The Forced Friendships of Friend-Shoring:
Firm-Level Evidence from the Eurasian Economic Union

PRELIMINARY

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Abstract: In assessing consequences of friend-shoring, the Eurasian Economic Union (EAEU), offers a unique recent case for retrospective analysis, because Kazakhstan increased external tariffs to Russia's levels to join the bloc's precursor customs union in 2010, and Russia later sought further trade within the bloc following international sanctions in 2014. We conduct the first firm-level analysis of the dynamic consequences of members' external tariff increases using data on trade transactions between the customs union's members since 2012. The data allows us to separate consequences on the intensive margin and extensive margin of trade between members, with a particular focus on Kazakhstan and Russia. In addition to the classical effects of trade creation and trade diversion from the union's integration, and increased external trade from Russia and Kazakhstan's WTO accessions, we explore the extent to which exports from Kazakhstan to Russia are persistently lower than expected due to the higher costs of imported inputs following Kazakhstan's external tariff increases in 2010. Our analysis is then crucial for understanding how Kazakhstan's external tariff increases relate to its low performance relative to peer countries in measures of global value chain integration.

Keywords: input tariffs, global value chains, export diversification, extensive margin, customs union

JEL codes: F13, F14, F15, F23

1. Introduction

Recent geopolitical conflicts such as the United States trade war with China and Russia's invasion of Ukraine draw attention to the possibility of policy aimed at increasing sourcing from geopolitical allies, known as friend-shoring and amplified most prominently in 2022 speeches by U.S. Treasury Secretary Janet Yellen (e.g., Yellen, 2022). One form friend-shoring could take is allies forming trade blocs with higher external trade barriers. International economists in the policy arena highlight the negative consequences of such trade barriers because they would limit gains from trade, increase trade diversion, and reduce resilience to macroeconomic shocks (Rajan, 2022; Benson and Kapstein, 2023). Further support for these claims comes from counterfactuals based on calibrated quantitative general equilibrium trade models with industry data (Javorcik et al., 2022; Clancy et al., 2023; Bolhuis et al., 2023). Evidence of actual supply chain consequences of external tariff increases for a trade blocs are limited, however, given that such episodes are rare in recent history, especially for periods when firm-level data are available.

A unique 21st century example of a country raising average external tariffs to join a trade bloc is Kazakhstan joining with Russia and Belarus through 2010 to join the Eurasian Customs Union, which preceded today's Eurasian Economic Union. Such tariff increases for customs union formation have been rare in recent decades, since raising bound tariffs to join a customs union would require complicated tariff renegotiations under the General Agreement on Tariffs and Trade (GATT), which remains the foundation agreement of the World Trade Organization (WTO). Kazakhstan though did not complete its WTO accession until 2015. Kazakhstan's accession to the Eurasian Customs Union then offers a rare opportunity to explore the effects of actual tariff increases to join a trade bloc.

Our paper uses firm transaction-level trade data and a major macroeconomic shock to assess supply chain consequences of Kazakhstan raising import tariffs to Russian levels. For our main results, we consider the lower resilience of firms and products exposed to input tariff increases, before and after the 19 percent devaluation of the Kazakhstani tenge in February 2014, which ended 5 years of successfully maintaining a fixed exchange rate. We find that exposure to input tariff increases has a substantial negative effect on product-level export growth after the devaluation. Though the tariff increases occur prior to 2010, our results reveal their persistent effects. Importantly, the negative effects occur even though the customs union is designed to create and divert within the union.

The main contribution of our paper is in documenting the negative supply chain consequences of external tariff increases based on actual increases in external tariffs. This adds evidence from actual policy changes for the negative consequences of friend-shoring which to date has focused primarily on counterfactual increases in quantitative models (Javorcik et al., 2022; Clancy et al., 2023; Bolhuis et al., 2023).

