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Conflict and Intergroup Trade: Evidence from the 2014 Russia-Ukraine Crisis[†]

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Does armed conflict reduce trade, even in noncombat areas, through the destruction of intergroup social capital? We analyze Ukrainian trade transactions before and after the 2014 Russia-Ukraine conflict. In a difference-in-differences framework, we find that Ukrainian firms from districts with fewer ethnic Russians experienced a deeper decline in trade with Russia. This decline is economically significant, persistent, and can be explained by erosion of intergroup trust. Affected Ukrainian firms suffered a decrease in performance and diverted trade to other countries. Our results suggest that, through social effects, conflict can be economically damaging even away from combat areas. (*JEL* D74, F14, F51, J15, P31, P33, Z13)

Assessing the economic consequences of conflict is a central problem in development economics and political economy. Past studies have thoroughly examined the multifaceted effects of direct exposure of individuals to violence (Blattman and Miguel 2010). Potential ramifications of conflict, however, may also extend to areas not directly experiencing combat. This points to a considerable gap in the literature, given that at least 2.66 billion people live outside the war zones of their

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own conflict-ridden countries.[1] In addition, if noncombat areas are affected, the traditional estimates obtained by comparing regions with and without violent events within the same country (e.g., Abadie and Gardeazabal 2003) may differ from the total economic costs of conflict.

We focus on one important indirect consequence of conflict: namely, its impact on intergroup trade. Recent theoretical research hypothesizes that wars may reduce trade not only by destroying physical capital but also by elevating out-group hostility and eroding intergroup trust (Rohner, Thoenig, and Zilibotti 2013b).[2] And yet, finding empirical evidence of the latter effect has been challenging. This is partly because conflict-ridden countries do not possess high-quality microlevel data on trade, and partly due to a lack of credible identification strategies that would allow one to disentangle the rise of intergroup tensions from the physical effects of violence. Using transaction-level trade data and focusing on noncombat areas, this paper is the first to document the breakdown of trade through the conflict-induced erosion of intergroup relations. Further, we explore whether such disruption is lasting and economically meaningful, and we study the underlying mechanisms.

The 2014 Russia-Ukraine conflict provides a natural laboratory for this study. First, armed combat in this context has been isolated to a few locations; most Ukrainian territory and a large part of the Russia-Ukraine border have not been affected by violence. This feature allows us to focus on noncombat areas and abstract from such direct effects as the destruction of physical capital. Second, since it has been a proxy conflict as opposed to a full-fledged war, trade has not ceased nor has the tariff environment changed.[3] In fact, Russia has remained Ukraine's largest trading partner. This allows us to analyze Russia-Ukraine trade transactions even after the start of the conflict. Finally, given the ethnically charged nature of the conflict, the presence of a large, spatially dispersed Russian minority within Ukraine allows us to isolate the impact on trade between ethnic groups. We complement these features with new data on the universe of international trade transactions of all Ukrainian firms from 2013 through 2016 in tandem with firms' balance sheets and census characteristics of their home districts.

To causally establish whether trade was disrupted along ethnic lines after the start of the conflict, we employ a difference-in-differences identification strategy. We compare outcomes before and after the onset of conflict in February 2014 across Ukrainian districts (*raions*) with a higher versus lower percentage of ethnic Russians. In this specification, firm fixed effects control for time-invariant differences across regions, such as geographic characteristics, or slow-moving features, such as culture. Time-period fixed effects control for changes that affect all regions

[1] As of 2016, conflict-ridden countries contain 50 percent of the world's population (Bahgat et al. 2018, p.19). At the same time, the number of people living within a 50-kilometer radius of conflict events is estimated to be 840 million, or 12 percent of the world's population (Bahgat et al. 2018, p.21). This means that at least 2.66 billion people live in countries with an ongoing conflict but are not affected by violence directly.

[2] For the purposes of this paper, we unify these two objects—i.e., accumulated stock of affinity and trust between social groups—under the label of "intergroup social capital." This concept is close to the "bridging" social capital by Putnam (2001) defined as social capital between groups, in contrast to the "bonding" or intra-group social capital.

[3] As members of the Commonwealth of Independent States Free Trade Agreement (CISFTA), Russia and Ukraine continued to have zero tariffs on a vast majority of goods. Tariffs went up only in January 2016, when Russia and Ukraine ceased to respect CISFTA regulations regarding each other. Our results are robust to excluding the 2016 data.

similarly, such as macroeconomic changes in Ukraine or trade restrictions that affect Russia-Ukraine trade as a whole. Our identification strategy assumes that, absent the conflict, firm trade patterns in areas with varying presence of ethnic Russians would have evolved along parallel trends. Later in the paper, we present evidence supporting this parallel-trends assumption.

Before the main analysis, we provide some descriptive statistics to support our conjecture that conflict led to a dramatic rise of nationalism along ethnic lines. Using survey data on social attitudes of the general population, we show that, within Ukraine and outside of the combat areas, antipathy toward Russia skyrocketed immediately after the occupation of Crimea, but significantly less so among ethnic Russians and in more ethnically Russian provinces. Moreover, the differences in attitudes across ethnicity remained wide throughout the period of our analytical interest.

The key finding of the present study is that a decline in trade between Ukrainian firms and Russia was differential depending on the ethnic composition of the firms' home areas. That is, we find that firms located in less ethnically Russian districts of Ukraine decreased their trade with Russia by a larger margin.[4] According to our estimates, moving an average firm from a district comprising 17.7 percent ethnic Russians (seventy-fifth percentile) to a district comprising 9.7 percent ethnic Russians (twenty-fifth percentile) would deepen the decline in monthly probability of trade with Russia by 10 percent and the monthly volume of trade with Russia by 11 to 12 percent.[5] Month-by-month estimates report no evidence of pretrends and indicate that the effect remains large and significant three years after the start of the conflict. Our back-of-the-envelope calculations suggest that this indirect effect may have accounted for a total loss of up to US$1 billion in mutual trade, equivalent to 2.5 percent of the preconflict Russia-Ukraine trade volume.

Next, we examine the mechanisms through which conflict reduces intergroup trade in noncombat areas. Our central claim is that conflict damages intergroup social capital—i.e., goodwill between social groups accumulated over the course of history—which may then disrupt intergroup trade. Deterioration of intergroup social capital manifests itself through the following channels. First, conflict may lead to erosion of trust between trading partners, as well as to individual-level animosity between key decision-makers. Second, it may affect the attitudes of the general population, leading to a decline in consumer demand for the other group's products and reputational damage to firms trading with the enemy. Finally, conflict may induce bias on the part of government bureaucrats at the border. Overall, we find strong support for erosion of trust and some evidence in favor of consumer action and reputational pressure on Ukrainian firms. We find no evidence in favor of the individual-level animosity channel or ethnic-based discrimination at the border.

To investigate the trust channel, we highlight variation in contracts used by firms and the corresponding timing of payments. There are two major types of contracts in international trade: open account (OA) contracts, in which exporters are paid

[4] Overall, the conflict has had a detrimental effect on trade between Russia and Ukraine. The percentage of Ukrainian exports to Russia plummeted after the start of the conflict from 25.7 percent in 2012 to 9.9 percent in 2016. Likewise, the share of Russian goods among all Ukrainian imports fell from 32.4 percent in 2012 to 13.1 percent in 2016. Still, the countries remained important trading partners.

[5] Similar results are observed for the share of the district population that considers Russian its mother tongue.

after goods are delivered, and cash-in-advance (CIA) contracts, in which exporters are paid before goods are shipped. To circumvent the lack of information on contracts in our dataset, we use product-level data on trade contracts between Russian, Ukrainian, and Turkish firms from 2004 through 2011. These data allow us to measure predicted types of contracts used by firms based on the products they traded. We show that the differential effect of conflict across ethnicity is larger for Ukrainian exporters with a higher likelihood of using OA contracts, which leave them exposed to the risk of nonpayment. Conversely, the differential drop in trade is more pronounced for importers with a higher likelihood of using CIA contracts, leaving them vulnerable to the risk of never receiving the product in question. Finally, using within-firm variation, we show that firms in less ethnically Russian areas of Ukraine shift their trade from more to less trust-intensive products based on the OA/CIA classification. The above suggests that a differential decline in trust indeed plays a role in our results, providing incentives for Ukrainian firms from less ethnically Russian areas to stop trading with Russian firms.

We find some evidence in favor of consumer action and reputational pressure. As evidence for consumer action, we show that the differential effect is more pronounced for firms trading consumer goods than for those trading intermediate goods. Furthermore, using Google Trends data, we show that the word *boycott* was significantly more popular in online searches in regions with fewer ethnic Russians and that the differential effect of conflict is stronger in regions where *boycott* searches were more prevalent. These findings are consistent with the qualitative evidence documenting that 40 to 50 percent of Ukrainians reported taking part in a boycott campaign against Russian products in 2014 and 2015. Nevertheless, consumer boycotts cannot be the only explanation as our baseline estimates are also present for intermediate products and exports. Albeit more suggestive, we also document an ample body of anecdotal evidence consistent with the reputational pressure faced by large Ukrainian firms. We present indirect evidence supporting this hypothesis, showing that the differential effect for intermediate products comes almost entirely from large firms, which are traditionally viewed in the literature as more susceptible to activism and which can afford corporate social responsibility initiatives (Perrini, Russo, and Tencati 2007; Smith 2013).

We find no support for other mechanisms that might a priori be at work. Our results indicate that firms with different shares of Russian-surnamed managers and owners do not differ in their reaction to the conflict. Instead, the local share of ethnic Russians starts to play a role only when the key decision-makers within the firm do not have strong markers of cultural and ethnic ties with Russia. These results are less consistent with the animosity channel but are in line with the information- and trust-based interpretation (Rohner, Thoenig, and Zilibotti 2013b; Guiso and Makarin 2020). Finally, we find no evidence of discrimination at the border, as there is no differential effect for trade between Ukrainian firms and Kazakhstan, which must pass through the Russia-Ukraine border.

The final part of this paper takes full advantage of the granularity and richness of our data to investigate how firms respond to the reduction of trade with Russia. First, we show that the breakdown of trade along ethnic lines has indeed been costly for Ukrainian firms. In a triple-difference specification with *all* Ukrainian firms, not only those that engaged in international trade, we show that firms trading with

Russia before the start of the conflict yet located in less ethnically Russian areas of Ukraine experienced a greater loss of sales, profits, and productivity relative to their counterparts. In addition, we document that firms accommodated this shock by trading with other countries. For instance, we find that firms from less Russian areas differentially increased their trade with Turkey and Poland. Furthermore, the baseline effect is strongest for Ukrainian firms with the lowest switching costs. Overall, these results suggest that conflict-induced decline in intergroup trade has serious economic implications for firms and their trade network.

We consider and rule out the main alternative explanations for our baseline results. The first concern is that less ethnically Russian areas of Ukraine may be affected by the conflict differently because they are farther from the Russia-Ukraine border. We account for this possibility by including highly flexible controls for firms' road and railway distance to the Russian border. The second concern is that areas with a smaller Russian minority could have specialized in products that have been disproportionately affected by the conflict and subsequent events. We address this concern by including the product-post fixed effects in a granular firm-product-month-level specification. Finally, one may also conjecture that firms in more Russian areas took a smaller overall economic hit as a result of the conflict. For instance, it could be that these areas hosted more refugees, which may have generated positive demand and labor supply shocks. We show that this is not the case in a triple-difference, multicountry specification in which trade with other countries allows us to include the district-post fixed effects.[6]

We add to the literature on the microeconomic consequences of intergroup frictions caused by armed conflict. Rohner, Thoenig, and Zilibotti (2013b) theoretically argue that conflict may lead to a reduction in intergroup trust and, as a result, reduce trade even in noncombat areas.[7] Some previous studies find that conflict lowers trust (Nunn and Wantchekon 2011; Cassar, Grosjean, and Whitt 2013; Rohner, Thoenig, and Zilibotti 2013a; Tur-Prats and Valencia Caicedo 2020)[8] and strengthens group identity at a cost of elevated out-group bias (Campante and Yanagizawa-Drott 2015; Dell and Querubin 2018). In turn, these biases curtail the productivity of interethnic teams (Hjort 2014) and lead to intergroup discrimination in institutions crucial for

[6] In all the examples given above, the robustness checks were meant to account for omitted variables correlated with the ethnic composition of Ukraine. Some of those same robustness checks, however, also address the issue of omitted events—simultaneous with but not directly related to the Russia-Ukraine conflict. For instance, the product-post fixed effects address any contemporaneous industry-specific shocks unrelated to armed conflict, such as the unilateral elimination of the EU import tariffs for Ukrainian products in April 2014. Similarly, the district-post fixed effects in a multicountry specification take care of any simultaneous local shocks that may occur due to the Ukrainian revolution (e.g., à la Earle and Gehlbach 2015). Additional robustness checks rule out a few other explanations. For instance, our results are not due to redirection of contracts by the Ukrainian government after the revolution in the spirit of Berger et al. (2013) and Fisman, Hamao, and Wang (2014), as we show that state-owned firms are not driving our results.

