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Duong, Kiet Tuan [orcid.org/0000-0002-1078-8079](https://orcid.org/0000-0002-1078-8079), Huynh, Luu Duc Toan, Phan, Anh Dang Bao et al. (1 more author) (2024) *From Russia with love: International risk-sharing, sanctions, and firm investments*. *Economics Letters*. 112005. ISSN 0165-1765

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# From Russia with love: International risk-sharing, sanctions, and firm investments<sup>☆</sup>

Kiet Tuan Duong<sup>a</sup>, Luu Duc Toan Huynh<sup>b</sup>, Anh Dang Bao Phan<sup>c</sup>, Nam T. Vu<sup>d,\*</sup>

<sup>a</sup> University of York, United Kingdom

<sup>b</sup> Queen Mary University of London, United Kingdom

<sup>c</sup> University of Liverpool, United Kingdom

<sup>d</sup> Miami University, United States of America

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## ABSTRACT

We propose a novel explanation for why sanctions on Russian firms might not work as intended: these firms' ability to diversify sanction risks via partner countries friendly with Russia. Using indirect links with partner firms as a plausibly exogenous proxy for this risk-sharing channel, we show that exposed Russian firms were able to leverage these links to alleviate the negative impacts of sanctions in 2014.

## 1. Introduction

Recent sanctions on Russia have rekindled interest from academics and policymakers alike on the potential impacts of these policies on Russian firms. While it is well-documented that these sanctions have largely been ineffective (Ahn and Ludema, 2020; Nigmatulina, 2022; Gaur et al., 2023), the channels through which Russian firms avoid the negative impacts of sanctions are still unclear.

Our paper fills this gap by exploring Russian firms' ability to diversify sanction risks and geopolitical risks (Klein, 2024) via partner firms as a potential channel to explain why sanctions on Russian firms might not be as effective as intended. Among key metrics on firm outcomes, our focus is on firm investments since hindering the ability of Russian firms to leverage the capital channel has been one of the cornerstones of the Biden administration strategy regarding Russian sanctions.<sup>1</sup> Such a focus on firm investments is also motivated, in part, by theoretical literature on economic gains from international risk-sharing via the asset channel (Cole and Obstfeld, 1991; Devereux and Smith, 1994).

Turning to more details, we study the risk-sharing channel of sanctions by examining indirect business relations between Russian firms and those in countries not supporting sanctions against Russia, leveraging such ties as a plausibly exogenous proxy for diversifying sanction risks. By focusing on indirect relations, we aim to establish causal links by circumventing potential biases where firm characteristics might influence business relations, thus avoiding confounding effects when assessing the impact of sanctions on firm investments.

Our paper contributes to the ongoing literature on sanctions by providing a channel that helps Russia avoid the adverse impacts of sanctions. While recent literature has documented accesses to partners via international trades (Morgan et al., 2023) and country-to-country relations, our paper is the first, to the best of our knowledge, to assess how firm-to-firm relations can help alleviate the impacts of sanction along the capital channel. It is worth mentioning that the risk-sharing effects are relevant not only to Russia but also to Western countries (Chowdhry et al., 2024) because several EU governments are advocating for G7 countries to participate in risk-sharing initiatives.<sup>2</sup>

<sup>☆</sup> The order of authors is determined alphabetically by their last names. We are grateful for Peter Tillman for helpful comments. All errors remain ours.

\* Corresponding author.

E-mail addresses: [kiet.duong@york.ac.uk](mailto:kiet.duong@york.ac.uk) (K.T. Duong), [t.huynh@qmul.ac.uk](mailto:t.huynh@qmul.ac.uk) (L.D.T. Huynh), [a.phan@liverpool.ac.uk](mailto:a.phan@liverpool.ac.uk) (A.D.B. Phan), [vunt@miamioh.edu](mailto:vunt@miamioh.edu) (N.T. Vu).

<sup>1</sup> See, for example, recent comments by Deputy Treasury Secretary Wally Adeyemo. Source: <https://www.cfr.org/background/what-are-economic-sanctions>. Last accessed August 2, 2024.