We contribute to a recent literature on the supply chain consequences of tariff increases and a longer literature on changes in input tariffs. The former literature studies how tariff increases on Chinese inputs US exports (Handley et al., 2020), and how U.S. antidumping duties affect downstream manufacturing (Bown et al., 2023), while our paper uniquely looks at how external tariff increases for a member of a customs union affects exports within the union. A long literature explores how input tariff decreases improve firm productivity (Amiti & Konings, 2007; Kashara & Rodrigue, 2008; Topalova & Khandelwal, 2022; Halpern et al., 2015) whereas we study persistent effects of input tariff increases. The analysis is a novel contribution to empirical analysis of trade policy, most recently surveyed prominently in Caliendo and Parro (2022).

Our paper relates to literature on consequences on exchange rate devaluations. While the textbook story is the developed countries expand exports (e.g. European Monetary System crisis) and emerging markets suffer from financial crises due to foreign currency borrowing and weak banking systems (e.g. Asian Financial Crisis). Research continues to focus on the role of financial frictions in export dynamics after devaluations (Kohn et al., 2020). Our work adds unintended consequences of trade policy as an additional channel through which firms cannot take advantage of export opportunities following a devaluation in emerging economies.

The rest of the paper proceeds as follows. Section 2 provides background on Kazakhstan's trade policy and monetary policy. Section 3 presents the data. Section 4 details methods and results. And Section 5 concludes.

2. Background

This section provides details on Kazakhstan's Trade Policy and Monetary Policy relevant for the analysis.

2.1 Trade Policy

The key points of trade policy are that Kazakhstan formed a customs union with Russia and Belarus in 2010, and gradually increased tariffs from 2004 to 2010 before entering the union. The customs union then gradually rolled back some of the decreases as Russia ascended to the WTO in 2012 and Kazakhstan in 2015.

The union today is known as the Eurasian Economic Union, since Armenia and Kyrgyzstan joined in 2015.

Several studies (e.g., World Bank, 2012; Carneiro, 2013) have considered ex-ante and ex-post consequences of the customs union using industry-level trade data and counterfactuals. The broad consensus of this literature was that the main benefits for members would be in non-tariff harmonization in agriculture and in free movement of labor to Russia and remittances.

2.2 Monetary Policy

We survey here a brief overview of recent monetary policy in Kazakhstan relevant for our sample period.

The main shock we exploit in the early years of the Eurasian Customs Union was a 19% devaluation in early February 2014. Kazakhstan successfully maintained a fixed exchange rate regime from February 2009.

A second major currency shock for Kazakhstan in the union occurred when the National Bank of Kazakhstan first allowed the tenge to float in August 2015, leading to an immediate 23% depreciation. We focus on the February 2014 shock because this was much more unanticipated. The August 2015 depreciation was much more anticipated given that the ruble had floated in November 2014, and this shows in the large increases in deposit dollarization through early 2015.

Kazakhstan has largely maintained conventional monetary policy with a floating exchange rate and inflation targeting since August 2015. After a period of substantial monetary interventions in the first months of the floating exchange rate regime, during which the IMF classified

