The Cost of Borders: Evidence from the Eurasian Customs Union

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Abstract

How strongly can the reduction in bureaucracy and red tape at the border increase trade? To address this, we study an ambitious trade facilitation policy – the complete abolition of internal customs controls – in the Eurasian Customs Union. Using a structural gravity model with high-dimensional fixed effects, we find evidence that non-tariff trade facilitation strongly and robustly increases the number of newly traded products. The value of trade, however, reacts more strongly to a traditional tariff-driven diversion of trade towards union members. Trade facilitation policies can diversify bilateral trade, highlighting the importance of trade analysis at the extensive margin.

(JEL: F14, F15, F55)

1. Introduction

Following the reduction in tariffs throughout the world, policymakers are increasingly turning their attention to non-tariff barriers to trade. Reducing these barriers – which include product standards, slow customs processing and excessive paperwork – is a part of the *trade facilitation agenda* (WTO, 2019). Despite multilateral efforts at improving trade facilitation (Hoekman, 2016), administrative and technical burdens on international trade are still substantial in many parts of the world. However, it is still an open question which policies are most effective in reducing non-tariff trade barriers, and to what extent these policies are ultimately successful in raising trade. To address this issue, this paper studies the trade effect of one particularly ambitious trade facilitation policy: the complete elimination of customs borders within a customs union.

We make three contributions to the literature. First, we identify how trade facilitation policies impact the "border effect". Empirical trade literature found that international borders can cause drastic trade reductions. Since the onset of empirical assessment of border effects with gravity model of trade McCallum (1995), this effect is a "black box".[1] We disentangle this effect into specific tariff

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1. See the recent survey by Havranek and Irsova (2017).

and non-tariff components. A classic view of trade agreements is liberalization trade through tariff reductions, but recent literature has established that trade agreements have much farther reaching impacts that go beyond tariffs.

Second, we contribute to the literature that examines the heterogeneity of trade agreement outcomes based on the provisions of the agreement. Average effects can be misleading, because there is so much heterogeneity between agreements (Baier et al., 2019). We focus on customs controls as a particular dimension of a trade agreement and try to isolate the impact of this policy *on top of* the formation of the agreement. Specifically, we study the impact of removing internal customs controls in addition to average customs union effects using highly disaggregated trade flows.

Third, we help to explore the non-tariff channel of facilitating internal trade, which may not affect trade costs ad valorem but act more as a fixed cost (e.g., customs clearance, export certification, rules of origin documentation). This property makes it especially important to distinguish intensive and extensive margin effects, as fixed costs may primarily act through the extensive margin. Protection via non-tariff measures can be introduced through the "back door" using non-tariff measures in spite of apparently low tariffs (Grundke and Moser, 2019).[2]

We consider the experience of three middle income countries – Russia, Belarus and Kazakhstan – which established the Eurasian Customs Union (ECU) in January 2010. The initial trade agreement involved both the introduction of a common external tariff (CET) and the elimination of internal customs controls within the customs union (CU) territory. Prior to forming the CU, the member countries were already in free trade agreements (FTAs) which almost entirely eliminated internal tariffs, but non-tariff barriers remained high (UNECE, 2012, 2013; Vinokurov, 2014). For example, Russia and Kazakhstan continue to score poorly on the World Bank's *Trading Across Borders* index, which measures the time lost and cost incurred due to trade policies. In this setting, trade facilitation measures should be particularly effective in raising trade. Since the initial implementation of the ECU in 2010, the integration has deepened over time through the introduction of harmonized product regulation, common anti-dumping procedures, and other standards.

One possible confounding factor for our analysis is that external tariffs may change when a CU is formed, simultaneously with the reduction in non-tariff costs.[3] This could potentially lead to trade diversion from non-member countries. Importantly, while average tariffs certainly rose for some members after the CU formation, a significant share of goods was not affected. To isolate the effect,

2. See also the recent study (Felbermayr et al., 2019) on the widespread use of rules of origin in FTAs that appear to be unjustified based on trade deflection risks alone.

3. Some early studies of ECU, such as Isakova et al. (2016), focused on trade diversion. They find some evidence of trade diversion away from China, but the magnitude is limited.

we break down our sample of highly disaggregated products (at the HS 6-digit level) into different groups where external tariff changes were minor or tariff levels were low throughout the sample period. We then estimate the model separately for each group to find the non-tariff impact. One important advantage of our setting is that internal tariffs were already eliminated ahead of the trade facilitation measure, since the ECU countries were in an FTA before.