<sup>2</sup> See more at <https://www.reuters.com/world/europe/how-g7-eu-plan-leverage-frozen-russian-assets-ukraine-2024-06-06/>. Last accessed September 16, 2024.

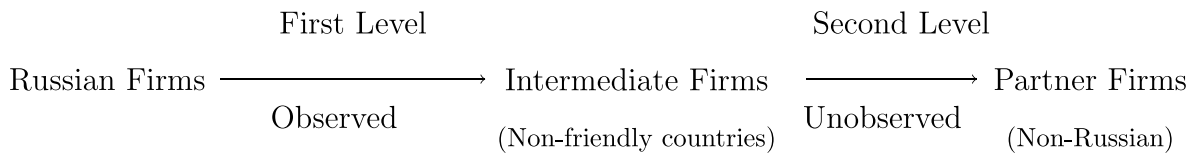


Fig. 1. The anatomy of an indirect relation.

## 2. Empirical strategy

### 2.1. Identification

We leverage indirect firm-to-firm business relations between Russian firms and their business partners from a friendly nation to identify the risk-sharing channel of sanctions. Our strategy critically hinges on identifying Russian firms' indirect business relations with companies in countries that voted absent or against sanctioning Russia in 2014 (i.e., friendly countries).<sup>3</sup>

Intuitively, firms can maintain direct business relations with their counterparts from friendly countries despite sanctions, allowing these firms to actively diversify risks associated with declines in aggregate demand due to sanction-related constraints. Alternatively, firms can also maintain indirect business relations with their counterparts from friendly countries via other intermediate partners. Whether the relation is direct or indirect, firms benefit from having access to the global market via partners in friendly countries in both the production factor and the goods market.

One potential issue arising from using direct business relations to proxy for the risk-sharing channel is that Russian firms may choose to engage in business relations with firms in specific countries based on the nature of their business and their fundamentals, possibly confounding the effects of the risk-sharing channel of sanction. After all, relations can improve economic outcomes, and the latter can determine which relation to establish. This issue, if not adequately dealt with, shall prevent us from establishing a causal relation from having access to risk-sharing to firm fundamentals.

Such an issue motivates us to use *indirect* business relations (either as a customer or supplier) of Russian firms with partner firms in friendly nations to capture the extent to which these Russian firms can diversify sanction risks. In particular, we construct a list of intermediate firms with a business tie with all Russian firms in the sample (i.e., first-level). We then identify each intermediate firm's relations with firms in countries friendly to Russia (i.e., second-level). While Russian firms know which intermediate firms they are dealing with, they do not have complete information concerning the partner firms with which each intermediate firm has business dealings. This lack of complete information allows us to leverage each Russian firm's indirect relations with partners from countries friendly to Russia as a plausibly exogenous proxy for their ability to diversify sanction risks in 2014. As we advance, we shall use indirect business relations in all empirical analyses.

Fig. 1 depicts how relations between Russian firms and those from friendly countries are constructed. A business relation exists between two firms if the two firms are either customers or suppliers of each other. An indirect business relation exists if two firms maintain business relations via a third partner. An indirect relation thus encompasses two relation levels. In the first level, a Russian firm is connected to an intermediate firm, which can be located in any country.<sup>4</sup> In the second level, such an intermediate firm is connected to another non-Russian

firm in other countries friendly with Russia; that is, countries that voted "abstain" or "against" in United Nations General Assembly resolutions that aim to sanction Russia in 2014 and 2022.<sup>5</sup>

Our identification strategy is motivated, in part, by the growing existing literature on the differential impacts of sanctions on firm performances (Ahn and Ludema, 2020; Nigmatulina, 2022; Gaur et al., 2023). This literature typically categorizes firms into sanctioned groups using government documents,<sup>6</sup> with subsidiaries of sanctioned firms included in the treatment group, and all other firms placed in the control group. Arguably, these sanctioned firms may have already drawn the attention of Western entities before the implementation of sanctions, suggesting that their selection is not exogenous to firm characteristics. Although the sanctions are designed to be 'smart' tools targeting specific firms, there might be ways to avoid these sanctions through strategies like 'strategic allocation' (Ahn and Ludema, 2020) or using government contractors (Nigmatulina, 2022), ex-ante their predictions. Thus, relying solely on the explicit list of sanctioned firms or individuals might diminish the effects of sanctions.