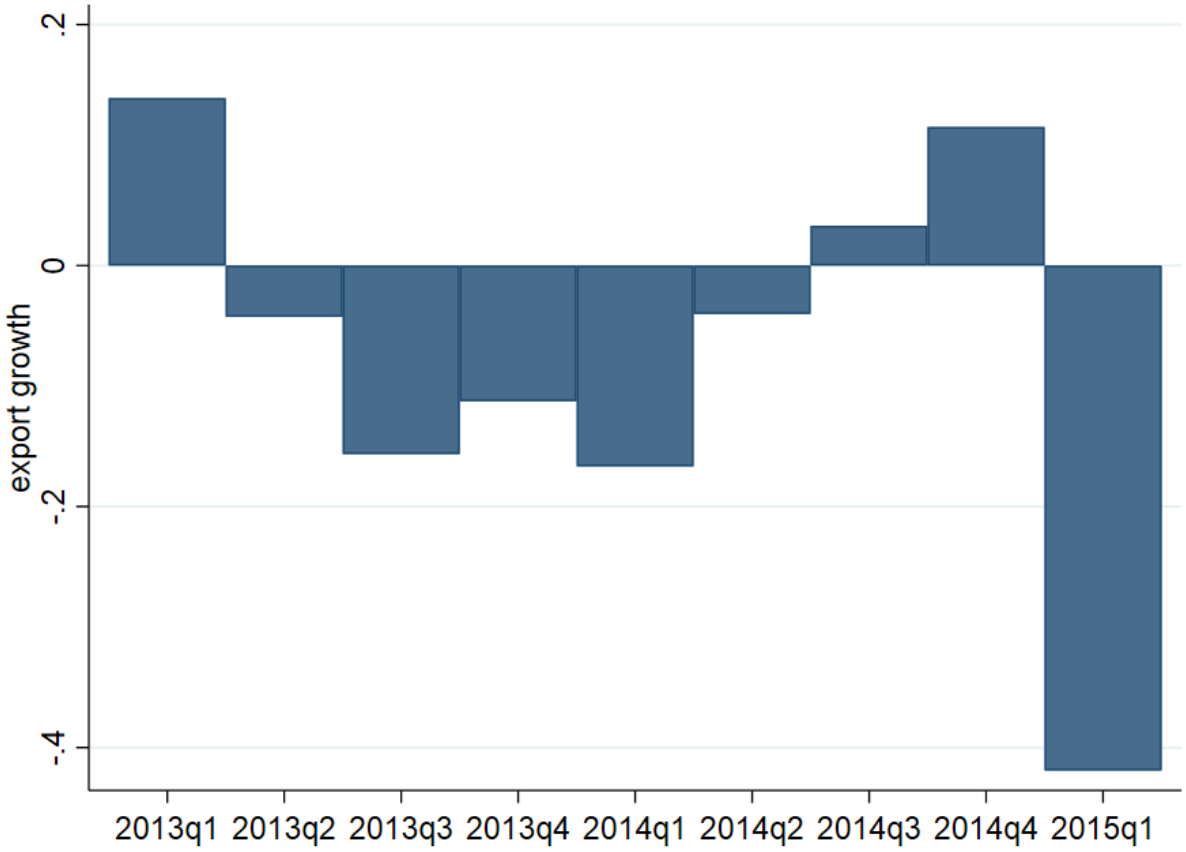
Kazakhstan as having an "other managed regime" (i.e. a managed float), Kazakhstan has been classified as a floating regime by the IMF since December 2015 (IMF, 2022). This classification still permits occasional foreign exchange interventions in times of exchange volatility. Kazakhstan adopted inflation targeting with a gradually decreasing band and a long-run goal of inflation under 4%. Kazakhstan was largely successful in hitting year-over-year targets from August 2016 and until the COVID pandemic started in March 2020.

3. Data

3.1. Data sources

First, we make use of the customs data obtained from the Bureau of National Statistics (BNS) of the Agency for Strategic Planning and Reforms of the Republic of Kazakhstan. The information comes from compulsory custom declarations filed by the Kazakh firms on a monthly basis that trade within the Eurasian Economic Union and include trade (both the value (in USD) and volume of imports and exports) by firm, product (defined at the ten-digit level of the Harmonized System (HS) code) and destination. The dataset covers the period between 2012m1 to 2020m12. The destination and sourcing countries include Armenia, Belarus, Kyrgyzstan, and Russia. Figure 1 shows the average 12-month growth rate of exports for each quarter starting from 2013q1 to 2015q1, revealing a noticeable decrease in export growth that commenced in the first quarter of 2014. This comprehensive weakening of Kazakh export growth highlights the significance of quantifying the spillover effects of import tariffs on supply chains.

