach: we classify as non-tradable all projects where the 'cluster, sector, sub-sector' description contains the word 'service', regardless of whether the word appears under cluster, sector, or sub-sector. In the context of the above example, this means that the first project is classified as tradable and the second as non-tradable. To these projects, we add those whose descriptions do not contain 'service' but include terms that suggest an affiliation to sectors such as utilities, real estate, and retail trade—sectors that focus on the local, regional, or national market. This approach can be refined. More recently, technological progress has improved the tradability of services (Francois and Hoekman, 2010). This is particularly true for services that are knowledge-based and can be delivered electronically, such as those in the fields of financial services, professional consulting services, or research and development. As a robustness check, we can deviate from the basic approach and classify as tradable projects whose descriptions contains the word 'service' but suggest an affiliation with one of these fields (as in 'Energy, Financial services, Corporate investment banking').

EU/EFTA, Allies and Non-Allies - For these specifications, we differentiate investment flows according to geopolitical alliances of the source countries. EU and EFTA accounts for any FDI flows with the source country within the EU27, the economies of the European Free Trade Association (EFTA) namely Iceland, Liechtenstein, Norway, and Switzerland. Additionally, we also include the United Kingdom in this subgroup of source countries. The differentiation of allied and non-allied nations follows the UN Resolution No. A/RES/ES-11/1 'Aggression against Ukraine' which "condems the 24 February 2022 declaration by the Russian

Figure 13: Satellite Image - Unofficial Border Crossing

Notes. The image shows a satellite image sourced from Google Maps with road infrastructure and other border facilities on both sides of the border.

Federation of a 'special military operation' in Ukraine" and "reaffirms that no territorial acquisition resulting from the threat or use of force shall be recognized as legal" (United Nations General Assembly, 2022). Countries that voted with "YES" in the UN General Assembly are considered an allied country, while those who voted "NO", abstained or did not vote are considered non-allies. The information on the voting behavior is publicly available. Taiwan and Hongkong are special cases as they are both not part of the UN General Assembly. Following Gopinath et al. (2025), we consider Taiwan as an allied country while Hongkong is regarded to be aligned with China and thus abstained.

Distance Measures - Distances are calculated based on the district (geoBoundaries 5.0.0 API) or cell polygons and their distance to the coordinates of the closest border checkpoint.

Checkpoints - We use lists of border crossing points of official websites such as a countries customs agency, EU border crossing lists, the border police etc. to track any official border crossing for each Eastern European country. The full list of sources for each crossing can be found in the data appendix. We manually verify and georeference these official crossing locations using Google Maps. Additionally, we differentiate between road, railway and port border checkpoints. For any railway checkpoints, we georeference the first train station after railtracks crossing an internationally recognized border. In addition to the official lists of border crossings, we manually identify any border crossings via satellite images that provide sufficient infrastructure to cross a countries border and thus could be used by a hostile military to enter a country. Figure 13 shows a satellite image of such a manually identified unofficial border crossing. It shows that on both sides of the border there is infrastructure to cross the border e.g. with military equipment that requires road infrastructure.

Road Distance - We estimate the road distance using the ADM2 polygons of geoBoundaries. Additionally, we also estimate the road distances for grid cell polygons in the sizes of $0.25° \times 0.25°$ and $0.5° \times 0.5°$. For each polygon we randomly select 20 location points. For each of these randomly selected location points, the road distance to the closest checkpoint location is then estimated. A polygons distance to the nearest checkpoint assumes the average of the distances from these 20 randomly selected locations. For the road distance, we rely on the Open Street Routing Machine (OSRM) Project API which relies on the road network from Open Street Map data. Our distances are specified as the fastest driving distance between two location points. The distance is measured in kilometers of road distance. For countries without a direct border with Russia (or depending on the specification Belarus or Ukraine) this means the nearest border checkpoint with Russia could be in a neighboring country. In our baseline estimations, the proximity relies in the background on the road distance which is the average road distance per polygon to the closest border checkpoint with Russia. In other specifications, we estimate the distance to the closest border checkpoint with Ukraine or alternatively the average road distance to a border checkpoint with either Belarus or Russia. For this specification, it could be the case that e.g. for some Polish districts, checkpoints along the border with Belarus are closer while for others the ones with Russia are closer. Respectively, in this specification we do not differentiate between Belarussian or Russian border checkpoints.

Beeline Distance - The beeline distance is calculated differently. It uses the centroid of a polygon (ADM2 or cell) and estimates the distance "as-the-bird-flies" to the closest border checkpoint depending on the specification. It, therefore, does not rely on any road network and could e.g. be seen as the distance that drones would have to cover.

Proximity vs. Distance - So far, we described the process to have a distance measure. However, in our estimations we rely on a proximity measure which consists of the difference in road distance to the nearest border checkpoint (considering the specification) between the most distance district and the district under consideration. Thus, our proximity measure is relative and describes how much closer a certain district is compared to the most distant district.