To avoid the possibility that firms' characteristics might influence the extent to which firms are exposed to firm-specific sanctions, we leverage the general timing of nationwide sanctions imposed on Russia. Intuitively, while a nationwide sanction might impact an individual firm's business conduct, the average firm cannot impact Russia's probability of imposing a sanction on its own.

### 2.2. Empirical specification

Our benchmark empirical specification is as follows:

$$Y_{it} = \alpha + \beta_1 \mathbb{I}(t \geq T_{\text{Sanction}}) + \beta_2 \mathbb{I}(t \geq T_{\text{Sanction}}) \times \mathbb{R}_{it-1} + \beta_3 \mathbb{R}_{it-1} + \theta \mathbb{X}_{it-1} + \gamma \Gamma_i + \xi \Xi_t + \varepsilon_{it}, \quad (1)$$

where  $Y_{it}$  is our dependent variable of interest for firm  $i$  at time  $t$ ,  $\mathbb{I}(t \geq T_{\text{Sanction}})$  is an indicator function that take a value of 1 if the observation is on or after the year of sanction  $T_{\text{Sanction}}$  and 0 otherwise,  $\mathbb{R}_{it}$  is the fraction of *indirect* business relations that the firm has with firms in countries that voted absent or against sanctioning Russia in 2014 over its total number of business relations at time  $t$ .<sup>7</sup>  $\Gamma_i$  and  $\Xi_t$  denote the firm and year fixed effects, respectively.

Our coefficient of interest is  $\beta_2$ , which captures the extent to which having access to international risk-sharing *ex-ante* (i.e.,  $\mathbb{R}_{it-1}$ ) via indirect business relations can help Russian firms alleviate the impact of the 2014 sanction on Russia. Our dependent variable  $Y_{it}$  is either tangible assets or capital expenditures, both of which are logged and detrended using a quadratic trend at the firm level.<sup>8</sup> As a result,  $\beta_2$

<sup>3</sup> Source: <https://www.nytimes.com/2014/03/28/world/europe/General-Assembly-Vote-on-Crimea.html>. Retrieved Jun 21, 2024.

<sup>3</sup> Source: <https://www.nytimes.com/2014/03/28/world/europe/General-Assembly-Vote-on-Crimea.html>. Retrieved Jun 21, 2024.

<sup>4</sup> To explicitly avoid the possibility that Russian firms intentionally engaged in risk-sharing via this first level, thereby confounding our identification strategy, we exclude connections to nations friendly with Russia.

<sup>5</sup> By counting countries that vote in favor of Russia in both sanction waves, we can avoid the issue of whether the 2014 sanction itself led to a country switching allegiance.

<sup>6</sup> These documents include, but are not limited to, the lists of companies and individuals sanctioned by the US, provided by the Office of Foreign Assets Control (OFAC), or the lists of persons and entities affected by EU sanctions as outlined in Council Decision 2014/145/CFSP.

<sup>7</sup> Source: <https://www.nytimes.com/2014/03/28/world/europe/General-Assembly-Vote-on-Crimea.html>. Retrieved Jun 21, 2024.

<sup>8</sup> Specifically, for each firm  $i$ , we consider the following regression to compute the trend  $Y_{it} = \alpha_i + \beta_{1i} \times t + \beta_{2i} \times t^2 + \varepsilon_{it}$ , the predicted value of which is subtracted from the raw log values for  $Y_{it}$  to obtain the de-trended values used in the empirical analysis.