[7] Previous research has shown that, in addition to formal rules, trade relies on trust and informal norms (Nunn 2007; Guiso, Sapienza, and Zingales 2009; Jha 2013), which are, in turn, easier to sustain within groups of similar ethnicity (Greif 1993; Fershtman and Gneezy 2001; Rauch and Trindade 2002). Note, however, that the causal microlevel estimates of the impact of intergroup trust on trade are still lacking. The best available evidence is at the cross-country level (e.g., Guiso, Sapienza, and Zingales 2009). However, as recent studies in international trade illustrate (e.g., Simonovska and Waugh 2014a, b), trade elasticities calculated from disaggregated data can differ substantially from the country-level estimates (Eaton and Kortum 2002).

[8] This causal link is not straightforward, as the literature finds generally positive effects on the association between exposure to war and social capital (Bauer et al. 2016). Further, it remains unclear whether conflict triggers a decline in intergroup trust also in areas away from the violent events.

economic activity, such as courts (Shayo and Zussman 2011), stock exchanges (Moser 2012), and banks (Fisman et al. 2019). We complement this literature by establishing a full causal link from conflict to intergroup trade, thus combining existing theoretical insights of Rohner, Thoenig, and Zilibotti (2013b); empirical evidence on conflict and trust; and detailed microlevel data on interfirm transactions.

We also contribute to the literature on armed conflict and firms, which remains sparse. Our paper is the first to document a negative impact of conflict on business transactions and firm performance in noncombat areas. Previous studies on the economic effects of conflict on firms focused almost entirely on the direct effects of violence. Guidolin and La Ferrara (2007) provide time-series evidence that a breakout of civil war in Angola decreased the stock-market value of firms operating in the country. Ksoll, Macchiavello, and Morjaria (2014) analyze the effect of violence on nearby exporters in Kenya that resulted, among other things, in a sharp increase in worker absence. Amodio and Di Maio (2018) show that Palestinian firms in violent areas substituted domestically produced materials for imported ones during the Second Intifada.[9]

The rest of the paper is organized as follows. Section I gives the historical background on ethnic divisions in Ukraine and on Russia-Ukraine trade. Section II describes the empirical strategy and the data. Section II displays our baseline difference-in-differences results, rules out some of the alternative explanations, and offers additional robustness checks. Section IV studies the mechanisms behind our baseline results. Section V describes some implications for firms. Section VI concludes.

I. Background

A. *Ethnic*, *Cultural*, *and Political Divisions within Ukraine*

Historically, many regions of Ukraine have had a sizable ethnic Russian minority. The number of Russians in Ukraine substantially increased during the Soviet era, reaching its peak—11.3 million, or 22.1 percent of the population—in 1989. This share decreased after the fall of the Soviet Union, down to 17.2 percent by 2001, but the country's ethnic and cultural divide was still pronounced, spilling over into the political sphere.[10]

Figure 1 displays the geographical variation in the share of ethnic Russians across Ukrainian districts (*raions*).[11] In Western Ukraine, many districts had few ethnic Russians, often less than 1 percent. Central and Southern Ukraine had a sizable

[9] Although this paper is focused on armed conflict, it is related to the literature on political disputes and consumer boycotts (Ashenfelter, Ciccarella, and Shatz 2007; Fouka and Voth 2016; Heilmann 2016; Pandya and Venkatesan 2016; Chen 2020), as well as the resulting breakdown of business-to-business trade (Michaels and Zhi 2010; Fisman, Hamao, and Wang 2014). Note, however, that even though we present some evidence consistent with consumer action, the latter cannot explain our findings on its own, as our baseline effects are also present for exports of intermediate products.

[10] For a detailed discussion of the USSR's ethnic policies in Ukraine and the 1932-1933 Soviet Great Famine, see Markevich, Naumenko, and Qian (2021).

[11] These data come from the latest census of the Ukrainian population, concluded in 2001 (State Statistics Committee of Ukraine 2001). The Ukrainian government has not conducted a census since then, due to financial issues.

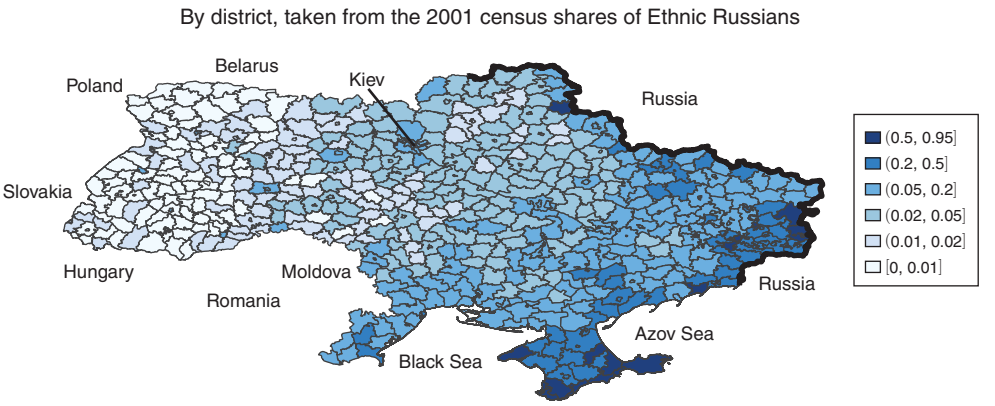

FIGURE 1. SHARES OF ETHNIC RUSSIANS

Notes: This figure maps the distribution of the share of ethnic Russians across Ukrainian districts (*raions*). Data are from the latest census of Ukrainian population, conducted in 2001 (State Statistics Committee of Ukraine 2001). The thick black line represents the border between Ukraine and Russia.

Russian population, varying from 1 percent to 20 percent. Finally, the eastern part of the country had the highest share of ethnic Russians; some areas in Crimea and Donbas had a Russian majority. Use of the Russian language exhibited a similar geographic divide: in 2001, 29.6 percent of Ukrainian citizens considered Russian their mother tongue and approximately 60 percent used it at home on a daily basis, with substantial heterogeneity across regions.[12]

The ethnic and cultural divide manifested itself in a constant political battle between the Ukrainian west and the "Russian" east prior to 2014. The western part of the country traditionally supported pro-European and nationalistic political candidates, while Eastern Ukraine generally supported pro-Russian candidates. Figures A2 and A3 in the online Appendix illustrate this political polarization, showing strikingly segregated voting patterns in the 2004 presidential elections (second round) and the 2012 parliamentary elections. This political divide, fueled by foreign interference (Kuzio 2005; Shulman and Bloom 2012), has been stirring the political instability in the country. During the Orange Revolution of 2004, the pro-European Victor Yushchenko beat the pro-Russian candidate, Victor Yanukovych, to become president of Ukraine from 2005 to 2010. However, Yanukovych won in 2010 and was president until the revolution in February 2014, when he lost power and was replaced first by an interim president, Oleksandr Turchynov, and ultimately by Petro Poroshenko, who was elected president on May 25, 2014 and served in this role until May 20, 2019.[13]

[12] See Figure A1 in the online Appendix for the geographic distribution across Ukrainian districts of the percentage of people who consider Russian their mother tongue.

[13] The preconflict pattern of political transitions is highly consistent with the conflict literature that would predict that ethnic and linguistic divisions coupled with the centralized structure of the Ukrainian state could lead to a tug-of-war and, eventually, social conflict (Esteban and Ray 2008, 2011; Esteban, Mayoral, and Ray 2012).

B. *The 2014 Russia-Ukraine Conflict*

The transition of power to (now former) President Poroshenko was a result of the 2014 Ukrainian revolution. In November 2013, President Yanukovych walked back his promise to enter a political and economic association with the European Union. This step led to massive protests in Kyiv and their violent suppression by Yanukovych's police forces, on November 29, 2013. Protests spread across the country over the next several months. After several deadly clashes between protesters and the police, Yanukovych fled to Russia on February 22, 2014; at that point, the revolution had succeeded.

In response, the Russian government decided to occupy Crimea and started promoting separatist movements in Eastern Ukraine, justifying its actions by saying it needed to protect the ethnic Russian minority. The decision to occupy Crimea was made secretly by Vladimir Putin and a handful of senior security advisors; it took everyone else by surprise (Treisman 2018). Although it was widely understood that the military units in Crimea bearing no identifying markings were Russian, the occupation of Crimea was a covert operation and did not lead to a formal war. Putin did not admit Russian involvement until April 2014. The annexation of Crimea, in late February to early March 2014, occurred with little to no direct military conflict and a single-digit number of casualties (Walker and Traynor 2014).

Soon, pro-Russian protests ensued in the Donetsk and Luhansk provinces (i.e., the Donbas region). Eventually, part of these provinces proclaimed independence from Ukraine, forming the Donetsk People's Republic (DPR) on April 7, 2014, and the Luhansk People's Republic (LPR) on April 27, 2014. In response, the new acting Ukrainian president launched an "antiterror" operation against these separatist movements. Russia started supporting the DPR and the LPR, providing military power and expertise, among other things (Kofman et al. 2017). A long-lasting violent conflict ensued, leading to more than 13,000 casualties (as of December 2018) and the displacement of hundreds of thousands of people. Using nighttime luminosity data, researchers have documented that the separatist rule led to a 40–70 percent economic decline in the Donbass area (Coupé, Myck, and Najsztub 2016; Kochnev 2019).

Figure 2 shows the areas directly affected by the conflict. These include Crimea (in light red at the bottom) and the two quasi-independent states of the DPR and the LPR (in dark red). We exclude firms located in these regions from our analysis. We also do not consider firms located in the rest of the Donbas region (in light red to the right). We do this because these areas were located next to the war zones and could have been facing some violence or severe uncertainty about whether they would face violence in the future. While the military action was concentrated in some parts of the DPR and LPR territories, the rest of the country and the rest of the territories along the Russia-Ukraine border was not exposed to violence directly (Smith 2020).

C. *Russia-Ukraine Trade*

Since the fall of the Soviet Union, Russia and Ukraine have been major trading partners. In September 2012, together with eight other post-Soviet nations, the two countries formed the CISFTA. Under CISFTA, all export and import tariffs were set to zero, with few exceptions. The tariffs went up only in January 2016, two years

FIGURE 2. CONFLICT AREAS

Notes: The figure highlights the areas directly affected by the Russia-Ukraine conflict. The Crimean Peninsula, in light red at the bottom, was occupied by Russia in early 2014. The DPR and LPR territories, in dark red, have been the areas of armed conflict since April 2014. The Donbas area, in light red on the right side of the graph, consists of the Donetsk and Luhansk provinces. Our analysis in this paper focuses on the rest of the country, in white, excluding the areas mentioned above. The thick black line represents the border between Ukraine and Russia.

after the start of the conflict, when Russia and Ukraine stopped respecting CISFTA regulations regarding trade with each other.[14]

In terms of transportation method, the majority of the Russia-Ukraine trade is conducted on the ground. Although our data on this aspect is limited, according to the nonmissing indicators, in 2013, 70 percent of trade was conducted by truck and 25 percent by train. The remainder was conducted 3 percent by air and 2 percent by sea. Figures B1 and B2 in online Appendix B display the location of road and railway customs checkpoints, respectively, as well as the network of roads and railways in Ukraine.

The conflict led to a massive shock to Russia-Ukraine trade. The percentage of Ukrainian exports going to Russia plummeted after the start of the conflict, from 25.7 percent in 2012 to 9.9 percent in 2016. Likewise, the share of Russian goods among all Ukrainian imports fell from 32.4 percent in 2012 to 13.1 percent in 2016. Despite such a severe decline, Russia remained Ukraine's largest trading partner.[15] Notably, the volume of Russia-Ukraine trade increased in 2017 relative to 2016, marking the first annual increase since the start of the conflict.

Throughout the period of our study, Russia-Ukraine trade was taking place in a generally weak institutional environment with poor contract enforcement. At the

[14] In January 2016, Ukraine formally entered the economic association with the European Union, which lowered tariffs for both parties. Earlier, in late April 2014, the European Union had unilaterally eliminated import tariffs for Ukrainian goods as an act of diplomatic and economic support. Our results are robust to the inclusion of product-specific post-conflict fixed effects, which would absorb the impact of any changes in tariffs. See Section IIIB for details.

[15] The role of Ukraine in Russian international trade also declined but remained significant. Ukraine was the fifth-largest exporter to Russia in 2011, with 5.8 percent of all goods imported to Russia coming from Ukraine. This share dropped to 2.3 percent after the start of the conflict—by 2014, Ukraine had become the eleventh-largest exporter to Russia.

time, Russia and Ukraine scored close to the bottom in the worldwide rule-of-law rankings, including regulatory enforcement and civil justice subindices.[16] One may wonder if trade contracts were better protected because of international regulations. In online Appendix D, we provide extensive qualitative evidence that the international arbitration process was costly, lengthy, and still subject to the idiosyncrasies of local courts. In analyzing novel, manually assembled data on international arbitration cases considered in Russian courts, we also show in online Appendix D that conflict led to a disproportionately large increase in the number of cases between Russian and Ukrainian firms and, in some specifications, a larger increase in cases involving Ukrainian firms from less Russian areas. While indicative of the magnitude of trade disruption, this has also likely triggered a decline in trust between trading partners in the two countries.