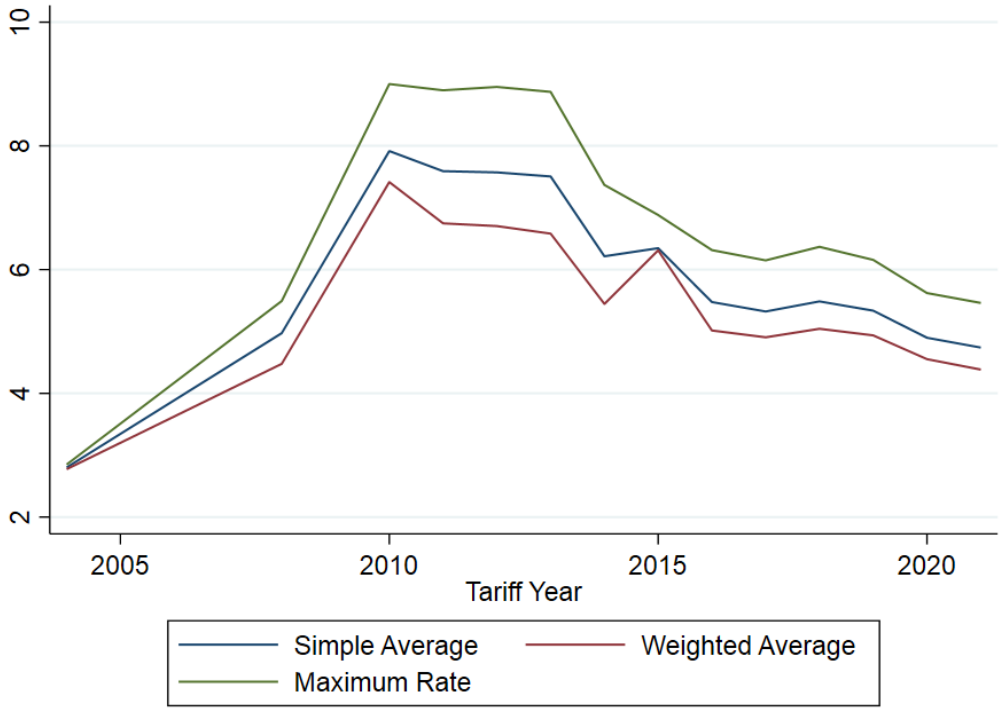
Figure 1. Quarterly export growth (year-on-year), 2013q1-2015q1



Source: Authors' calculations based on firm-level data.

Second, we merge the BNS data with the tariff data from the World Integrated Trade Solution (WITS) database which comes on an annual basis and includes information on applied tariffs applied by Kazakhstan on imports from the rest of the world at the 6-digit HS product code level. Figure 1 shows the evolution in applied tariffs in Kazakhstan between 2004 and 2021, indicating a significant rise from 2008 to 2010. During this period, Kazakhstan increased its external tariffs to match those of Russia to become a part of the customs union in 2010.

Figure 2. Applied tariffs in Kazakhstan (2004-2021), %



Source: Authors' calculations based on the WITS UN Trains applied tariff data.

Table 1 shows that most of the exporting firms (that also import) saw an increase in tariffs from 1 to 10% (32.6%), with 3.1% of them facing an increase in tariffs from 10 to 25% and 0.3% facing an increase from 25 to 100%.

Table 1. Share of exporters facing an increase in import tariffs (with at least one import product facing an increase)

	Increase in tariffs, %				
	(0-1)	[1-5)	[5-10)	[10-25)	[25-100]
Share of exporters	38.37	38.82	17.45	4.63	0.73

Source: Authors' calculations based on 2012 firm-level data and public-level tariff data for the year 2012.

3.2. Import tariff exposure measures

We rely on the empirical regularity that trade is persistent over time (Bernard et al. 2018), to construct our measures of products exposure to import tariff increases. The first two measures are based on the Handley, Kamal, and Monarch (2020) methodology (HKM), while the third measure takes into account the import share at the product level by exploiting the firm-level data.