**Table 1**  
How risk-sharing alleviates the impacts of 2014 Sanction on Firm Investments.

	Tangible assets		Capital expenditures	
	(1)	(2)	(3)	(4)
Sanction 2014 × Lagged Relations	0.321* (0.181)	0.430*** (0.165)	0.738** (0.287)	0.679** (0.289)
Lagged Relations	0.086 (0.157)	−0.080 (0.143)	−0.421 (0.260)	−0.489* (0.267)
Sanction 2014	0.068 (0.076)	−0.167** (0.069)	0.694*** (0.094)	0.482*** (0.089)
Lagged Leverage		0.011 (0.059)		−0.296*** (0.080)
Lagged Dividends		0.222 (0.157)		2.533*** (0.434)
Constant	0.929*** (0.094)	1.105*** (0.096)	0.425*** (0.115)	0.718*** (0.110)
Firm FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
Adj-R2	0.897	0.923	0.838	0.857
Obs.	9,404	8,208	9,173	8,181

**Notes:** This table presents the estimates for Eq. (1). All variables are defined in the Appendix. The estimation includes firm and year fixed effects. Robust standard errors are shown in parentheses. Significance levels are denoted as follows: \* for  $p < 0.10$ , \*\* for  $p < 0.05$ , and \*\*\* for  $p < 0.01$ .

captures the effects of risk-sharing exposure after the 2014 sanction on the deviations of  $Y_{it}$  relative to the trends.  $\mathbb{X}_{it-1}$  indicates our control variables, including one-lagged firm leverage (i.e., the ratio of total debt to total assets in year  $t-1$ ) and one-lagged firm dividends (i.e., the ratio of total cash dividends to total assets in year  $t-1$ ).

### 2.3. Data

We gather data on global supply chain relations from the FactSet Revere database, which has been employed in recent studies to capture both domestic and international supply chain relations (Jiao and Sarkissian, 2021). As shown in Fig. 1, based on information of the relation types, start date, end date, and country codes from the FactSet Revere, we identify first-level intermediate firms and the second-level business partners that Russian firms annually have business relations with. We focus on the indirect relations and compute our main risk-sharing variable as the number of second-level relations with partners from friendly countries divided by the total number of relations. Firm-level financial/accounting data, including firm investments, leverage, and dividends, are collected from Factset Fundamentals covering 2003–2023. Our sample after merging data between FactSet Revere and FactSet Fundamentals is 9735 firm-year observations (i.e., 241 unique Russian firms) between 2003 and 2023.<sup>9</sup> We describe our data in detail in the online Appendix.<sup>10</sup>

## 3. Results

### 3.1. Risk-sharing, sanctions, and firm investments in 2014

Table 1 presents our baseline results for Eq. (1), where we find that Russian firms who had established relations with supply chain partners from friendly countries tend to increase investments in tangible assets and capital expenditures post-2014 sanctions. Our results suggest that such a risk-sharing channel helps firms overcome the impact of the sanctions. Given the sanctions starting in 2014, a one-percent increase in lagged relations induces approximately a 0.43% increase in tangible assets relative to firms without access to this risk-sharing channel

(Columns 1–2), while this effect is 0.68% for total capital expenditures in the post-sanction period (Columns 3–4).

Fig. 2 presents the coefficient plot for the interaction terms in Eq. (1). We expect the  $\beta_2$  values to be indistinguishable from zero before the sanction. The pre-trends are flat, and we observe positive trend breaks in both variables, *Tangible Assets* and *Capital Expenditures*, after 2014 for firms with more relations. We observe no significant pre-trend for either outcome, which aligns with our initial hypothesis that the risk-sharing channel activates a protective mechanism for Russian firms. Despite severe sanctions, this mechanism allows firms to increase their capital expenditures and invest in tangible assets.

### 3.2. Sources and nature of risk-sharing matter

#### 3.2.1. Risk-sharing effects by countries

Intuitively, Russian firms can diversify sanction risks via countries with varying access to the global market; such variations in sanction exposure can determine how effective the risk-sharing channel is. We estimated Eq. (1) within a sub-sample analysis and plotted the coefficients in Fig. 3. In particular, we considered subsamples that include indirect relations where the second-level partner firms are from Russia's top trading partners.<sup>11</sup> One might argue that firms impacted by sanctions are more likely to do businesses with non-sanctioned nations, some of which maintain strong trade connections with the sanctioned country (Besedeš et al., 2021).