D. *Group Identity and Attitudes after the Start of the Conflict*

The Russia-Ukraine conflict abruptly changed the relationship between the two nations, as well as across ethnolinguistic groups within Ukraine. To show this quantitatively, we use survey data from Kyiv International Institute of Sociology (2013–2016) to track the changes in attitudes of Ukrainian residents toward Russia.

Figure 3 shows that Ukrainian residents had no extreme negative views toward Russia before the start of the conflict. In its immediate aftermath, however, the attitudes of ethnic Ukrainians changed dramatically. In a matter of two months, the share of ethnic Ukrainians with extreme negative views of Russia jumped from close to zero to more than a quarter of all respondents (blue line with triangles in Figure 3 panel A). This number peaked at 40 percent in May 2015. The share of ethnic Russians with similar views (red line with circles) also increased, to 8 percent in April 2014, but not as dramatically as for ethnic Ukrainians.[17] Moreover, it always stayed 20 percentage points lower than that for ethnic Ukrainians through 2016.[18]

To shed light on whether these individual differences translate into similar patterns across regions, Figure 3 panel B presents the same results broken down by whether a respondent was from a province that is more or less ethnically Russian.[19] Similar to the individual-level figure, the graph displays a stable gap in extreme negative attitudes toward Russia of about 30 percentage points between more and less Russian provinces. Since the province-level share of ethnic Russians is relatively low, at least part of this difference is driven by ethnic Ukrainians, reflecting a cultural and political divide between Ukrainian regions even among the non-Russian population.

Finally, we present these estimates in a regression form by regressing individual attitudes toward Russia on the postconflict indicator and its interaction with the share of ethnic Russians in the province of the respondent. Columns 1 and 2 of

[16] https://worldjusticeproject.org/sites/default/files/files/wjp_rule_of_law_index_2014_report.pdf.

[17] The spike in December 2014–February 2015 is likely due to a contemporaneous surge in violence in the Donbas region.

[18] Figure A4 in the online Appendix shows that all results in this section also hold as a mirror image for the share of respondents with favorable views of Russia.

[19] Province is the lowest level of geographic analysis available in this survey.

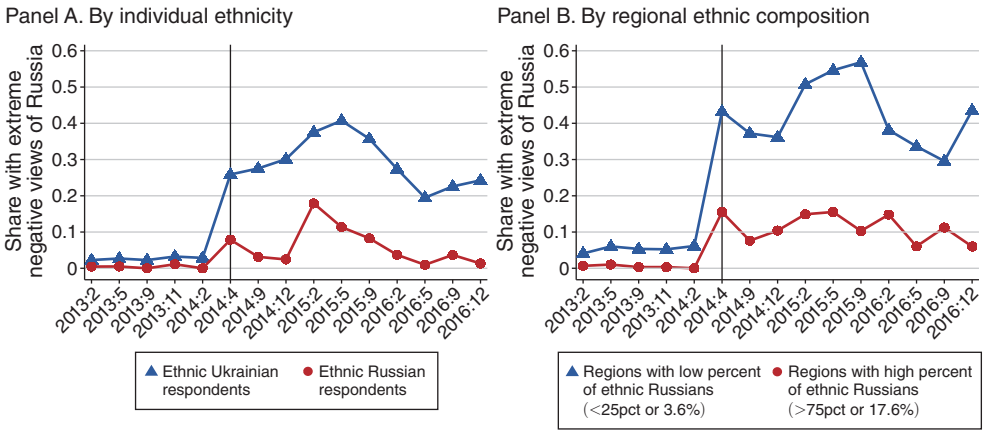

FIGURE 3. DYNAMICS OF UKRAINIANS' EXTREME NEGATIVE ATTITUDES TOWARD RUSSIA

Notes: This figure illustrates the effect of the Russia-Ukraine conflict on attitudes of Ukrainian citizens toward Russia. The *y*-axis displays the share of respondents who answered the question "What is your overall attitude toward Russia?" as "very bad." Panel A breaks down the responses by respondent ethnicity, i.e., whether an individual is ethnic Russian or ethnic Ukrainian. Panel B breaks down the responses by the ethnic composition of respondent's provinces, i.e., whether a province is below the twenty-fifth percentile (3.6 percent) or above the seventy-fifth percentile (17.6 percent) in the share of ethnic Russians. Data come from 15 nationally representative surveys conducted by Kyiv International Institute of Sociology (2013–2016). The February 2014 survey was conducted February 7 to 17, 2014, i.e., before the occupation of Crimea and the start of the conflict. The December 2015 survey did not contain the survey question of interest and, as a result, is omitted from the figures. Conflict provinces are excluded from the analysis.

online Appendix Table A2 present the results. In addition, column 3 displays the estimates for the share of respondents who would like to have closed borders and institute a visa regime with Russia. These results again confirm that anti-Russian sentiments grew significantly, especially in provinces with lower shares of ethnic Russians.

Overall, the results in Figure 3 and online Appendix Table A2 present a consistent pattern in which ethnolinguistic divisions within Ukraine translated into massively heterogeneous attitudes toward the opposite side of the conflict. These results show that, even after the occupation of Crimea and the breakout of the armed conflict in the East, there were vast disagreements across groups and regions about whether Russia and Ukraine were at war with each other. In contrast, online Appendix E shows that attitudes of Russian citizens toward Ukraine did not change differentially across Russian regions with different shares of ethnic Ukrainians.

II. Empirical Strategy and Data

A. *Baseline Specification*

The general goal of our empirical strategy is to identify the consequences of the Russia-Ukraine conflict for intergroup trade. To identify the effect of interest, we employ a difference-in-differences approach. That is, we compare firms' trade intensity with Russia before and after the start of the conflict, for firms located in

more versus less ethnically Russian districts within Ukraine (but outside the conflict areas). Specifically, we estimate the following equation:

$$Y_{idt} = \alpha_i + \delta_t + \beta \times Rus_d \times Post_t + \epsilon_{idt}, \tag{1}$$

where the outcome variable Y_{idt} is the trade intensity of firm i from district d with Russia, at year-month t; α_i and δ_t are the firm and year-month fixed effects, respectively; Rus_d is the share of ethnic Russian or native Russian-speaking population in the district d of firm i; and $Post_t$ is the post-February 2014 indicator.[20] To the extent that trade patterns for firms in more and less Russian areas would follow the same time trend absent the conflict, the coefficient β identifies the differential impact of conflict on intergroup trade.

In our baseline results, since we are interested in a firm's overall trade intensity with Russia, we study the firm's export and import transactions summed together, i.e., $Y_{idt} = Y^{exp}_{idt} + Y^{imp}_{idt}$. However, we present the results for exports and imports separately when we study the mechanisms.

Since our main right-hand-side variable, the share of ethnic Russians, is measured at the level of Ukrainian districts, we cluster the standard errors at the district level. Note, however, that our results are robust to the spatial heteroskedasticity- and autocorrelation-consistent standard errors (Conley 1999).[21]

B. *Data Sources*

Our empirical analysis combines administrative data on Ukrainian trade transactions with demographic census and firm accounting information.

The customs dataset (Ukraine 2013–2016) includes the universe of Ukrainian trade transactions with dates, weights, values (in Ukrainian hryvnia), and product codes of each export and import transaction, as well as the tax IDs of the Ukrainian trading firms. Both export and import data are from January 2013 through December 2016. Unfortunately, the information on exports is missing for five months, from February through June 2014. However, our findings are robust to excluding these five months from the analysis and to imputing export data in various ways, including using Russian customs data (Russia 2014)—online Appendix G explores this issue in detail. Moreover, our baseline results hold for export and import transactions separately (see online Appendix Table A3). In total, the trade dataset contains 21.6 million transactions, 2.2 million of which are with Russia. For most of our results, we focus on trade with Russia and collapse the data at the firm-month level.

Crucially, our trade dataset contains the addresses of the Ukrainian trading firms. This feature, rarely available in customs data, allows us to merge trade transactions with various characteristics of the firm's home district, including its ethnolinguistic composition. Data on the ethnolinguistic composition of the districts come from the latest Ukrainian census, conducted in 2001 (State Statistics Committee of Ukraine

[20] The stand-alone coefficients on Rus_d and $Post_t$ are absorbed by the firm and year-month fixed effects, respectively.

[21] See online Appendix F for all main tables replicated with the Conley spatial heteroskedasticity- and autocorrelation-consistent standard errors.

2001). From this census, we obtain district-level data on the share of ethnic Russians and the share of local population who consider Russian their mother tongue. Firm addresses also allow us to compute precise distances to the closest Russia-Ukraine border checkpoint—for details regarding these calculations, see online Appendix B.

Using tax IDs of Ukrainian firms, another feature infrequently available in analogous datasets, we merge trade transactions with the Orbis/Amadeus database (Bureau van Dijk 2011–2016). Available for 2011 to 2016, this dataset contains the accounting information, including total sales, profits, inputs, and number of employees. It also includes names of the firms' managers, which we merge and use to calculate a proxy for the prevailing ethnicity of the firms' key decision-makers. We introduce our name-classification methods in Section IVB. In total, the Orbis/Amadeus dataset contains information on more than 460,000 Ukrainian firms, i.e., the near universe of firms that are obliged to hand their accounting information over to the Ukrainian government based on their organizational form.[22]

Based on the ten-digit Harmonized Systems (HS) product code available for every trade transaction, we categorize each transaction based on the type of product traded. For instance, using the correspondence tables between the HS and Broad Economic Categories (BEC) codes, we classify each entry as an intermediate-good or a consumer-good transaction.[23] Similarly, using the methodology in Rauch (1999b), we categorize each transaction as involving differentiated or homogeneous products.[24] Further, to study heterogeneous effects by contract types (OA and CIA), we merge data from Demir, Michalski, and Ors (2017) and Demir and Javorcik (2018b) on the frequency of different trade contracts used in trade between Russia, Ukraine, and Turkey from 2004 to 2011 at the four-digit HS level.

The data examined earlier in Section ID are a series of nationally representative surveys of Ukrainian citizens conducted by the Kyiv International Institute of Sociology (KIIS). These track the opinions of the Ukrainian people on societal and political issues four to five times per year using a repeated cross-sectional sampling design. We use 15 survey waves conducted on a nearly quarterly basis from January 2013 to December 2016 (Kyiv International Institute of Sociology 2013–2016). For each wave, the sample of the KIIS survey includes around 2,000 respondents in 110 localities across all 25 Ukrainian provinces. The data include information on the respondent's self-reported ethnic identity and home province, which we use to track the changes in attitudes across ethnicity and provinces of different ethnic composition.

[22] As suggested in Kalemli-Ozcan et al. (2015), Ukrainian filing requirements are one of the most demanding in the world.

[23] We use the official conversion table between HS 2012 and BEC 4 product codes (UN Trade Statistics 2017). We then use the official COMTRADE classification of BEC codes into capital, intermediate, and consumption goods (UN Trade Statistics, 2016). For simplicity, we combine intermediate and capital goods into a single category under the name "intermediate goods."

[24] First, we use the official conversion table between the HS 2012 and Standard International Trade Classification (SITC 2) product codes available at UN Trade Statistics (2017). We then use data from Rauch (1999a), to categorize SITC 2 product codes into differentiated, reference-priced, or homogeneous goods. For the rest of the paper, we combine reference-priced products and the goods traded on an organized exchange into a single category we call "homogeneous goods." We use the more conservative classification from Rauch (1999b) in our analysis, although our results are robust to using a less conservative ("liberal") classification.

C. *Descriptive Statistics*

Before turning to our main analysis, we present in online Appendix Table A1 the summary statistics of the data we use in this study. We analyze trade transactions of 12,601 Ukrainian firms located in 392 Ukrainian districts over the 48-month period, from January 2013 to December 2016. We show in panel A that an average firm in our sample traded with Russia every fifth month and, overall, engaged in roughly three trade transactions per month. As for the quantity of trade, an average firm traded 235 tons and UAH 1.3 million worth of product per month.[25] Notably, the distributions of the total net weight and the total value traded have long right tails, which motivates the use of logarithm transformations in our analysis. Per panel B, an average firm traded intermediate goods in 76.8 percent of its transactions, stressing the prevalence of business-to-business sector transactions in our dataset. Similarly, only 22.3 percent of average firms' transactions involved homogeneous goods.