Our empirical analysis is based on the structural gravity model, estimated using Pseudo Poisson Maximum Likelihood (PPML) with high-dimensional fixed effects. We include importer-product-year, exporter-product-year and importer-exporter-product fixed effects. The result is a triple difference-in-difference estimate, where the benchmark comparison group is trade with MFN partners.

We find evidence that non-tariff trade facilitation has a moderate trade-promoting impact at the intensive margin, and a very large impact at the extensive margin. We find gains in internal trade value of 13% to 15% that we can attribute to the removal of internal border controls, which is clearly an economically important magnitude. Notably, this effect is an additional boost to the general customs unions effect included in the controls. However, the estimates are not consistently statistically significant, suggesting heterogeneity across sectors. For the all-goods sample, where tariff and non-tariff effects come together, we estimate a statistically significant trade increase of 35%. With reference to the earlier results, we would attribute a majority of this impact to trade diversion.

We find that non-tariff trade facilitation raised the share of products traded within the CU by 7 to 8 percentage points, corresponding to about 365-418 newly traded products. The estimates are significant and robust across specifications. These gains at the extensive margin appear to be fully driven by non-tariff facilitation rather than changes in preferential tariff margins. The extensive margin effect is driven by the reduction in fixed costs of exporting affecting the entry decision of firms. Compared to this, the intensive margin effect estimates are similar in magnitude but less robust.

Furthermore, we examine the heterogeneity of the non-tariff trade facilitation impact as we move along the value chain. In our analysis, we distinguish three processing stages: primary, intermediate, and final. Our results suggest some heterogeneity by processing stage, and that the distinction between extensive/intensive margin is also important here. Final goods trade at the intensive margin is predominantly driven by the tariff preferences. In contrast to the intensive margin, the increase of the variety of products traded is similar across goods of different processing stage: the share of product lines with positive trade among ECU member states increases by 7.2% to 9%. Our findings

suggest that increase in the variety of products traded is largely unrelated to tariff changes and driven by non-tariff liberalization.

A series of papers has examined the effects of trade facilitation in the context of the European Union. Studying a cross-section of countries, Chen (2004) finds that in particular the reduction in technical barriers can increase trade. Focusing on EU enlargement, Hornok et al. (2010) show that trade creation due to non-tariff effects can be sizable – with the EU accession countries reaping the largest gains. These papers provide evidence that trade facilitation matters in a developed country setting, but to some extent suffer from the fact that EU membership is a very far-reaching policy with gradual implementation, making it difficult to disentangle the precise mechanisms at work.[4] An interesting recent contribution by Felbermayr et al. (2018) is related to our study as it breaks down the total EU effect to the customs union, single market, and Schengen agreement effects, with the latter one having a much smaller effect. Secondly, to our knowledge, existing works focus on intensive margin effects, leaving aside the potentially crucial extensive margin channel. A rare exception is the study by Handley and Limao (2015) on the increase in market entries from Portugal's EU accession due to reduction in tariff policy uncertainty associated with the membership in a trading block.

2. Background: The Eurasian Customs Union

The Eurasian Customs Union was formed with the *Joint Statement on the Establishment of the Customs Union* in 2009, comprising the member states Russia, Belarus and Kazakhstan. This followed a number of "false starts" in regional economic integration among these member states. The implementation of the ECU was swift: starting from January 2010, the three countries implemented a Common External Tariff (CET), which largely harmonized external tariffs among the member states. Thus, the tariff structure in some member states was significantly affected; in particular, Kazakhstan experienced a significant increase in average MFN tariffs.

A particularly far-ranging trade facilitation measure was the abolition of internal customs controls. This was an ambitious step towards the creation of an Eurasian single market (Wolffgang et al., 2013). According to the official web site of the Eurasian Economic Union,[5] customs controls were removed in 2010. However, in practice, implementation of the removal of customs controls was delayed at the Kazakh-Russian border points until 2011.[6] Thus, in the analysis that follows, we

4. The effect is as far-reaching as shifting the production structure (Breinlich et al., 2018).

5. http://www.eaeunion.org/#about-history

6. http://web.archive.org/web/20110703080255/http://www.itar-tass.com/c13/177231.html

explore the timing of actual implementation, coding the removal of customs controls for Russia-Belarus for 2010 and Russia-Kazakhstan for 2011.