This approach naturally leads us to consider a subset of indirect relations where the second-level partner firms from China, India, or other countries (see Fig. 1). We found that the risk-sharing channel of Russian firms is most effective if the relations are with firms in India, with the estimates of  $\beta_2$  for both tangible assets and capital expenditures significantly positive at the 5% level. However, we only find a marginal effect for other countries and China, with a 10% significance level for capital expenditures. We find no effect on tangible assets or capital expenditures should the sample be restricted to second-level partner firms not in India or China.

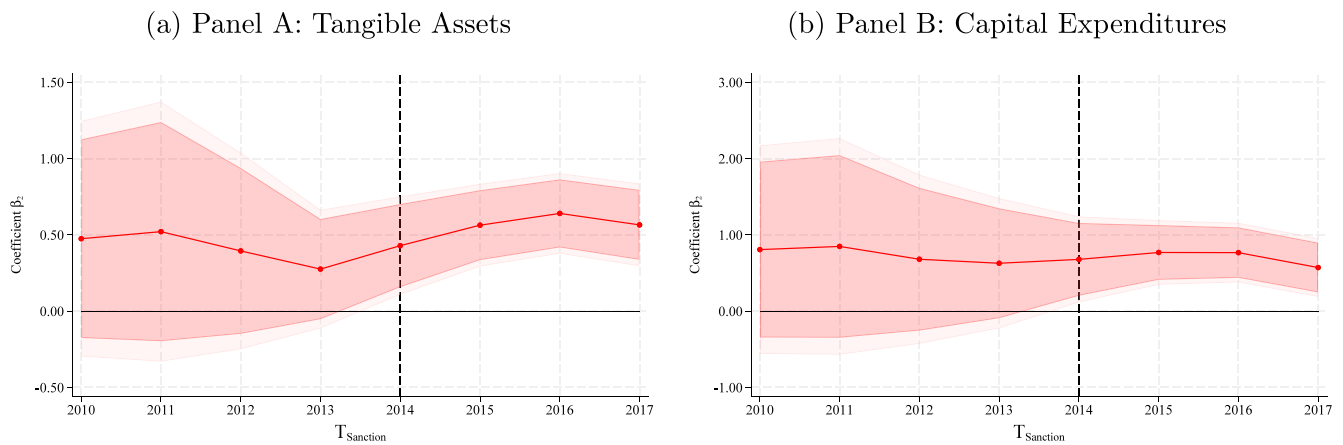
#### 3.2.2. Excluding the feedback effects of sanctions

Since firms might change business ties after receiving sanctions, the previous estimate might not disentangle the effects of risk-sharing before and after sanctions. We account for such feedback by excluding

<sup>9</sup> The observation number varies across different regressions due to the data availability for the variables of interest.

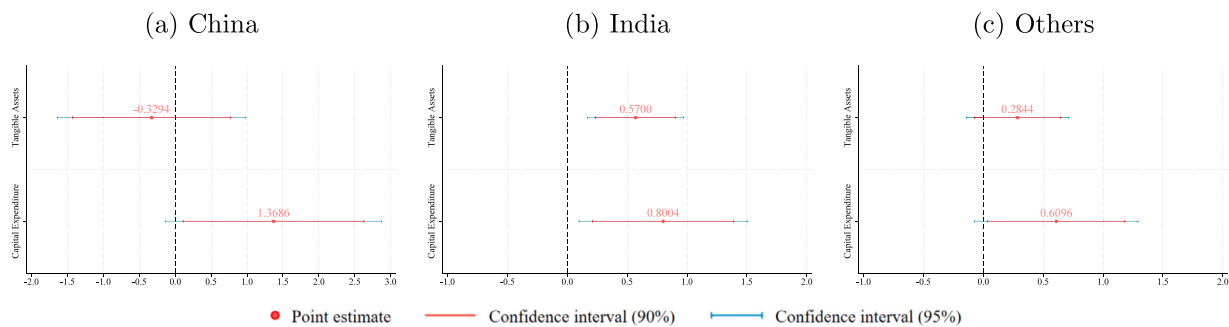
<sup>10</sup> In the online Appendix, we present first-level and second-level relations, as well as the descriptive statistics. We conduct a number of exercises where we calculate relations with specific trading partners or removing countries that are also sanctioned in 2014.