Panel C of online Appendix Table A1 suggests that Ukrainian firms that trade with Russia are located in highly ethnically and linguistically diverse areas. An average firm trading with Russia is based in a district with 15 percent ethnic Russians and 26 percent native Russian speakers. However, even after excluding the conflict areas, which historically have had a sizable Russian presence, some firms in our sample are located in districts with 53 percent ethnic Russians or 75 percent native Russian speakers. In contrast, some firms in our sample are based in areas with less than 1 percent ethnic Russians or native Russian speakers. Panel D shows that, depending on the classification method, 30 percent to 34 percent of the managers in an average Ukrainian firm trading with Russia have a traditionally Russian last name. Notably, these numbers are in line with the summary statistics of the ethnolinguistic composition of the firm's districts in panel C, which validates our classification methods.[26]

According to panel E of online Appendix Table A1, an average Ukrainian firm trading with Russia is located about 300 kilometers away from the Russia-Ukraine border by road and 500 kilometers away by railroad. The closure of parts of the border due to the conflict somewhat increased the average distance, but the magnitude of that increase is rather small. Finally, panel F of online Appendix Table A1 presents accounting data for all Ukrainian firms in the Orbis/Amadeus database (Bureau van Dijk 2011–2016).[27]

D. *Descriptive Time-Series Analysis*

To complement the static description of the data in online Appendix Table A1, this section examines the overall decline in trade between Ukrainian and Russian firms after the start of the conflict.

First, we document a large decline in firms' monthly trade activity. Figure A5 in the online Appendix traces the change in the monthly number of Ukrainian firms

[25] The equivalence of 235 tons is 11–12 fully loaded trucks. As of August 2014, UAH 1.3 million was equivalent to $108,000 worth of product.

[26] For details on the classification methods, see Section IVB.

[27] Accounting data are available for 10,791 of the 12,601 firms in our main sample. Selection is due to individual entrepreneurs not being required to report the data to the government. See Kalemli-Ozcan et al. (2015) for details on Orbis/Amadeus filing requirements by country.

trading with Russia. As one can see, before the start of the conflict, the number of firms trading with Russia was relatively stable, at around 3,500 per month. However, after the start of the conflict, this number substantially declined, remaining at about 2,500 firms per month.[28]

Second, we show that firms decreased not only their monthly trade frequency but also their monthly volume of trade. To document this fact, we compare firms' trade intensity before and after the conflict started in a simple time-series specification.[29] Columns 1 to 3 of Table 1 display the results for a firm's total trade intensity with Russia. Column 1 shows that, with the start of the conflict, the probability of monthly trade with Russia by an average firm declined by 8.1 percentage points, or 0.2 standard deviations. Columns 2 and 3 suggest that an average Ukrainian firm experienced a substantial decline in monthly trade volume with Russia. The estimates correspond to a dramatic 56.3 to 64.5 percent decline in firm-level trade volume with the start of the conflict (interpreting the coefficients following Halvorsen and Palmquist 1980). Finally, both exports to and imports from Russia suffered as a result of the conflict, although the exports fell by a somewhat larger margin. According to columns 4 and 7 of Table 1, the average monthly frequency of trade fell by 9.6 percentage points for exporters and by 5.9 percentage points for importers.[30] This is despite a similar preconflict base of 26.1 and 22.9 percentage points, respectively. A similar pattern is observed for the drop in weight and value of the traded products.[31]

Figure 4 previews our main results by tracking trade before and after the start of the conflict by firms in districts above and below the median in terms of the share of ethnic Russians.[32] In 2013, i.e., before the conflict, the two groups of firms behaved very similarly. However, after the start of the conflict, firms from districts with fewer Russians decreased their trade by a larger margin relative to firms from more Russian areas of Ukraine. Moreover, the gap between the two subsets of firms

[28] Note that the number of firms trading with Russia in January is consistently lower than in other months. January is a short business month in Russia because of the New Year and Christmas holidays. However, after explicitly controlling for the monthly indicators in a regression form, we still estimate the effect of conflict on the number of firms as a loss of 1,000 firms trading with Russia per month.

[29] Specifically, we estimate

$$Y_{it} = \alpha_i + \delta_m + \gamma \times Post_t + \epsilon_{it}, \tag{2}$$

where the outcome variable Y_{it} is the trade activity of firm i at year-month t, $Post_t$ is an indicator for whether a given time period falls before or after the start of the conflict, α_i and δ_m present the firm and month fixed effects, respectively, and ϵ_{it} are the unobserved firm-time-specific shocks. Under the assumptions that the conflict was unexpected, there were no simultaneous shocks of similar magnitude, and the fixed-effects model describes the data-generating process correctly, regression (2) provides consistent estimates for the overall effect of conflict on trade in noncombat areas.

[30] The number of districts differs across columns, as some exporters are located in districts with no importers and, vice versa, some importers are located in districts with no exporters.

[31] We hypothesize that the exports could have declined more due to the unilateral elimination of import tariffs by the European Union with respect to Ukrainian products in April 2014. However, in Section IIIB, we argue why this institutional change cannot explain the differential decline in trade by ethnicity.

[32] To construct this graph, we first regress the log of total weight traded with Russia by a firm in a given month on the firm fixed effects. We then calculate the median residuals for two subsets of firms, depending on whether they are located in a district with more or fewer ethnic Russians. Subsequently, we residualize out the month fixed effects.

Table 1—Reduction in Trade after the Start of the Conflict

	All trade			Export transactions			Import transactions		
Dependent variable:	Any trade activity	Log total weight traded	Log total value traded	Any export activity	Log total weight exported	Log total value exported	Any import activity	Log total weight imported	Log total value imported
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Post-February 2014	−0.081	−0.826	−1.036	−0.096	−0.980	−1.206	−0.059	−0.573	−0.741
	(0.003)	(0.039)	(0.040)	(0.007)	(0.083)	(0.087)	(0.005)	(0.048)	(0.071)
Firms fixed effects	✓	✓	✓	✓	✓	✓	✓	✓	✓
Month fixed effects	✓	✓	✓	✓	✓	✓	✓	✓	✓
Dependent variable mean	0.205	2.012	2.783	0.200	1.942	2.714	0.191	1.878	2.590
Dependent variable st. dev.	0.404	4.175	5.549	0.400	4.073	5.480	0.393	4.077	5.397
R^2	0.41	0.49	0.46	0.41	0.48	0.46	0.41	0.49	0.45
Observations	579,445	579,445	579,445	297,603	297,603	297,603	363,456	363,456	363,456
Firms	12,601	12,601	12,601	6,921	6,921	6,921	7,572	7,572	7,572
Districts	392	392	392	341	341	341	313	313	313

Notes: This table presents the time-series estimates of the average decline in trade between Ukrainian firms and Russia after the start of the conflict. Columns 1 through 3 focus on the sum of export and import transactions, columns 4 through 6 only on export transactions, and columns 7 through 9 only on import transactions. Columns 1, 4, and 7 use an indicator for a firm trading with, exporting to, or importing from Russia in a given month. The logarithms of total value and net weight of shipped goods are calculated by transforming the initial variable X with $L(X) = \log(X + 1)$. Standard errors in parentheses are clustered at the district level.

is always of the same sign and increasing over time. For an analogous figure based on raw data without residualization, see Figure A6 in the online Appendix.[33]

Overall, the time-series results in Section IID suggest that since the start of the conflict, (i) an average Ukrainian firm substantially decreased both the frequency and the volume of trade with Russia, (ii) both exports to and imports from Russia have suffered, and (iii) a simple split of trade patterns along districts' ethnicity already reveals that conflict had a differential impact on firms along ethnic lines. In the next section, we introduce our formal difference-in-differences estimates, which examine this divergent reaction in greater detail.

III. Results

A. *Main Results*

We start by estimating our baseline difference-in-differences equation (1), which seeks to establish whether trade between Russian and Ukrainian firms broke down along ethnic and cultural lines after the start of the 2014 Russia-Ukraine conflict. Table 2 presents the baseline estimates. Similar to Table 1, we estimate the effect using three outcome variables: (i) an indicator for any trade activity (export or

[33] One may worry that the preconflict differences in trade volume across more and less Russian areas in online Appendix Figure A6 are due to some omitted firm-level characteristics that themselves cause a heterogeneous decline in trade after the conflict. To assuage this concern, we present an alternative raw-data figure constructed for a sample of firms matched on their preconflict characteristics, such as size and industry. The resulting Figure A7 in the online Appendix produces patterns that are similar to Figure 4. For details on the matching procedure, see notes to online Appendix Figure A7. For additional evidence that further addresses the concern of preexisting differences in firm characteristics, see online Appendix C.

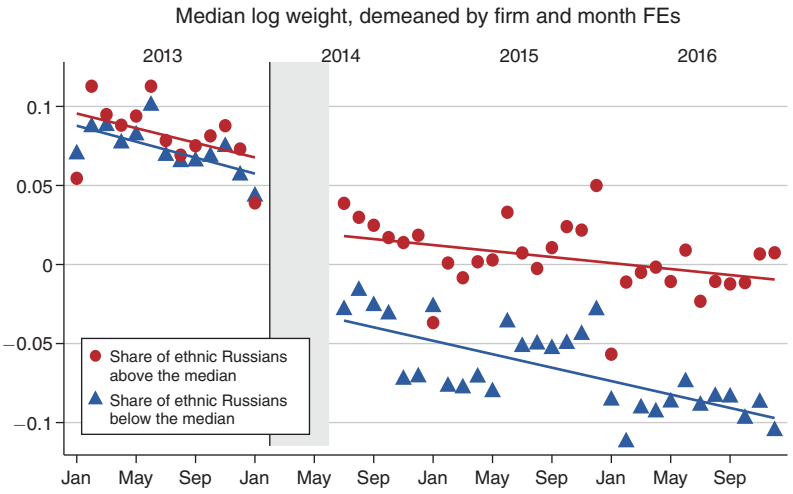

FIGURE 4. FIRM-LEVEL TRADE WITH RUSSIA, BY ETHNIC COMPOSITION OF FIRMS' DISTRICTS

Notes: The data plotted are the monthly median residuals from a firm-level regression of the logarithm of the total weight traded (export + import) on firm fixed effects. Data are then broken down by the share of Russian population in firms' districts and are cleaned of seasonality with month fixed effects and an interaction between the January indicator and the share of ethnic Russians to account for January as a seasonal outlier. (January is a short business month in Russia, with a full holiday week from January 1 to 7.) Export data are missing for February to June 2014 (colored in gray). These months are removed for the purpose of this graph. All calculations exclude firms located in the areas affected by the conflict (see Figure 2). Lines represent the linear fit to the scatterplots with the corresponding color separately before and after the start of the conflict.

import) with Russia by a firm in a given month, (ii) a logarithm of the total net weight traded by a firm in a given month, and (iii) a logarithm of the total value traded by a firm in a given month.

Columns 1 to 3 of Table 2 display the results for the share of ethnic Russians as a measure of cultural distance from Russia. The interaction coefficient β is positive and significant at the 1 percent level across all three specifications. The estimates suggest that moving a firm from a Ukrainian district at the seventy-fifth percentile of ethnic Russians (17.7 percent) to a district at the twenty-fifth percentile of ethnic Russians (9.7 percent) would have decreased the monthly incidence of trade by 0.8 percentage points and a firm's volume of trade by 9.9 to 11.2 percent. When compared to the results in Table 1, such a move would have deepened the decline in a firm's monthly incidence of trade by about 9.9 percent for the incidence of trade and by 10.8 to 12.1 percent for trade volume. Moreover, these estimates suggest that a hypothetical firm located in an all-Russian district would not have decreased its trade with Russia at all, with a caveat that this is an out-of-sample prediction.

We observe similar patterns with a different proxy for cultural distance from Russia—the share of residents who consider Russian their mother tongue across Ukrainian districts. For simplicity, throughout the paper, we call this measure the "share of Russian speakers." Columns 4 through 6 of Table 2 present the estimates. The results are strikingly similar to columns 1 through 3, in terms of both statistical significance and magnitude. As before, all else held equal, moving an average firm from a district at the seventy-fifth percentile of native Russian speakers (25.8 percent) to a district at the twenty-fifth percentile (12.6 percent) would have led to a

TABLE 2—BASELINE RESULTS

Dependent variable:	Any trade activity (1)	Log total weight traded (2)	Log total value traded (3)	Any trade activity (4)	Log total weight traded (5)	Log total value traded (6)
Post-February 2014	0.100	1.249	1.398			
× share of ethnic Russians	(0.030)	(0.364)	(0.403)			
Post-February 2014				0.047	0.609	0.660
× share of Russian speakers				(0.014)	(0.170)	(0.189)
Firm fixed effects	✓	✓	✓	✓	✓	✓
Year-month fixed effects	✓	✓	✓	✓	✓	✓
Dependent variable mean	0.205	2.012	2.783	0.205	2.012	2.783
Dependent variable st. dev.	0.404	4.175	5.549	0.404	4.175	5.549
R^2	0.41	0.49	0.46	0.41	0.49	0.46
Observations	579,445	579,445	579,445	579,445	579,445	579,445
Firms	12,601	12,601	12,601	12,601	12,601	12,601
Districts	392	392	392	392	392	392

Notes: This table presents the baseline difference-in-differences estimates of the impact of the Russia-Ukraine conflict on trade between Russia and Ukrainian firms in areas with different presence of ethnic Russians and native Russian speakers. Columns 1 and 4 use an indicator for a firm trading with Russia in a given month (export + import). The logarithms of total value and net weight of shipped goods (export + import) are calculated by transforming the initial variable X with $L(X) = \log(X + 1)$. Data on ethnolinguistic composition are at the district level and come from the 2001 Ukrainian census. The share of native Russian speakers is the percentage of people who named Russian as their mother tongue (*rodnoi yazik*). Standard errors in parentheses are clustered at the district level.