Krotov (2011) presents a detailed discussion of the Customs Union's administration system, customs legislation and clearance. He finds that the Customs Union has been functional by 2011 and, although the rules were yet to be fully formed, the necessary institutions and legislation for the Customs Union's work have already been in place. Perhaps the most ambitious change brought about by the ECU has been the formation of a Eurasian single market (Wolffgang et al., 2013)

The ECU is backed by a set of intergovernmental organizations to oversee the governance and implementation of ECU policies. The Supreme Eurasian Economic Council, consisting of heads of member states, oversees the integration strategy while the heads of governments convene in the Eurasian Intergovernmental Council (IGC) to deal with regulation at a more granular level, including the approval of the budget (Vinokurov, 2017). The Eurasian Economic Commission has been the union's regulatory body since 2012.

To visualize the impact of ECU, we compare the growth in internal trade of the CU members with the growth in imports from FTA partners and the rest of the world (MFN). The first year of the sample, 2006, is set as the base year. We compute for each ECU member state an index of imports for each of the three groups relative to the base year. Then we take a simple average of the indices of the member states. This approach has the advantage that it does not give too much weight to Russia. It also approximates what the gravity equation does, where the unit of observation is country pair-product-year.

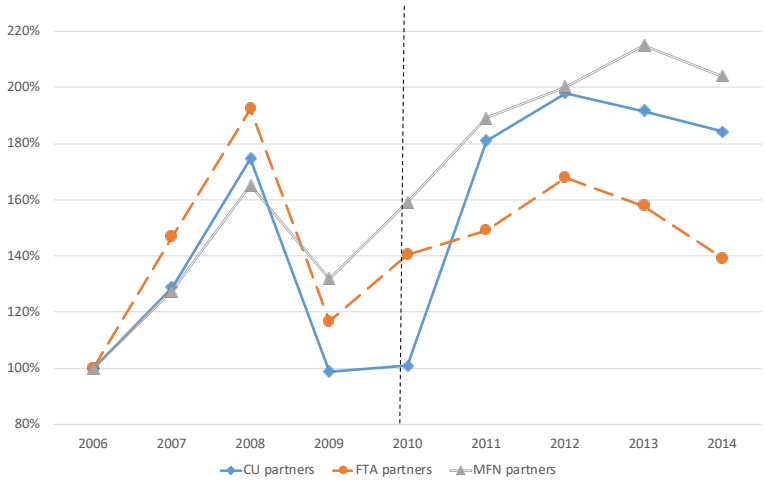
Figure 1 presents the trade trends at the intensive margin. For all groups, there is a large volatility in imports over time, partly driven by exchange rate fluctuations. Similarly, there is a sharp decline in imports from all groups in 2009 due to the financial crisis; this is followed by a rapid recovery, again for all groups. These patterns hold for the all-goods sample as well the constant-tariffs sample[7], as shown in parts (a) and (b) of the figure respectively.

Trade among ECU members was in relative decline before ECU formation for the all-goods-sample. This is shown in figure 1(a). By 2009, ECU's internal trade was below the level in 2006 – even in nominal terms – while trade with MFN and FTA partners had grown by 30% relative to 2009. The ECU was to some extent a reaction to this decline, which can be seen as an example of endogenous formation of a trade agreement (Egger et al., 2011). The formation of a CU led to a quick growth in CU internal trade relative to other groups. From 2010 to 2012, internal trade nearly

7. Requirement for inclusion: tariffs must be unchanged *in each member state* throughout the sample period.

FIGURE 1
Impact of Removal of Customs Controls: Intensive Margin

(A) All Goods



(B) Constant Tariffs

Notes: For each ECU member country, the value imports in USD by RTA partner type (grouped into CU, FTA or MFN) was indexed relative to the 2006 level. We then calculate a simple average across members for each year and RTA partner type, which is shown in the figure. The vertical line in 2010 indicates the timing of ECU implementation.

doubled. However, at the same time, trade from other groups also increased, although from a higher base. All combined, this suggests that the ECU was able to reverse earlier relative decline.[8]

External tariff changes explain partly the internal trade increase, as the trade changes in the products with no tariff changes are somewhat different. Figure 1(b) focuses on the set of products for which tariffs were constant throughout the period. Here, internal CU trade and MFN imports moved in lockstep until 2008, when the financial crisis appears to have had a stronger impact on internal CU than MFN trade. After the formation of the CU, internal CU trade again increased to the same growth rate as MFN imports by 2012. This figure suggests that non-tariff factors are important, an issue we analyze more formally in a gravity model below.