<sup>11</sup> The top trading partners for Russia in 2017 by export value were India and China. Source: <https://oec.world/en>. Last retrieved: July 29, 2024.



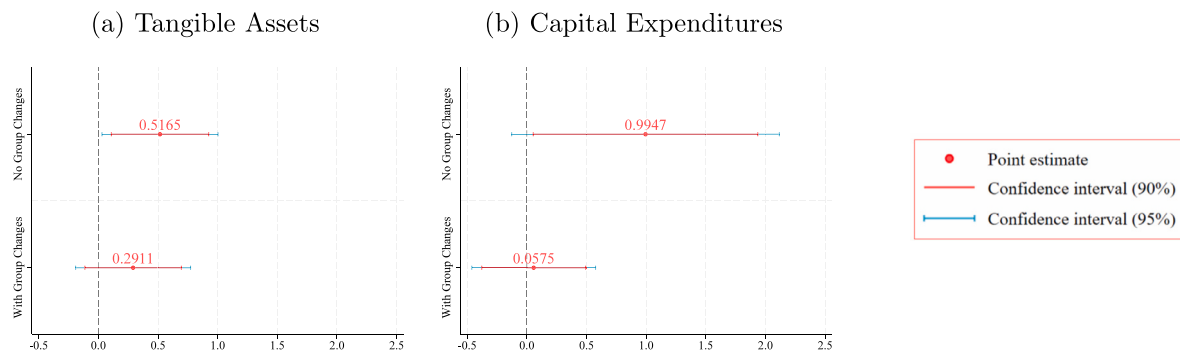
**Fig. 2.** Risk-sharing effects ( $\beta_2$ ) by sanction timing.

**Notes:** The figure displays the regression coefficients for the interaction between the lagged relations and time period dummies, along with 90% (darker) and 95% (lighter) confidence intervals. Standard errors are robust, and the model includes all control variables.



**Fig. 3.** Risk-sharing effects ( $\beta_2$ ) by countries of partner firms.

**Notes:** The figure displays the regression coefficients for the baseline results, considering the sub-sample of partner firms located in China, India, or other countries. Standard errors are robust, and the model includes all control variables.



**Fig. 4.** Risk-sharing effects ( $\beta_2$ ) by whether the number of relations changes after 2014.

**Notes:** The figure displays the regression coefficients for the baseline results, considering whether Russian firms choose to increase or maintain their risk-sharing relations before 2014. Standard errors are robust, and the model includes all control variables.

firms that change the number of relations after the 2014 sanction. In particular, we re-estimate Eq. (1) for firms whose number of relations change after 2014 and for firms whose number of relations do not and plot the coefficient on the risk-sharing effects ( $\beta_2$ ) in Fig. 4. In Fig. 4, the dependent variables are tangible assets and capital expenditures in the left and right panels, respectively. Overall, we find significant effects on both tangible assets (at the 5% level) and capital expenditures (at the 10% level) for firms that do not experience a change in the fraction of indirect relations with other firms from friendly nations. This result further highlights the importance of having access to risk-sharing *ex-ante* in alleviating the effects of sanction.

### 3.2.3. Risk-sharing and financial frictions

Following [Hennessy and Whited \(2007\)](#) to use low-dividend as a proxy for high financing frictions, we explore how risk-sharing plays a role in alleviating the adverse effects of higher financial frictions for Russian firms *ex-post*. Table 2 shows that firms subject to higher financing frictions are more likely to be able to leverage risk-sharing to diversify away from sanctions to increase their investments. Accordingly, firms may encounter challenges in obtaining bank loans due to restrictions ([Efing et al., 2023](#)), which supports our use of low-dividend payout as a proxy for financial frictions.