0.62 percentage point drop in a firm's monthly incidence of trade and an 8.0 to 8.7 percent decline in a firm's trade volume.

To allow for the visual exploration of our results, we present our estimates in a month-by-month form. That is, instead of the interaction with the post-February 2014 indicator, we interact the districts' ethnic composition with a full set of year-month dummy variables. For illustration purposes, this specification uses the share of ethnic non-Russians in the interaction term.[34] Figure 5 displays the results. First, we find no evidence of pretrends, as the share of ethnic non-Russians in the firm's district does not differentially matter for its trade with Russia before the conflict, relative to the excluded month of January 2014. Thus, we find support for the central assumption of our difference-in-differences strategy, i.e., parallel trends. Second, the differential impact of conflict on trade between Russian and Ukrainian firms stayed negative and significant until the end of our time series, in December 2016, i.e., almost three years after the start of the conflict. This lasting effect is consistent with the fact that the conflict was still ongoing. Finally, we note that the timing of the spike in the interaction term in December 2014–February

[34] That is, we estimate the following equation:

$$Y_{idt} = \alpha_i + \gamma_t + \sum_t \beta_t \times NonRus_d + \epsilon_{idt}, \tag{3}$$

where Y_{idt} is trade intensity of firm i at district d with Russia (export + import) at year-month t, α_i and γ_t are the firm and year-month fixed effects, respectively, and $NonRus_d$ is the share of ethnic non-Russians in the district d of firm i where $NonRus_d = 1 - Rus_d$.

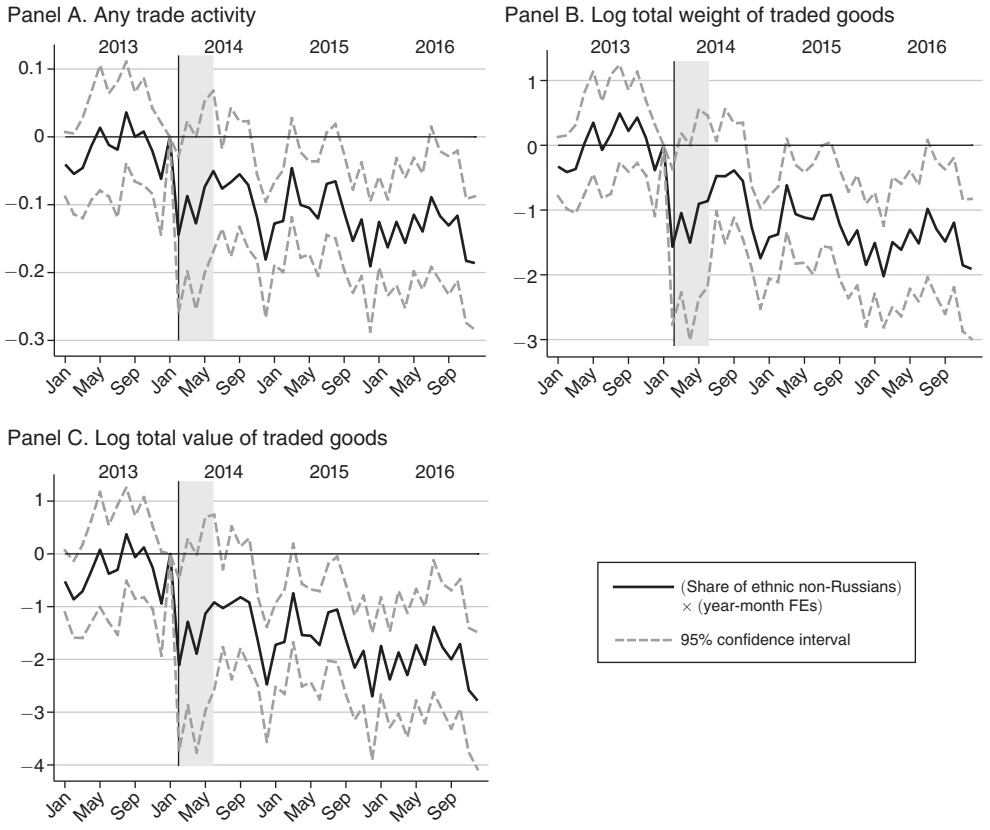

FIGURE 5. DYNAMICS OF THE IMPORTANCE OF LOCAL ETHNIC COMPOSITION FOR FIRMS' TRADE WITH RUSSIA

Notes: This graph displays the results of estimating equation (3), which modifies the baseline equation (1) by interacting year-month fixed effects (FEs) with the ethnic composition of the firms' districts. For February through June 2014, only import data are present (colored in gray). Online Appendix G establishes robustness to removing these five months from our analysis or recovering missing data from the Russian customs data. Panel A displays the results for any trade activity with Russia in a given month (export + import) as the dependent variable, panel B displays the results for the logarithm of total weight of the goods traded with Russia (export + import), and panel C displays the results for the logarithm of total value traded (export + import). Share of ethnic non-Russians is calculated as 1 − share of ethnic Russians. Ninety-five percent confidence intervals are constructed for standard errors clustered at the district level.

2015 coincides with the spike in violence and negative attitudes toward Russia in Figure 3, consistent with our preferred interpretation.

Overall, the baseline difference-in-differences estimates point to a sizable and highly statistically significant differential decline in trade across Ukrainian districts—firms from areas with fewer preexisting ethnic and cultural ties with Russia decreased trade with Russia by a larger margin. More broadly, these results provide the first evidence that armed conflict has a substantial indirect effect on intergroup trade, even in non-combat areas. In the next section, we provide evidence that these results survive multiple rigorous robustness checks and are not due to various mechanical explanations unrelated to ethnicity or anti-Russian sentiments. After that, we establish whether our main results are due to a decline in trust or local pressure from consumers and activists, and we explore the role of individual ethnicity of firm managers and owners.

B. *Alternative Explanations and Robustness Checks*

In this section, we rule out the main alternative explanations for our baseline findings, including differences in distance to the Russian border, confounding product-specific shocks, and contemporaneous local economic shocks. We then discuss several other hypotheses and test the overall robustness of our estimates.

Geographical Distance to Russia.—The first concern we address is that the baseline results may be driven by the geographical distance to Russia, rather than by preexisting ethnic and cultural heterogeneity per se. Figure 1 shows that areas with the fewest ethnic Russians are, on average, located far from the Russia-Ukraine border. Therefore, a distance-related shock due to the conflict—for instance, if it substantially raised transportation costs—could mechanically have a bigger impact on firms in the areas of Ukraine with fewer ethnic Russians.

To rule out this explanation, we calculate a firm's distance to Russia and include its various forms as covariates. Specifically, we compute the two shortest paths from the firm's precise coordinates to the closest Russia-Ukraine checkpoint: one via roads and one via railroads. We account for the change in the border after the start of the conflict by recalculating the shortest path without taking into account checkpoints in the Luhansk and Donetsk provinces closed due to the conflict.[35]

Table B1 in online Appendix B presents the results. The table controls for distance linearly and flexibly (via a fifth-order polynomial), and interacts these measures with the postconflict indicator. The interactions allow for the conflict-induced shocks that correlate with distance, such as increased transportation costs. Columns 1 through 4 focus on the road-based measure of distance, while columns 5 through 8 focus on the railroad-based measure. Across all specifications, the interactions between the post-February 2014 indicator and the share of ethnic Russians remain positive, highly statistically significant, and of similar magnitudes to Table 2. Furthermore, Online Appendix B contains alternative versions of all the tables from the main text, controlling for the interaction between the postconflict indicator and road distance to the closest checkpoint.[36] The results remain very similar. Overall, these estimates indicate that it is highly unlikely that the presence of ethnic Russians matters for our baseline results only as a proxy for distance to Russia.[37]

Confounding Product- and Industry-Specific Shocks.—Another important alternative explanation concerns product- and industry-specific shocks that may arise due to the Russia-Ukraine conflict. Note that all shocks that applied uniformly to all products would be absorbed by time fixed effects. However, one example for why industry differences may matter in this context is that, immediately after the start of the conflict, all military cooperation between the two countries ceased, which

[35] For details on these calculations and the identification of checkpoints and firm coordinates, see online Appendix B.

[36] We use road distance for brevity purposes only. The results are robust to using railway distance instead.

[37] Online Appendix Table B2 presents the results of a related robustness check that controls for first- and second-degree polynomials of the firm's latitude and longitude. This check further ensures that our results are not driven by spatial correlations in the treatment. Despite the demanding nature of this exercise, our estimates remain positive and statistically significant.

naturally affected trade in the related sectors.[38] Thus, hypothetically, if areas with fewer preexisting ties with Russia were more involved in the production of products in military-related sectors, this may have biased our baseline difference-in-differences estimates upward, without ethnicity playing any role.[39]

To address this issue, first, we estimate a difference-in-differences specification at the product-firm-month level with product-post fixed effects.[40] Similar to equation (1), this specification compares firm-product pairs' reactions to the start of the conflict depending on the ethnic composition of the firm's district. In addition, it accounts for the product-specific shocks contemporaneous with the start of the conflict. Identification still relies on the parallel-trends assumption. That is, we assume that firm-product trade would have evolved along similar trends in districts with different ethnic composition absent the conflict. If this assumption holds, the interaction coefficient estimates a causal impact of conflict on intergroup trade net of product-specific effects.[41]

Online Appendix Table A4 presents the results. The main coefficient stays positive and statistically significant, with magnitudes decreasing but remaining relatively large (16 to 18 percent of a standard deviation compared to 25 to 30 percent of a standard deviation in Table 2). Hence, our baseline results cannot be explained by the product-specific shocks that appear contemporaneously with the start of the conflict.[42]

We also estimate a version of our baseline specification controlling for the industry-post fixed effects. Online Appendix Table A5 displays the results: the baseline estimates remain virtually unchanged. This further confirms that industry differences cannot fully explain our estimates.

Confounding Local Economic Shocks.—Another set of potential explanations relates to district-level economic shocks arising simultaneously with the start of the

[38] Trade of arms, weapons, and other military products is classified information and, as such, is not present in our data. However, our data could still theoretically contain military-related procurement (e.g., airplane engines), trade of which may have stopped for political reasons.

[39] Other examples of product-specific shocks that may not be uniform across Ukrainian regions and may potentially confound our estimates are (i) bans of certain agricultural Ukrainian products by the Russian Federal Consumer Protection Agency, with rural areas of Ukraine being predominantly ethnically and culturally Ukrainian, and (ii) unilateral removal of all import tariffs for Ukrainian goods by the European Union in late April 2014 (albeit with some restrictions and quotas still in place), with the greatest tariff cuts for agricultural products.

[40] Specifically, we estimate the following equation:

$$Y_{ijdt} = \alpha_i + \gamma_t + \left[\delta_j + \kappa_j Post_t\right] + \beta \times Post_t \times Rus_d + \epsilon_{ijdt}, \tag{4}$$

where Y_{ijdt} is trade intensity of firm i from district d of product j with Russia (export + import) at year-month t; α_i, γ_t, δ_j, and κ_j are, respectively, the firm, year-month, product, and product-post fixed effects; Rus_d is the share of ethnic Russian in the district d of firm i; and $Post_t$ is the post-February 2014 indicator.

[41] To test whether the parallel-trends assumption holds, at least in the preconflict period, we estimate the month-by-month version of equation (4) interacting the share of ethnic Russians in a firm's district with a full set of year-month indicators, again using the share of ethnic non-Russians for illustration purposes. Online Appendix Figure A8 depicts the estimates: the coefficients for periods before the start of the conflict are not statistically significant and are close to zero in magnitude. This result lends support for the parallel-trends assumption that underlies specification (4).

[42] See online Appendix Figure A9 for firm-product-level coefficients estimated by product type, i.e., on subsamples of transactions that involve certain product codes. Note that neither military-related production, such as metals and machinery, nor agricultural products are the main drivers of the differential effect across ethnicity. Instead, the coefficients are positive and close to the baseline coefficient (horizontal dashed line) across all types of products.

conflict and that are correlated with the districts' ethnic composition. For instance, areas close to the armed conflict may have hosted more refugees, which could have generated positive demand and labor-supply shocks. Similarly, areas with fewer ties to Russia may have produced more activists and soldiers, possibly leading to an adverse labor-supply shock. Finally, political turnover after the Ukrainian revolution may have led to productivity shocks depending on the local electoral support for the new leader (Earle and Gehlbach 2015).