We start by constructing a product level import tariff exposure measure (ITE) at the product level derived from the cross-sectional data for the year 2012. So, the ITE measure, by definition, is identical to HKM:

$$ITE_p^{Baseline} = \frac{Exporters_{p,2012}^{same\ HS4}}{Exporters_{p,2012}} \qquad \text{(eq. 1)}$$

where the denominator counts the number of unique exporters selling HS6 product p in 2012. The numerator accounts for a subset of these exporters who imported products subject to import tariff increases during the period 2008-2010. The baseline HKM method employs the HS4 heading, to define the set of imports that constitute a firm's export supply chain. For each HS6 product we calculate the total number of exporters in 2012 who imported at least one product subject to tariff increase that falls in the same HS4 category. The narrow ITE measure, instead, employs HS6 heading: we calculate the total number of exporters in 2012 who imported at least one product subject to tariff increase that fall in the same HS6 category:

$$ITE_p^{Narrow} = \frac{Exporters_{p,2012}^{same\ HS6}}{Exporters_{p,2012}} \qquad \text{(eq. 2)}$$

Finally, we consider an ITE measure that exploits firm level data to account for tariffs weighted by import value:

$$ITE_p^{Firm} = \left(\sum_{p}^{product} w_{ip} * (\Delta duties_i / \sum import_{ip}) \right) \qquad \text{(eq. 3)}$$

where $w_{ip} = export_{ip} / \sum export_p$ $\Delta duties_i = \sum import_{ip} * \Delta tariff_p$ and which presents the export share for each product p at firm i and $\Delta tariff_p$ is the change in tariff for every product.

Table 2 presents summary statistics, with means and standard deviations in parentheses, for all the exposure measures, employing three distinct definitions of supply-chain linkages. The first column corresponds to the baseline definition similar to HKM, the second column represents the narrow definition of HKM, and the third column corresponds to the new ITE definition that exploits firm level data.

The first row in the table focuses on the exposure measures constructed using 2012 BNS firm level data. Under the baseline definition, the $ITE_p^{Baseline}$ measure shows a mean value of 0.111. In contrast, the ITE_p^{Narrow} measure exhibits a smaller mean of 0.082, while the ITE_p^{Firm} has the smallest mean value of 0.008.

With respect to the baseline definition, for the average HS6 exported product, approximately 11% of exporters are found to import products that meet two criteria: (i) they face import tariff increases during the period 2008-2010 and (ii) they belong to the same HS4 category as the exported product.

Table 2. Summary statistics: ITE measures

	Mean	SD	Min.	Max.
$ITE_p^{Baseline}$	0.111	0.222	0	1
ITE_p^{Narrow}	0.082	0.189	0	1
ITE_p^{Firm}	0.008	0.017	-0.034	0.116

Source: Authors' calculations based on 2012 firm-level data and public-level tariff data for the year 2012.

4. Results

Our empirical methodology involves integrating import tariff exposure measures at the product level from the year 2016 with firm-level data spanning the period 2012 to 2015, encompassing monthly Kazakh exports at the HS6 product-month level. The primary focus of our study is to analyze the impact of increase in import tariffs on Kazakh export growth within the Eurasian Economic Union.

Following HKM, we use a generalized difference-in-differences (DID) estimation strategy, enabling us to assess whether there is a reduction in export growth for products with higher exposure to import tariffs (the first difference) during the years 2014-2015 compared to the preceding period of 2012-2013 (the second difference):

$$\Delta \ln exports_{ipt} = \theta_t \Delta \ln(1 + \tau_{pt}) + \beta ITE_p + \gamma ITE_p \times period + \alpha_{pq} + \varepsilon_{pt}, \quad \text{(eq. 4)}$$

We use log differences of exports relative to the same quarter in the previous year, denoted as $\Delta \ln exports_{ipt}$. This allows us to capture the log change in exports for each firm i and specific product (p) in a given quarter (t). The changes in import tariffs are represented as $\Delta \ln(1 + \tau_{pt})$. ITE_p serves as a measure to gauge disruptions in supply chains resulting from exposure to increased import tariffs. The ITE measure at the product level remains time-invariant and is constructed using information from firm-level trade flows and public-level tariff data in the year 2012. α_{pq} is product and quarter fixed effects and ε_{pt} is the error term. The coefficient of interest is γ - the average change in the effect of exposure before and after the increase in import tariffs.