Figure 2 suggests that non-tariff trade facilitation brought by ECU had a very strong impact on the variety of products traded internally. Figure 2(a) again shows the relative decline in ECU internal trade before 2010. Averaged across the member states, the number of lines traded fell by around 7%. There was also a smaller reduction at the extensive margin for MFN partners, but from a higher base. After the ECU formation, there was a rapid increase in the number of goods traded internally. By the end of the sample period, the product diversity within the ECU had increased by 15%. At the same time, product diversity from FTA or MFN partners remained broadly unchanged.

The increased product variety pattern also holds for the constant-tariffs-sample. If anything, as shown in Figure 2(b), the increase in internally traded goods variety was even *stronger* for the constant-tariffs category. This suggests that non-tariff facilitation can play a key role in promoting trade at the extensive margin.

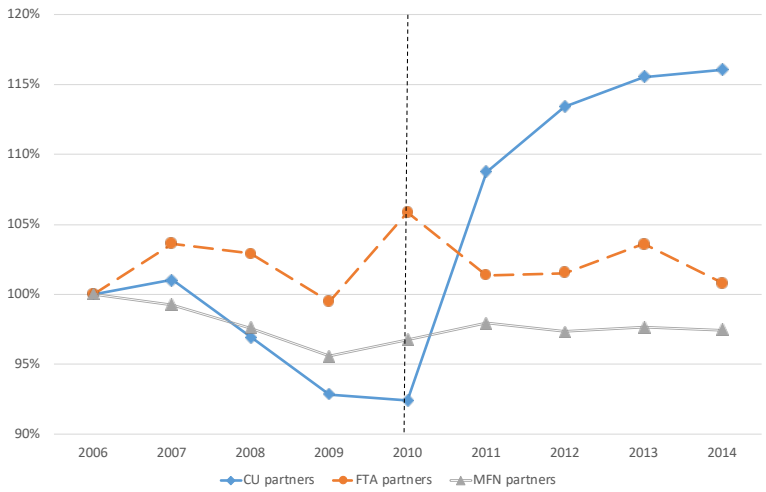
This exploratory analysis makes some important contributions to the empirical understanding of customs unions. In line with the prior literature, we find that CUs – as a relatively deep trade agreement – strongly promote aggregate internal trade. This effect, however, is partly driven by trade diversion as external tariffs change upon CU creation. In this regard, the trade creation record of the ECU appears to be in line with other CU projects that have been studied.

However, the truly large trade promotion effects are at the extensive margin. The ECU removed frictions at the border: internal customs controls, simplified bureaucratic procedures (VAT), etc. These are non-tariff measures, which apparently gave a large boost to the number of lines traded. This growth in internal product diversity is similarly strong for the constant and all-goods sample.[9] While the newly traded goods are likely to account for a small share of total internal trade value,

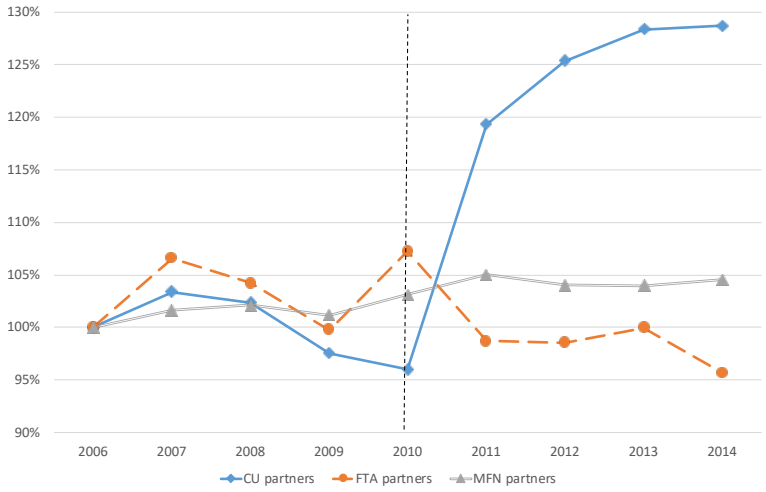
8. See appendix table A1 for details on total imports and import shares of ECU member states.