If negative district-specific shocks drive our results, then we should observe that areas with lower shares of ethnic Russians decreased their trade with all countries, not only Russia. We test this intuitive prediction in a triple-difference multicountry specification with district-post fixed effects.[43] In this strategy, outcomes are changing across space, time, and foreign country. The coefficient of interest on the triple interaction measures how much trade intensity with Russia changes with the start of the conflict for firms in districts with higher versus lower share of ethnic Russians, relative to such differential change in trade with other countries. With the help of cross-country variation, this strategy allows us to account for any contemporaneous district-specific economic shocks.

Table A6 in the online Appendix presents the results for the ten top trading partners of Ukraine, with all other countries counted as the eleventh "country." First, consistent with the literature on ethnic networks and trade (Rauch and Trindade 2002), we document that trade with Russia is positively correlated with the share of ethnic Russians relative to trade with other countries. However, the triple-difference coefficient is positive and significant, which means that, with the start of the conflict, firms in districts with fewer ethnic Russians decreased trade with Russia by a *disproportionately* larger margin relative to the change in their trade with other countries, and relative to their counterparts in other parts of Ukraine. That is, when a hypothetical firm is moved from an area with 17.7 percent (seventy-fifth percentile) ethnic Russians to an area with 9.7 percent (twenty-fifth percentile), its chance of having any monthly trade activity with Russia after the start of the conflict, as opposed to with other countries, drops by about 1 percentage point. This magnitude is similar to our baseline results.[44]

Online Appendix Table A7 presents the estimates of a similar multicountry specification (5), but with the shares of partner countries' ethnicities instead. The set of comparison countries consists of five nations with the biggest ethnic minorities in Ukraine: Russia (17.2 percent of Ukrainians as of 2001), Belarus (0.6 percent), Moldova (0.5 percent), Bulgaria (0.4 percent), and Hungary (0.3 percent). The

[43] Specifically, we estimate the following equation:

$$(5) \qquad Y_{idct} = \alpha_i + \gamma_t + \left[\mu + \beta Post_t\right] \times Rus_d \times Russia_c + \left[\delta_c + \kappa_c Post_t\right] + \nu_d Post_t + \epsilon_{idct}.$$

Here, Y_{idct} is trade intensity (export + import) of firm i of district d with country c at time t, $Post_t$ is an indicator for whether time period t is after the start of the conflict, $Russia_c$ is an indicator for whether the trading country c is Russia or not, and Rus_d is the share of ethnic Russians in district d of firm i. Furthermore, α_i, γ_t, and δ_c are firm, time, and country fixed effects; κ_c and ν_d are country-post and district-post fixed effects, respectively.

[44] Online Appendix Figure A10 displays the month-by-month coefficients across top-ten trading partners. With the start of the conflict, the coefficients for Russia turn from being in the middle of the pack to being consistently bigger relative to the coefficients for the other countries. These figures further confirm that ethnic heterogeneity mattered in a unique way for trade with Russia as opposed to other countries.

estimates again show that the interaction between the local shares of a partner country's ethnicity and the postconflict indicator is much larger for Russia than for other countries, even conditional on the district-post fixed effects.[45]

Overall, the estimates presented above strongly back our assertion that our baseline results are not driven by negative locality-specific shocks.

Economic Desperation.—Another alternative interpretation of our results is firms' economic desperation. Specifically, it could be that firms in more Russian areas faced more severe economic constraints due to their proximity to conflict[46] and, as a result, were forced to continue trading with Russia.

We argue that this effect is unlikely to drive our estimates. First, in a multicountry-trade specification in Section IIIB, we have already shown that our results are robust to the inclusion of the district-post fixed effects. That is, if local economic conditions were crucial for our baseline results, we would observe similar declines in trade with other countries, which is ruled out by the results in online Appendix Table A6. Second, online Appendix Table A10 shows that our main estimates survive conditioning on a firm's yearly sales at the firm-year level—if anything, the interaction coefficient on the share of ethnic Russians goes up relative to the specification with no controls. Third, online Appendix Table A11 reports our baseline estimates controlling for the interaction between the postconflict indicator and the 2013–2014 decline in a firm's sales, employment, and total assets. Again, the results do not change. We conclude that the economic-desperation hypothesis cannot explain our results.[47]

Expectations of Future Russian Invasion or Interference.—Another alternative explanation has to do with the role of expectations regarding future Russian action. Donbas and Crimea are both regions with a high presence of ethnic Russians. Thus, since February 2014, firms in other areas with a higher share of ethnic Russians may also consider future Russian interference in their region as more likely. This could potentially increase the value of those firms' connections with Russia and, thus, explain their smaller decline in trade with Russian firms.

First, we argue that this expectation effect, while plausible at the beginning of the period (early to mid-2014), is much less likely to matter in 2015 and 2016. By then, the conflict turned "frozen" and the likelihood of Russian interference in other

[45] Relatedly, Table A8 in the online Appendix displays the placebo estimates for our baseline results using districts' shares of other ethnicities (non-Russians and non-Ukrainians) as a measure of local ethnic composition. The estimates are null and far in magnitude from the estimates in Table 2.

[46] Analyzing the census of Ukrainian firms from the Orbis/Amadeus database (Bureau van Dijk, 2011–2016), online Appendix Table A9 indeed shows that firms in areas with a higher Russian presence experienced a deeper overall economic decline in the immediate aftermath of the conflict. Column 4 of online Appendix Table A2 also shows lower satisfaction with the economic situation in those areas. It is beyond the scope of this paper to rationalize this pattern, but we speculate that it may be due to the disruption of input-output linkages with the areas of armed conflict (Carvalho et al. 2021). We study this phenomenon in the context of the 2014 Russia-Ukraine conflict in a companion paper (Korovkin and Makarin 2022).

[47] A related alternative explanation has to do with the intergroup tensions within Ukraine: firms in areas with a larger ethnic Russian population may experience a decline in their trade with the rest of the country, and this may further lock them into trading with Russia. The results in this section speak against this hypothesis, as the group-specific decline in trade with Russia is still present controlling for changes in firms' aggregate sales. Nevertheless, even if this alternative explanation held, since it would still involve a breakdown of intergroup trade in nonconflict areas, this would be one of the mechanisms behind our findings.

Ukrainian territories decreased substantially. Contrary to this logic, our effects continue to hold until December 2016. Further, if firms seriously expected an escalation similar to what happened in the DPR and LPR, they would likely have left altogether, which we do not observe in our data. As documented in online Appendix B, less than 1 percent of the firms in our data changed their address, and excluding them does not affect our results (online Appendix Table B7). Finally, we gauge this channel by studying two additional survey outcomes: satisfaction with the national security of Ukraine and the perceived degree of uncertainty. Columns 5 and 6 of Table A2 in the online Appendix report the results. The post × share of ethnic Russians interaction coefficients are of the expected sign but are not statistically significant. Their magnitudes, while not trivial (0.09–0.1 standard deviations), are two times smaller than for other questions in columns 1 through 4 of online Appendix Table A2. Hence, these concerns do not appear to be as *differentially* salient as, for instance, anti-Russian attitudes or the economic situation.

Overall, we argue that concerns of future Russian military action, while an important consideration, are unlikely to be driving the results of this paper.

Additional Alternative Explanations and Robustness Checks.—In addition to the concerns addressed above, we are able to rule out five other explanations. First, in contrast to Berger et al. (2013), we document that our baseline results are not due to the relocation of government contracts by Ukrainian state-owned firms.[48] Second, our estimates are not due to an increase in tariffs between Russia and Ukraine in 2016, since we can exclude 2016 altogether without any qualitative change in our results.[49] Third, we can show that our baseline results are not driven by any one specific area, thus ruling out the possibility that the effect is driven by outlier regions.[50] Fourth, our results are not due to preconflict differences in firm characteristics across different areas of Ukraine, such firm size or revenue (see online Appendix C). Finally, it is unlikely that our effects are due to some other event happening before or after the start of the conflict, as our baseline difference-in-differences estimate is larger than 44 of the 45 placebo estimates obtained by creating fake starting months of the conflict.[51]

IV. Mechanisms

In this section, we seek to explain why conflict leads to a reduction in intergroup trade in noncombat areas. First, using variation in contract types, we argue that erosion of intergroup trust is the key mechanism behind our baseline estimates. Second, classifying the last names of firm managers and owners, we show that the ethnic composition of a locality matters only for firms not operated by individuals of Russian origin. This result is further consistent with the trust-based explanation.

[48] Online Appendix Table A12 shows that removing state-owned firms from the analysis does not change our results.

[49] See online Appendix Table A13 for these results.

[50] Online Appendix Table A14 shows that the baseline results hold without the capital of Ukraine (Kyiv), without the regions close to conflict areas, and without Western Ukraine. Moreover, online Appendix Figure A11 illustrates that the baseline coefficient remains stable when we remove Ukrainian provinces one by one from our sample.

[51] See online Appendix Figure A12. The only placebo estimate larger than the baseline assumes November 2016 as the start of the conflict and, thus, is estimated using only one month of data.

Next, we argue that a rise in local nationalism causes a disruption of intergroup trade through consumer action and reputational pressure on Ukrainian firms. Finally, we show that discrimination at the border does not drive our baseline estimates.

A. *Erosion of Intergroup Trust*

First, we explore whether our results are due to a decline in trust between Ukrainian firms and their Russian counterparts.[52] The existing theoretical literature suggests that conflict may cause a decline in confidence between trade partners from antagonistic groups, resulting in a breakdown of trade (Rohner, Thoenig, and Zilibotti 2013b). Evidence in online Appendix D suggests that there was a spike in trade disputes between Russian and Ukrainian firms after the start of the conflict, which likely made the issue of trust more salient. For these reasons, it is natural to hypothesize that our baseline results could be driven by the decline in intergroup trust.

To test for the general importance of trust in our results, we explore variation in trade contracts. As we mentioned in the introduction, the two most prevalent standard types of contracts in international trade are open account (OA) and cash-in-advance (CIA) contracts. In a CIA contract, the importer pays before the good is shipped. In contrast, an OA contract refers to a sale where the goods are shipped and delivered before payment is due. Thus, if the breakdown of trust is indeed driving our results, we would expect a greater effect for *exporters* that primarily used OA contracts before the start of the conflict, as these types of contracts placed a bigger risk on exporters. On the contrary, if Ukrainian *importers* were fearful of the contract not being honored, we would expect a bigger effect if they relied on CIA contracts.

The closest available microlevel data on the types of trade contracts are between Ukraine, Russia, and Turkey over the 2004–2011 period.[53] Due to privacy concerns, these data are available only as averages at the four-digit HS (HS4) product-code level. For each firm in our sample, we use information on the products they trade to calculate the predicted shares of transactions conducted in one of the three types of standard trade contracts: OA, CIA, and LC.[54] Using this predicted contract usage, we test the hypothesis of weakened trust and problems in contract enforcement.[55]

[52] In this section, we focus on a decline in intergroup trust that is tightly linked with the decline in partners' trustworthiness and the results in online Appendix D.

[53] These data, kindly shared with us by Banu Demir Pakel, were previously used in Demir, Michalski, and Ors (2017) and Demir and Javorcik (2018b). The data (Demir and Javorcik 2018a) contains shares of OA, CIA, and letters of credit (LC) contracts used for each four-digit product category. Note that the "mixed" type of contracts, e.g., in which parties pay half in advance and half on delivery, are virtually nonexistent in these data. OA and CIA constitute close to 90 percent of all contracts used.

[54] Specifically, for each firm, we calculate the average predicted contract usage weighted by the firm's amount of trade of each product (in kilograms). We conduct this procedure separately for exporters and importers. Our results are robust to variations of this procedure, including weighing contract usage by transaction value instead of by weight.

[55] We make several implicit assumptions in this analysis: (i) Russian and Ukrainian firms use similar contracts for similar products when they trade with each other as they do when they trade with Turkey, (ii) there have only been limited changes in the use of different types of contracts between the 2004–2011 and 2013–2016 periods, and (iii) the erosion of trust is asymmetric—ethnic Russians and Ukrainians within Ukraine vary in their trust in Russia or their trade counterparts, while Russian citizens do not differentiate between Ukrainians from different provinces. The latter assumption is indirectly confirmed by the lack of a differential change in attitudes toward Ukraine between Russian regions of different ethnic composition (see online Appendix E). Note that its violation

Table 3 presents the results of a heterogeneity analysis by a firm's predicted contract usage. To disentangle the risks levied on exporters and importers by different types of contracts, panel A and panel B display the results for export and import activity, respectively. Columns 1 and 2 of panel A show that the differential effect of conflict is more pronounced for exporters with a higher predicted use of OA contracts, which put the burden of potential nonpayment on exporters. In contrast, no differential effect of conflict exists among exporters with a higher predicted use of CIA contracts, in which the risk is placed on the importer. Notably, the picture is reversed for Ukrainian importers. Panel B of Table 3 suggests that the baseline effect was higher for importers with a higher predicted usage of CIA contracts and lower predicted usage of OA contracts—again, consistent with a decline in trust. The fact that the heterogeneity pattern is different for exporters and importers makes it highly unlikely that these results are due to omitted product characteristics.