In Table 3, we present coefficient estimates for the interaction between $ITE_p^{Baseline}$ and an indicator denoting the post-2014Q1 period, as specified in Equation (4). Our findings reveal that products with higher exposure to Kazakh import tariff increases experienced diminished export growth compared to less exposed products in the post-tariff period, compared to the same difference observed in the pre-tariff period. The coefficient in Column (1) indicates that a product at the mean of the $ITE_p^{Baseline}$ distribution (=0.306) experiences approximately 3 log points ((−0.754 × 0.157) × 100 = 11.84) lower export growth than a product with no affected exporters. Additionally, the table shows that an increase in foreign export tariffs, $\Delta \ln(1 + \tau_{pt})$, has no effect on export growth. Both the broad (Column 2) and narrow (Column 3) exposure measures lead

to similar conclusions: the rise in import tariffs had no significant effect on Kazakh export growth, whereas products with higher import tariff exposure experienced lower export growth.

Table 3. Export growth and import tariff exposure

	ITE HS4	ITE HS6	ITE FIRM
delta_ln_tau	-3.802***	-3.779***	-3.834***
	(1.367)	(1.367)	(1.365)
period=1	-0.297***	-0.293***	-0.295***
	(0.068)	(0.067)	(0.068)
period=1 # $ITE_p^{Baseline}$	-0.754**		
	(0.298)		
period=1 # ITE_p^{Narrow}		-1.203***	
		(0.403)	
period=1 # $\ln ITE_p^{Firm}$			-9.715**
			(3.912)
Constant	-0.119*	-0.127*	-0.092
	(0.069)	(0.069)	(0.069)
Product#quarter f.e.	Yes	Yes	Yes
R2	0.1405	0.1412	0.1419
Obs.	2721	2721	2727

5. Conclusion

Our results have immediate policy implications in economic diversification in resource-rich economies and industrial policy. Kazakhstan is a country that still maintains import substitution as an approach to economic diversification, and our study documents specifically how input tariff increases in the Eurasian Customs Union weakened the export diversification of Kazakhstan. Earlier work shows that the share of value added in Kazakhstan's exports fell from 20 percent in 2005 to 7 percent in 2015 (Arenas, 2020), and our study points toward an explanation for this decline in global value chain participation.