9. See also appendix table A2 for details on the numbers of lines traded before/after ECU formation.

FIGURE 2
Impact of Removal of Customs Controls: Extensive Margin



(A) All Goods



(B) Constant Tariffs

Notes: For each ECU member country, the number of HS6 lines with positive trade by RTA partner type (grouped into CU, FTA or MFN) was indexed relative to the 2006 level. We then calculate a simple average across members for each year and RTA partner type, which is shown in the figure. The vertical line in 2010 indicates the timing of ECU implementation.

increasing the variety of products traded may be an important objective in itself, e.g. to promote economic development.[10]

3. Data

Bilateral trade flows were obtained from UN COMTRADE at the 6-digit level according to HS2002 classification and cover the period from 2006 to 2014. Our sample includes 170 importers, generating a total of 20,040 importer-exporter pairs, and contains essentially all of world trade. We use import trade value in USD as our measure of trade.

Due to data quality issues affecting specifically the ECU member countries, some adjustments were required. First, Russia did not report disaggregated trade flows for Belarus and Kazakhstan in the early sample years. However, the respective partners publish disaggregated export statistics throughout the sample period, which – in terms of totals – correspond closely to the Russian import totals. Therefore, we use mirror data for these country pairs; for consistency, mirror data are used for all pairs. Second, Kazakhstan did not report trade values with CU partners for the second half of the year 2010. To address this issue, we use mirror data for the Kazakhstan-Belarus imports and add a dummy variable "underrep" (for underreporting) for Kazakhstan-Russia trade in 2010, as the Russian-reported data are not disaggregated.

Data on the bilateral trade preference regimes and trade agreements come from Baier et al. (2014). The database provides bilateral trade agreements until 2012. In order to include years 2013 and 2014, we extrapolate the agreements in the last two years as in 2012. This assumption is not very demanding as trade agreements are rarely downgraded, and the creation of new ones is a slow process. Before the formation of the ECU, Russia and Belarus were in a bilateral customs union (which the source data set incorrectly codes as an FTA, the only change we make to the Baier et al. (2014) dataset). The Russia-Belarus customs union is reflected in a high degree of tariff harmonisation before the formation of ECU, with close to 80% of MFN tariff lines in Russia and Belarus harmonized by 2009.

Tariff data, also at the six-digit level, comes from UNCTAD and were obtained from the World Bank's TRAINS platform for the period of 2006-2014. MFN tariffs are absorbed by importer-year fixed effects and only preferential tariffs are estimated. Before the formation of the ECU, internal tariffs between the members were largely eliminated. Our data set records just 8 lines where Russia imposed tariffs on its partners – involving sugar, alcohol and tobacco – in the immediate pre-CU

10. The European Union's GSP program has an explicit objective to diversity export structure, for example.

years. For Kazakhstan, there are 36 positive lines covering similar products and additionally some rice varieties. Our data set has no record of positive internal tariffs imposed by Belarus. From 2010 onwards, internal tariffs had been fully eliminated.

In some regressions, we distinguish goods by their stage of processing. We estimate separately the impact of non-tariff trade facilitation on primary, intermediate and final goods. To classify the HS-6 products into these groups, we follow the method of Altomonte et al. (2013) that first maps HS-6 products to the Broad Economic Classification (BEC classification; we use version 4) and then we further reclassify the BEC into primary/intermediate/final using the Standard National Accounts (SNA) categories.

4. Empirical Strategy

Gravity

We build upon the "structural gravity" framework developed by Anderson and Van Wincoop (2003), and extended for product-level data. Olivero and Yotov (2012) develop a dynamic version of the structural gravity model that leads to the estimation equation for panel dataset. The structural gravity model, adapted for the industry level panel data analysis, results in the following gravity equation (see Head and Mayer (2014) and Yotov et al. (2016) for a detailed exposition and evolution of gravity model estimations). We estimate the model using Poisson pseudo-maximum likelihood estimation with the module of Zylkin (2018).