Another implication of decreased trust is that, if given a chance, firms should reallocate their trade activity toward products that rely on less trust-intensive contracts. Table 4 tests this hypothesis at the firm-year level, with weighted predicted contract usage as an outcome variable. Importantly, the specification includes firm-level fixed effects, thus exploring within-firm variation over time. The results suggest that, indeed, exporters to Russia in less Russian areas of Ukraine relatively decreased the trade of products that rely on OA contracts. Instead, they relatively increased the trade of products that rely on CIA contracts. Similar to Table 3, the estimates are reversed for the importers from Russia. Note that these results are not a direct consequence of the results in Table 3, as the latter treat the product bundle of a given firm as fixed in time.[56]

Overall, these results strongly suggest that the breakdown of trust along ethnic lines played a significant role in explaining the reaction of Ukrainian firms to the Russia-Ukraine conflict.

B. *Individual-Level Animosity by Firms' Key Decision-Makers*

In our baseline specification, we established that conflict led to a differential decline in trade between Ukrainian firms and Russia depending on the share of ethnic Russians in a firm's district. However, it remains unclear whether a district's ethnic composition matters on its own or whether it serves as a proxy for individual ethnicity of firm managers and owners. This differentiation is not a mere curiosity; is also crucial for understanding the mechanisms. For instance, a possible channel is individual-level, taste-based discrimination between firms' key decision-makers: severe conflict could cause managers and owners of different backgrounds to discontinue their business ties voluntarily due to sharp political disagreements. We

would work against us finding any effects. This assumption does not limit the generalizability of our estimates, as a symmetric decline in intergroup trust would have likely led to an even larger decline in intergroup trade. As such, its violation only limits one's ability to detect the trust effect quantitatively.

[56] To explore whether the share of ethnic Russians predicts adoption of different types of contracts even before the conflict, online Appendix Table A15 presents these estimates without the firm-level fixed effects. Consistent with the general lack of Russian-Ukrainian ethnic tensions before the start of the conflict, coefficients on the share of ethnic Russians are not significantly different from zero and do not display a consistent pattern. For a detailed discussion of the determinants of the OA/CIA choice, both in the trade credit literature and in our data, see online Appendix H.

Table 3—Heterogeneity Analysis by Types of Trade Contracts

Subsample:	Difference p-value: 0.031		Difference p-value: 0.033	
	High predicted OA usage	Low predicted OA usage	High predicted CIA usage	Low predicted CIA usage
	(1)	(2)	(3)	(4)
Panel A. Exports (*any export activity as dependent variable*)				
Post-February 2014 × share of ethnic Russians	0.223	0.021	0.018	0.221
	(0.045)	(0.081)	(0.083)	(0.046)
Firm fixed effects	✓	✓	✓	✓
Year-month fixed effects	✓	✓	✓	✓
Dependent variable mean	0.213	0.186	0.186	0.212
Dependent variable st. dev.	0.409	0.389	0.389	0.409
R^2	0.44	0.38	0.39	0.43
Observations	172,731	117,820	113,649	176,902
Firms	4,017	2,740	2,643	4,114
Districts	277	271	270	275
Panel B. Imports (*any import activity as dependent variable*)				
	Difference p-value: 0.000		Difference p-value: 0.035	
Post-February 2014 × share of ethnic Russians	0.010	0.146	0.115	0.028
	(0.024)	(0.032)	(0.034)	(0.025)
Firm fixed effects	✓	✓	✓	✓
Year-month fixed effects	✓	✓	✓	✓
Dependent variable mean	0.193	0.192	0.189	0.194
Dependent variable st. dev.	0.394	0.394	0.392	0.395
R^2	0.40	0.42	0.42	0.40
Observations	222,960	134,832	123,120	234,672
Firms	4,645	2,809	2,565	4,889
Districts	262	221	212	267

Notes: This table explores the importance of trust by breaking down the baseline results along the direction of trade (exports to versus imports from Russia) and along the type of contract a firm is predicted to use. "OA" refers to an open account contract, in which a good is delivered before the payment is due. "CIA" refers to a cash-in-advance contract, in which an importer pays before the good is shipped. As such, OA contracts require exporters to trust importers more, while CIA contracts require importers to trust exporters. Predicted contract usage is calculated based on the types of products traded by a firm weighted by the amount of trade (in kilograms). We consider contract usage high (low) if the predicted share is above (below) the mean among the firms in the sample, separately for exporters and importers. For each HS4 product code, we use data from Demir, Michalski, and Ors (2017) and Demir and Javorcik (2018b) on average contract types used in trade between Ukraine, Russia, and Turkey from 2004 to 2011. The dependent variable in panel A (panel B) is an indicator of any exports to (imports from) Russia by a firm in a given month. Inference across regression models is conducted using a similarly unrelated regressions framework. Standard errors are clustered at the district level.

explore the role of individual ethnicity first by setting up a horse race between the local and the firm-level ethnic composition, and second by including an interaction between the two measures. We find little support for the animosity channel; however, the interaction specification reveals a pattern consistent with the trust-based explanation.

To study the ethnicity of key decision-makers, we bring in data from Orbis/Amadeus (Bureau van Dijk 2011–2016) and SPARK-Interfax (2011–2016) about firms' managers and owners, respectively, and we infer whether their surnames have Russian roots. Russian and Ukrainian surnames traditionally had different endings and, in general, had a different origin (Slavutych 1962; Unbegaun 1972). We use two classification methods to categorize last names into traditionally Russian and

Table 4—Decline in Trust and Reallocation of Trade

Subsample:	Exports		Imports	
Dependent variable:	High predicted OA usage	High predicted CIA usage	High predicted OA usage	High predicted CIA usage
	(1)	(2)	(3)	(4)
Post-February 2014 × share of ethnic non-Russians	−0.078	0.111	0.129	−0.176
	(0.037)	(0.039)	(0.047)	(0.049)
Year fixed effects	✓	✓	✓	✓
Firm fixed effects	✓	✓	✓	✓
Dependent variable mean	0.624	0.360	0.645	0.322
Dependent variable st. dev.	0.484	0.480	0.479	0.467
R^2	0.88	0.88	0.83	0.81
Observations	9,953	9,953	11,271	11,271
Firms	3,358	3,358	3,870	3,870
Districts	275	275	236	236

Notes: This table tests for the differential decline in trust by observing whether firms in less Russian areas of Ukraine decrease their relative trade of products that rely on more trust-intensive contracts. "OA" refers to an open account contract, in which a good is delivered before the payment is due. "CIA" refers to a cash-in-advance contract, in which an importer pays before the good is shipped. As such, OA contracts require exporters to trust importers more, while CIA contracts require importers to trust exporters. Predicted contract usage is calculated based on the types of products traded by a firm weighted by the amount of trade (in kilograms). We consider contract usage high (low) if the predicted share is above (below) the mean among the firms in the sample, separately for exporters and importers. For each HS4 product code, we use data from Demir, Michalski, and Ors (2017) and Demir and Javorcik (2018b) on average contract types used in trade between Ukraine, Russia, and Turkey from 2004 to 2011. Standard errors in parentheses are clustered at the district level.

others. In the first method, a last name is considered Russian if it contains traditional Russian endings, such as "ov," "ova," "ev," "eva," "in," or "ina."[57] In the second approach, we gauge the probability that a person's full name is Russian using Forebears (2021), the largest geospatial genealogical service.[58] Based on these two methods, we produce two measures of the share of key decision-makers with Russian roots, which we then use in a difference-in-differences equation (1) to discern whether personal identity can explain part of our results.[59] Since many more firms have data on managers than individual owners and since the results for the two groups of decision-makers are nearly identical, we focus on managers and present the estimates for owners in online Appendix I2.

First, we test for individual-level ethnic animosity by checking whether the ethnicity of a firm's key decision-makers drives our baseline results. Panel A of online Appendix Table I1 displays the difference-in-differences estimates in which we interact the postconflict indicator with the firm's share of Russian managers *instead of* the share of ethnic Russians in the firm's home district. We observe positive and, for the Forebears measure, statistically significant coefficients, although the results are weaker than for the share of ethnic Russians in the firm's district. Panel B of online Appendix Table I1 presents a horse-race exercise, where the "Russian-ness" of the managers is included together with that of the firm's district. The effect of the managers' Russian roots stays close to zero and is statistically insignificant, while

[57] See Zhuravlev (2005) for a detailed discussion of this approach.
[58] For further documentation, see https://forebears.io/about/name-distribution-and-demographics.
[59] For validation of these classification methods, see online Appendix I1.

the effect of the share of ethnic Russians in a district remains large and positive. These results suggest that conflict did not affect trade through individual-level animosity of key decision-makers inside the firm and instead operates through other mechanisms.[60]

Although individual-level animosity is unlikely to explain our results, ethnicity of firm managers and owners may still interact with local ethnic composition in a way that elucidates the underlying mechanisms. Table 5 presents the heterogeneity of baseline results by manager ethnicity. The estimates indicate that the differential decline in trade across district ethnicity is much more pronounced for firms with fewer managers of Russian origin. In turn, firms that mainly consist of managers with Russian roots did not differentially alter their trade with Russia. Such heterogeneity indicates that local share of ethnic Russians starts to play a role only when the key decision-makers within the firm do not themselves have strong markers of cultural and ethnic ties with Russia. This is consistent with the information- and trust-based explanation: shared ethnicity creates full trust but, in the absence of coethnicity, local ethnic composition helps mitigate the decline in trust too.[61]

C. *Local Activism*, *Consumer Boycotts*, *and Reputational Pressure*

One of the natural mechanisms via which local ethnic composition may affect trade during wartime is local activism and reputational pressure. Specifically, our results could arise from consumers in less Russian areas of Ukraine refusing to buy Russian brands and refusing to shop at Russian-owned stores. In addition, activists may create reputational pressure on firms that do business with the enemy, even if they do not deal with consumer products or merely export to Russia. As a result, firms may self-regulate, voluntarily decreasing their trade with Russia.

There is plenty of qualitative evidence for both phenomena in the context of the 2014 Russia-Ukraine conflict. A widespread consumer boycott campaign erupted with the start of the conflict. In many parts of Ukraine, supermarkets began to put a special label on Russian products that marked them as Russian, to make them easier for consumers to identify.[62] Activists held rallies at supermarkets to persuade their compatriots not to buy Russian goods. As Russian producers started to hide the origin of their products, activists developed a popular phone application that would detect them based on the barcode.[63] In March and April 2014, 52 percent of Ukrainian consumers viewed these boycott campaigns as favorable and 39 percent

[60] An instrumental variable specification confirms that these results are not due to measurement error. See online Appendix I3.

[61] For broader theoretical and empirical support of this point, see Guiso and Makarin (2020), who argue that, during crises and broad shocks to trustworthiness, trust declines deeper within low-affinity pairs of individuals (e.g., between partners of different ethnicity or partners from regions with different ethnic composition). Empirically, the authors find that individuals in low-affinity pairs not only tend to trust each other less but do so with a higher variance. Theoretically, a simple trust-game model rationalizing this pattern implies that, during negative shocks, individuals in low-affinity pairs shift their trust beliefs downward more and are more likely to acquire additional signals about their partners relative to high-affinity pairs. The authors provide support for these predictions using data from two distinct surveys. Another explanation, also in line with the trust channel, is that Ukrainians in more Russian areas interact with ethnic Russians more regularly and this familiarity helps alleviate the information frictions. This greater exposure may again explain the differential effect of local ethnic composition on top of individual ethnicity.

[62] korrespondent.net/ukraine/3442493-sdelano-v-rossyy-kak-mahazyny-markyruuit-tovary-yz-rf (in Russian).

[63] www.gazeta.ru/tech/2014/03/31_a_5971313 (in Russian).

Table 5—Heterogeneity of Baseline Results, by Firm Manager Ethnicity

Subsample:	Difference p-value: 0.000		Difference p-value: 0.000	
	Firms with 100% of Russian managers (endings)	Firms with 0% of Russian managers (endings)	Firms with Above 75th pct of Russian managers (Forebears)	Firms with Below 25th pct of Russian managers (Forebears)
	(1)	(2)	(3)	(4)
Post-February 2014 × share of ethnic Russians	0.016	0.202	−0.019	0.163
	(0.035)	(0.036)	(0.042)	(0.041)
Firm fixed effects	✓	✓	✓	✓
Year-month fixed effects	✓	✓	✓	✓
Dependent variable mean	0.207	0.223	0.210	0.225
Dependent variable st. dev.	0.405	0.416	0.407	0.418
R^2	0.40	0.42	0.41	0.42
Observations	142,321	345,254	124,419	124,437
Firms	3,084	7,491	2,700	2,701
Districts	202	355	190	257

Notes: This table explores the heterogeneity of the baseline results by whether firm managers are of Russian descent. In columns 1 and 2, managers' last names are treated as Russian if they end in "ov," "ova," "ev," "eva," "in," or "ina" (for a detailed discussion of this approach, see Zhuravlev (2005) (in Russian)). In columns 3 and 4, we use the probability that a randomly drawn firm's manager has a Russian last name as identified using Forebears, the largest geospatial genealogical service. The dependent variable in all columns is an indicator for a firm trading with Russia in a given month (export + import). Standard errors in parentheses are clustered at the district level.

stated that they had boycotted Russian products themselves.[64] By March 2015, the latter number had grown to 45 percent.[65]

There is also rich anecdotal evidence of Ukrainian firms trading with Russia being under relentless public pressure to discontinue such relationships. The pressure was in place even for firms trading only intermediate goods, such as automobile parts,[66] as well as exporting products, especially if buyers were somehow tied to Russian army providers.[67] Naturally, many Ukrainian companies reacted to the pressure by decreasing their trade with Russia.[68]

We first test the consumer-action hypothesis by assessing whether the reduction in trade across ethnic lines is more pronounced for traders of consumer goods. Columns 1 and 2 of Table 6 display the breakdown of the baseline results by the

[64] www.pravda.com.ua/rus/news/2014/05/15/7025437/ (in Russian).