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Appendix

Figure 1. Quarterly export growth (year-on-year), 2013q1-2020q4

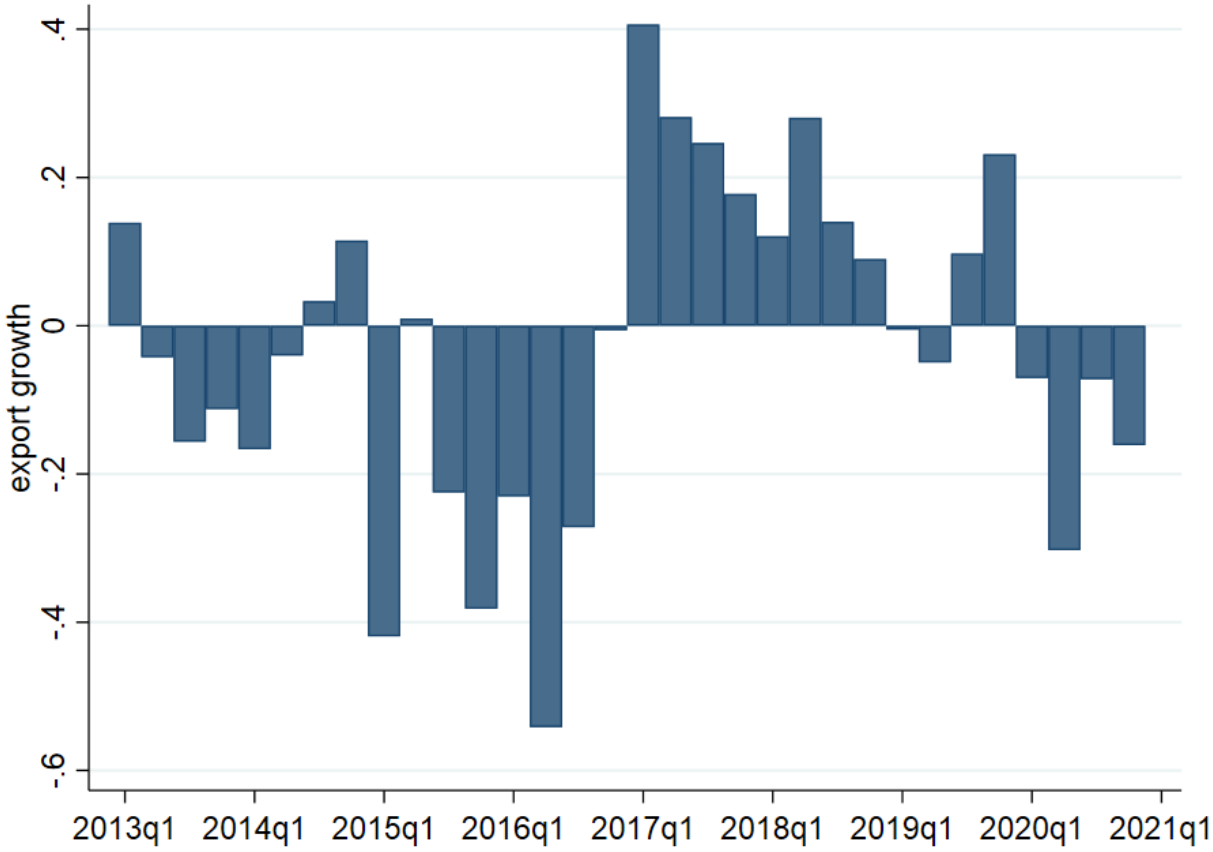

Table A-1. Exporters facing increase in import tariffs

	At least one product	Same HS4	Same HS6
Share of exporters	0.400	0.241	0.200
Share of exports	0.258	0.078	0.041

Source: Authors' calculations based on 2012 firm-level data for the year 2012.

Table A-2. Export sectors that are most and least affected by import tariffs

Panel A: most affected HS2 products	
HS2	Description
42	Articles of leather; saddlery and harness; travel goods, handbags and similar containers; articles of animal gut (other than silk-worm gut)
44	Wood and articles of wood; wood charcoal
73	Articles of iron or steel
84	Nuclear reactors, boilers, machinery and mechanical appliances; parts thereof
85	Electrical machinery and equipment and parts thereof; sound recorders and reproducers, television image and sound recorders and reproducers, and parts and accessories of such articles
Panel B: least affected HS2 products	
94	Furniture; bedding, mattresses, mattress supports, cushions and similar stuffed furnishings; lamps and lighting fittings, not elsewhere specified or included; illuminated signs, illuminated name-plates and the like; prefabricated buildings
82	Tools, implements, cutlery, spoons and forks, of base metal; parts thereof of base metal
19	Preparations of cereals, flour, starch or milk; pastrycooks' products
17	Sugars and sugar confectionery

Table 3. OLD: Export growth and import tariff exposure

	(1)	(2)	(3)
	ITE BASELINE	ITE NARROW	ITE NEW
$\Delta\ln(1+\tau_{pt})$	-0.004	-0.076	0.028
	(0.174)	(0.180)	(0.178)
period=1	-0.437**	-0.543***	-1.030**
	(0.178)	(0.197)	(0.411)
period=1 # $\ln ITE_p^{Baseline}$	-0.201**		
	(0.094)		
period=1 # $\ln ITE_p^{Narrow}$		-0.183**	
		(0.091)	
period=1 # $\ln ITE_p^{New}$			-0.126**
			(0.063)
Constant	0.067	0.068	0.068
	(0.076)	(0.079)	(0.076)
R2	0.3651	0.3717	0.3673
Obs.	1276	1116	1276

Robust standard errors in parentheses
* p < 0.1, ** p < 0.05, *** p < 0.01