The starting point is the equation:

$$X_{ijkt} = \frac{X_{ikt}}{P_{ikt}^{1-\sigma}} \times \frac{Y_{jkt}}{\Pi_{jkt}^{1-\sigma}} \times \frac{1}{Y_{kt}} \times T_{ijkt}^{1-\sigma} \tag{1}$$

where the time dimension t is measured in years, and X_{ijkt} denotes imports of destination country i from origin country j of good k, our dependent variable of interest. The elasticity of substitution between product varieties of different exporter countries enters as $1-\sigma$ and must be negative, so we require $\sigma > 1$. In our baseline estimates, we hold σ constant across products. The equation then consists of four terms: first the ratio of import expenditure to inward trade barriers, $\frac{X_{ikt}}{P_{ikt}^{1-\sigma}}$, which varies along the importer-product-year dimension. Second, the ratio of production to multilateral resistance ($\frac{X_{ikt}}{P_{ikt}^{1-\sigma}}$) for a given exporter-product-year. Third, $\frac{1}{Y_{kt}}$ contains the reciprocal of global production of good k in a given year. Following the standard in the literature, we will absorb these three terms through a set of high-dimensional fixed effects as discussed below. Finally, $T_{ijkt}^{1-\sigma}$ contains bilateral trade costs, which vary along both the product and time variation, and contains our covariates of interest.

Bilateral trade costs include pair-product fixed effects, several time-varying controls and our variables of interest. The pair-product fixed effects absorb time-invariant factors at the dyad-product level, which partly control for endogenous selection into trade agreements. Furthermore, there are several controls for preferential trade agreements. We distinguish Partial Scope Agreements (PSA), FTAs, CUs, and unilateral preferences under the Generalized System of Preferences (GSP), based on Bergstrand et al. (2015). In addition, bilateral time-varying trade costs include our central variables of interest that are concerned with the removal of customs controls within the ECU. We distinguish the effect of customs controls removal on internal trade within the CU, and on partners with which CU members have an FTA. The resulting expression for bilateral trade costs is:

$$T_{ijkt} = exp[\alpha_{ijk} + \theta \text{noborder.cu}_{ijt} + \gamma \text{noborder.fta}_{ijt} + \Psi \mathcal{X}_{ijt} + f(t_{ijk})] \quad (2)$$

The dummy variable noborder.cu$_{ijt}$ takes value 1 only for observations where trade is between ECU member countries i and j in the years after internal customs controls were abolished. The associated coefficient measures whether members trade more internally relative to MFN partners as a result of this policy change. We expect the estimated coefficient $\theta > 0$ based on theory. Next, countries that have an FTA in place with CU countries might see their preferential position relative to the MFN partners erode by the move of customs controls to external borders of the customs union. This effect is measured with an analogous dummy noborder.fta$_{ijt}$, and its coefficient γ, which we expect may be negative or zero.

Identifying Variation

Because we use country-pair fixed effects, only changes in bilateral trade costs enter into the estimation. For Belarus-Russia, we have the most direct evidence on border removal. Throughout the sample period, the two countries operated an effective customs union with a high level of external tariff harmonization. Moreover, tariff changes after the introduction of ECU were relatively minor. Thus, the most important change to bilateral trade costs for this dyad was the removal of internal border controls.

Kazakhstan initially had an FTA in place with both Russia and Belarus. Its accession to ECU happened in two stages: first, harmonization to ECU external tariffs (2010), and removal of internal borders in the following year. So with Kazakhstan, we have the year 2010, where only CU applies. For the later years, we additionally set noborder.cu$_{ijt}$ to 1 for trade with CU partners and noborder.fta$_{ijt}$ for trade with FTA partners.

Sub–sampling

The ECU brought changes to external tariffs as well as non-tariff factors for all members. The MFN tariff changes brought by ECU can have an impact both on the countries that pay the MFN rates and those that enjoy free trade. Indeed, a higher tariff imposed by an ECU member puts the partners enjoying duty-free trade in a better position. In the case of the customs union of Russia, Belarus and Kazakhstan, this argument is quite relevant. Although the internal tariffs were zero already before the CU, the MFN tariffs saw significant changes due to harmonization. Increase in MFN tariff should be positively associated with the intra-CU trade and trade with the FTA partners.

To isolate the non-tariff effects of trade facilitation, we exploit that for some products there were practically no changes in MFN tariffs, while for other products the changes were minor or tariff levels remained always modest. Instead of imposing a specific functional form for tariff elasticities when controlling for preference margin, which may be problematic, e.g. if tariffs are set endogenously, our identification strategy focuses on separately estimating the model for products where tariff effects were by construction minor, and therefore can be neglected in the first approximation. For such groups, the ECU primarily had a non-tariff impact.