[65] tsn.ua/ukrayina/bilshist-ukrayinciv-pidtrimuyut-boykot-tovariv-iz-rosiyi-doslidzhennya-420268 (in Ukrainian).

[66] For example, a large bus corporation was criticized for importing Russian inputs (www.volyn24.com/news/97774-bogdan-maie-vidmovytysia-vid-zakupivli-rosijskyh-detalej-gunchyk [in Ukrainian]), and another company faced pressure for producing buses with 95 percent of inputs coming from Russia (tsn.ua/groshi/tenderniy-skandal-ukrayina-zakupila-shkilni-avtobusi-u-virobnika-tehniki-dlya-armiyi-rf-713165.html [in Ukrainian]).

[67] For example, a firm faced severe public pressure for allegedly exporting engines to Russia that may have then been used to create military products (interfax.com.ua/news/economic/404613.html [in Russian]).

[68] Case studies abound coming from the construction, automobile, and aircraft manufacturing industries, in which firms declared that they would stop buying parts from Russia and selling the final product. For instance, an association of more than 700 companies in the construction sector pledged to abandon the use of Russian materials (kmb.ua/ua/news/kievgorstroj-otkazyvaetsya-ot-produktsii-rossijskogo-proizvodstva/ [in Ukrainian]). Another example is from the Ukrainian automobile producer AvtoKrAZ, which started to decrease its dependence on Russian products in 2014 and completely abandoned Russian components by early 2015, publicizing this process in the media (ukr.segodnya.ua/economics/avto/ukrainskiy-avtogigant-polnostyu-otkazalsya-ot-rossiyskih-komplektuyushchih-609274.html [in Ukrainian]).

Table 6—Consumer-Goods and Intermediate-Goods Traders

	Diff p-value: 0.039		Diff p-value: 0.071		Diff p-value: 0.157	
Specification:	Firms with $>$ 50% of transactions in consumer goods	Firms with $>$ 50% of transactions in intermediate goods	Import by firms with $>$ 50% of transactions in consumer goods	Import by firms with $>$ 50% of transactions in intermediate goods	Export by firms with $>$ 50% of transactions in consumer goods	Export by firms with $>$ 50% of transactions in intermediate goods
	(1)	(2)	(3)	(4)	(5)	(6)
Post-February 2014 × share of ethnic Russians	0.242	0.075	0.227	0.045	0.255	0.102
	(0.088)	(0.032)	(0.095)	(0.027)	(0.093)	(0.048)
Firm fixed effects	✓	✓	✓	✓	✓	✓
Year-month fixed effects	✓	✓	✓	✓	✓	✓
Dependent variable mean	0.187	0.208	0.190	0.191	0.185	0.204
Dependent variable st. dev.	0.390	0.406	0.392	0.393	0.388	0.403
Observations	86,097	443,012	40,560	278,064	54,438	231,426
Firms	1,929	9,742	845	5,793	1,266	5,382
Districts	215	365	90	288	202	309

Notes: This table presents the heterogeneity analysis of the baseline results by the percentage of trade transactions a firm makes in consumer or intermediate goods. Intermediate goods and consumer goods are identified by the transaction's HS6 product code using the BEC classification. The dependent variables are the indicator of any trade activity (export + import) with Russia by a firm in a given month in columns 1 and 2, the indicator of any imports from Russia by a firm in a given month in columns 3 and 4, and the indicator of any exports to Russia by a firm in a given month in columns 5 and 6. Inference across regression models is conducted using a similarly unrelated regressions framework. Standard errors are clustered at the district level.

share of firm's operations conducted with consumer or intermediate goods from 2013 through 2016.[69] According to the estimates, traders doing business mostly with consumer goods experienced a larger differential decline in trade by local ethnic composition. To further explore whether consumer action could play a role, we study import transactions separately from exports, further breaking down the results by firm type in columns 3 through 6 of Table 6. The results show that the differential effect is more pronounced for the frequency of import activity of consumer-goods traders relative to that of intermediate-goods traders. This pattern is consistent with the consumer-boycotts explanation, in which boycotts were more widespread in areas with fewer ethnic and cultural ties to Russia.[70] A similar consumer-intermediate heterogeneity pattern, albeit in a weaker form, is also present for exports (columns 5 and 6). Our preferred interpretation of this result is that exporters of consumer goods could still face consumer action in forms other than boycotts, e.g., in the form of higher reputational pressure due to greater firm visibility or possible consumer reaction within Ukraine.

Although comparing consumer- and intermediate-goods traders points to consumer action, ideally, we would want to obtain more direct evidence that its intensity matters for our estimates. To approximate the consumer-action intensity in Ukrainian provinces, we rely on relative popularity of online searches for *boycott*, which we

[69] Since the number of firms trading only consumer goods is not high, to increase power, we study them together with firms that spend some of their time trading intermediate goods as well.

[70] One may worry that, since firms are unlikely to sell all of the imported product in their district, districts may be too small as a unit of analysis. To assuage this concern, online Appendix Table F5 presents robustness of Table 6 to using province-level ethnic composition. The results remain largely unchanged and, if anything, increase in magnitude.

obtain from Google Trends.[71] Online Appendix Figure A13 shows, unsurprisingly, a strong negative association between the standardized *boycott* search intensity and the share of ethnic Russians in a region.[72] Columns 2 and 3 of online Appendix Table A16 illustrate that the differential effect of local ethnic composition is higher especially in provinces with higher boycott intensity; conversely, ethnicity does not matter as much in provinces where boycotts appear less widespread. Column 4 of online Appendix Table A16 shows that, after the start of the conflict, trade declined more in areas with higher boycott intensity.

Finally, we would like to obtain more evidence of reputational pressure beyond what we've shown through consumer action. While only suggestive, we document a pattern that is indirectly consistent with this conjecture. Specifically, we check whether our results are driven by large firms, which are traditionally viewed in the literature as more likely to be targeted by activists and to engage in corporate social responsibility activity (Perrini, Russo, and Tencati 2007; Smith 2013). Online Appendix Table A18 breaks down our main results by the size of the firm. For the purposes of this exercise, we call a firm large if it employs more than the median number of people (19 employees in our sample). Columns 2 and 3 present the difference-in-differences results for large and small intermediate-goods traders separately for all transactions (export + import); columns 4 and 5 display this breakdown for import transactions only, and columns 6 and 7 for export transactions only. Clearly, across all these specifications, the effect for large intermediate-goods traders is always significantly higher in magnitude relative to their smaller counterparts. Albeit indirectly, this pattern is consistent with higher reputational pressure on larger firms in areas with lower share of ethnic Russians to discontinue trade with Russia.

Taken together, these results suggest that local activism could be one of the mechanisms through which armed conflict disrupts intergroup trade. Consumer action leads to a stronger decline in trade of consumer products in less Russian areas of Ukraine, while reputational pressure could factor in trade decisions even for exporters to Russia and firms in the business-to-business sector.

D. *Discrimination at the Border*

The final hypothesis we test is discrimination at the border. That is, it could be that Ukrainian firms from less Russian areas face greater hostility from Russian customs officials.

We test this hypothesis by focusing on trade between Ukraine and Kazakhstan. Nearly all trade between these two countries uses ground transportation and, as a result, has to pass through the Russia-Ukraine border.[73] Thus, if Russian customs

[71] Specifically, these data cover February 1 to May 1, 2014, from Google Trends (2014). We restrict our attention to this time period so that the word *boycott* definitely refers to the boycott of Russian goods by Ukrainian consumers or to the boycott of companies affiliated with Russia in one way or another. It is possible that *boycott* may take other meanings in other months, which would then dilute our measure.

[72] This relationship is not confounded by differences in usage of Google search across Ukrainian provinces, as Google Trends calculates *relative* popularity of a search in each province, dividing the number of searches for a particular word by the total number of searches in a province.

[73] See the map in online Appendix Figure A14. For the breakdown of trade between Ukraine and Kazakhstan by mode of transportation, see page 4 of www.beratergruppe-ukraine.de/wordpress/wp-content/uploads/2016/04/PB_04_2016_en.pdf.

officials discriminate against Ukrainian firms from less Russian areas, we would expect it to appear in transactions between Ukrainian firms and Kazakhstan too. Columns 1 through 3 of online Appendix Table A19 replicate our baseline results, but for trade between Ukrainian firms and Kazakhstan. The Russian-ethnicity-post interaction coefficient is statistically insignificant and has the opposite sign relative to Table 2. These findings suggest that our results are not due to discrimination at the border by Russian customs officials.[74]

V. Implications for Firms

In the final part of this paper, we investigate the implications of the differential decline in trade with Russia for Ukrainian firms. The main motivation for this additional exploration is that the documented effect may actually be inconsequential for Ukrainian firms. That is, they could have switched to trading with partners in other countries or within Ukraine and, in the end, could have experienced no damage in terms of their overall performance. We evaluate the switching hypothesis in detail in online Appendix J and trace the implications for firms' accounting indicators in online Appendix K. Indeed, online Appendix J confirms that there is evidence that firms in less Russian areas switched to trading with other countries, such as Poland and Turkey. However, online Appendix K shows that, despite this switching effect, the decline in trade with Russia has negatively affected firm sales, profits, and productivity. We show this in a triple-difference specification comparing the pool of firms that were trading with Russia before the conflict with the pool of all Ukrainian firms. Overall, these results suggest that the decline in trade with Russia had a negative impact on firm performance.

VI. Conclusion

Armed conflict has vast, multifaceted effects on the economy. It can impact economic agents directly, through violence and property damage, or indirectly—e.g., by disrupting business relationships. While the existing literature offers plenty of evidence on the direct effects of conflict, indirect effects remain largely understudied. This paper provides evidence on one such type of indirect consequence: the disruption of intergroup trade outside of the conflict areas. We study the 2014 Russia-Ukraine conflict, which is unique for its near absence of immediately imposed trade restrictions. Using rich, transaction-level data on Ukrainian trade, we show that firms located in districts with a higher share of ethnic Russians experienced a smaller drop in trade with Russia relative to firms in other districts. Based on the additional quantitative evidence, we interpret our findings as arising from a decline in intergroup trust.

Our findings may have far-reaching implications for the economic development of fragile states. Ethnic heterogeneity has been associated at the macro level with

[74] One may object that, if the goal of the customs officials was to hurt Ukrainian firms from certain regions, discrimination would have been more pronounced for Ukrainian exporters, not importers. However, the results for the exports from Ukraine to Kazakhstan in columns 4 through 6 of online Appendix Table A19 suggest that this is not the case.

lower economic growth, lower public good provision, more frequent conflict, and lower trust (Alesina and Ferrara 2005). It has also been suggested that ethnic divisions, created by arbitrary colonial borders, have contributed greatly to Africa's underdevelopment (Easterly and Levine 1997). Our results indicate that ethnic heterogeneity may lead to lower economic performance in part because of reduced intergroup economic exchange resulting from frequent conflicts.

We hypothesize that our estimates may be especially applicable to conflicts in which the two sides are crucial trading partners or have been part of the same entity historically. One broad category of such conflicts is civil wars, in which trade embargoes are often not enacted or not strictly enforced.[75] As such, our results may be highly informative with regard to the numerous civil wars with an ethnic component (Ray and Esteban 2017). Still, more research is needed to determine whether our results will replicate in other contexts.

Our study also highlights the importance of analyzing economic activity in noncombat areas. Modern empirical studies of conflict tend to focus on comparing areas with violence to those without, leaving potential spillovers unexplored and unaccounted for. In contrast, we focus only on areas unaffected by violence directly and find that, even there, conflict hurts intergroup trade. In a companion project, we explore how the war in Donbas impacts the rest of Ukraine through the production network and the change in its structure (Korovkin and Makarin 2021).

It also remains unclear to what extent conflict affects other types of voluntary economic interactions besides trade, such as formation of business partnerships and collaborative innovation, and what the overall welfare implications of these effects might be. In summary, the impact of conflict on noncombat areas remains an understudied topic that would benefit from further scholarly work.

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[75] See, e.g., Leigh (2012) on the continued trade between the North and the South during the American Civil War.

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