**Table 2**  
Financial friction channel: Low-dividend firms.

	Tangible assets (1)	Capital expenditures (2)
Lagged Low Dividends $\times$ Sanction 2014 $\times$ Lagged Relations	0.841* (0.480)	1.764* (0.907)
Sanction 2014 $\times$ Lagged Relations	−0.724*** (0.157)	−0.751*** (0.197)
Lagged Low Dividends $\times$ Lagged Relations	−0.717 (0.447)	−1.706* (0.876)
Lagged Low Dividends $\times$ Sanction 2014	−0.275*** (0.038)	−0.497*** (0.055)
Lagged Relations	0.750*** (0.136)	0.685*** (0.170)
Sanction 2014	−0.051** (0.023)	0.052* (0.029)
Lagged Low Dividends	0.090*** (0.029)	0.055 (0.042)
Lagged Leverage	0.256*** (0.069)	−0.143* (0.083)
Constant	0.024 (0.027)	0.162*** (0.032)
Firm FE	Yes	Yes
Year FE	Yes	Yes
Adj-R2	0.902	0.836
Obs.	8,815	8,654

**Notes:** The regression specification considered is  $Y_{it} = \alpha + \beta_1 \mathbb{I}(t \geq T_{\text{Sanction}}) \times \mathbb{R}_{it-1} \times \text{Low-Dividends}_{it-1} + \beta_2 \mathbb{I}(t \geq T_{\text{Sanction}}) \times \text{Low-Dividends}_{it-1} + \beta_3 \mathbb{I}(t \geq T_{\text{Sanction}}) \times \mathbb{R}_{it-1} + \beta_4 \text{Low-Dividends}_{it-1} \times \mathbb{R}_{it-1} + \beta_5 \mathbb{I}(t \geq T_{\text{Sanction}}) + \beta_6 \mathbb{R}_{it-1} + \beta_7 \text{Low-Dividends}_{it-1} + \theta_{it-1}^x + \gamma T_i + \xi \Xi_i + \varepsilon_{it}$ . Here  $\text{Low-Dividends}_{it}$  is one if firm  $i$ 's dividends are lower than the median of all firms and zero otherwise. All variables are defined in the Appendix. The estimation includes firm and year fixed effects. Robust standard errors are shown in parentheses. Significance levels are denoted as follows: \* for  $p < 0.10$ , \*\* for  $p < 0.05$ , and \*\*\* for  $p < 0.01$ .

### 3.3. Robustness

The Online Appendix includes further robustness checks. Specifically, we examine the baseline results using the 2022 sanction, assess the impacts of risk-sharing channels on other firm outcomes often considered in the literature, and consider a counterfactual exercise using direct relations. While we do not find significant results for the 2022 sanction, such a null result might be attributable to the contemporary nature of such an event and the resulting lack of data. Additional robustness checks include randomly assigning risk-sharing relations, using different de-trending methods, and using the ratio of second-level alliance relations relative to the total first-level relations instead of our benchmark measures of risk-sharing exposure, among others. Furthermore, as the number of business relations may change due to the 2014 sanction, we removed partners in friendly countries that started to be sanctioned in 2014. All in all, our results remain consistent across these checks.

### 4. Conclusion

Leveraging Russian firms' indirect business ties with partners in friendly nations as a plausibly exogenous proxy for these firms' ability to diversify sanction risks, we offer a novel explanation for why sanctions on Russian firms might be ineffective. Specifically, Russian firms were able to leverage these indirect business ties to alleviate the impacts of the 2014 sanction through higher investments and an increase in tangible assets.

From a policy perspective, such a result highlights the importance of accounting for the risk-sharing channel of sanctions from both the perspectives of the sanctioned and sanctioning states. In particular, sanctioning states should consider how to prevent firms located in sanctioned states from effectively leveraging such a channel.

### Data availability

Data will be made available on request.

### Appendix A. Supplementary data

Supplementary material related to this article can be found online at <https://doi.org/10.1016/j.econlet.2024.112005>.

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