For the empirical analysis, we use four criteria to identify the products where tariff levels were low or changes were small. First, we have two criteria focusing on low tariff levels. The most strict criterion we use is that products had zero MFN tariffs throughout the entire sample period in all ECU member states ("MFN zero"). By definition, in this group there were not only no changes in preference margins, but also no preference margin can exist. The downside is that this group contains only 302 HS6 tariff lines (less than 6% of all possible goods).[11] The second criterion to identify the group is more relaxed and includes all products for which the ECU members charged MFN tariffs of 5% or less throughout the sample period (denoted "MFN $\leq$5%"), so preference margin effects were always small. There are 2,022 tariff lines in this group.

Second, we consider two criteria to capture products where tariff levels were stable irrespective of the changes in CU membership. One criterion, denoted "MFN constant", includes the 1,650 products for which the MFN tariff changed by not more than 1 percentage point in each member state throughout the entire sample period.[12] Finally, the weakest inclusion criterion contains instances where the MFN tariff change in each country was not more than 5 percentage points throughout the sample period. This criterion, denoted "Δ MFN $\leq$5%", yields 3,243 tariff lines, or 62% of all tariff

11. Appendix table A3 summarizes the number of product lines in each sample.

12. Many products have specific import tariffs that are charged per unit. The reported ad-valorem equivalents of these tariffs can vary from year to year without any change in the tariff. We use 1 percentage point threshold for such minor variations.

lines. As a benchmark, we also report regression results for the all goods sample, which contains 5,223 tariff lines; in this regression, the trade changes through changing preference margins and non-tariff trade facilitation are combined into a single coefficient.

In our results tables, regressions are reported in the order of decreasing stringency of the sub–sample criterion.

Intensive/Extensive Margins

Trade facilitation has a strong potential to reduce the fixed cost of exporting, and thereby should contribute to the entry decision. This is expected to raise trade at the extensive margin, in other words the variety of products traded. To test for the presence of this effect separately from trade value effects, we conduct further regressions.

Our measure of trade on the extensive margin is the share of tariff lines with positive trade flows, as in Gnutzmann-Mkrtchyan and Henn (2018), Martincus et al. (2015) and Silva et al. (2014). Particularly, we calculate for each importer-exporter-year combination the number of goods with positive trade and then the share of goods with positive trade in the total number of goods in the sample. This means that with different subsamples, the goods coverage changes and also the number of goods with positive trade. Thus, for each sub-sample, we re-calculate the share of goods with positive trade.[13] We proceed similarly for the stages of production analysis at the extensive margin.

For estimation, we rely on OLS, with the share of goods with positive trade flows as the dependent variable. Silva et al. (2014) propose the *flex* estimator for the extensive margin setting. However, the estimator cannot be implemented in this study because we require three sets of high-dimensional fixed effects. Therefore we use OLS for estimation, which as shown by Silva et al. (2014) outperforms the alternatives log-linear, Poisson and negative binomial.

5. Results

5.1. Baseline

Baseline results for the intensive margin are shown in table 1. Columns 1 to 4 present sub-samples where tariff changes played no or only a minor role as discussed in Section 4. The idea is that for groups where tariff changes were small (or the tariff level was low to start with), the ECU mostly had

13. For example, in the sample with constant tariffs, there are 1,650 products included. So we first calculate how many out of these 1,650 products are traded for each importer-exporter-year. We then calculate the share.

a non-tariff impact. Column 1 presents regression results for "MFN zero" sample, column 2 contains "MFN constant" sample results, column 3 - "MFN $\leq$5%", and column 4 presents results for the largest sample "Δ MFN $\leq$5%". Finally, column 5 presents the all-goods sample.

The "MFN constant" (column 2) and all-goods sample (column 5) present two extremes of restricting sample to no tariff changes throughout the sample and no sample restriction. The former sample allows to capture impact of non-tariff facilitation, the latter - combined tariff and non-tariff impacts. For this reason these two samples are used in the presentation of descriptive statistics in 2 and in the robustness checks. Samples in columns 3 and 4 include products with moderate tariffs or moderate changes in tariffs and thus include some tariff-related impact. However they also cover much larger share of trade and provide more identifying variation than the "MFN constant" sample. For this reason they are considered the preferred samples in the baseline analysis.

Throughout columns 1 to 4, where tariff changes were small, the point estimate for the impact of customs check removal on internal CU imports ranges from 0.12 to 0.14. This suggests an economically meaningful increase in internal trade driven by non-tariff trade facilitation; importantly, this effect is an additional boost to the general customs unions effect included in the controls. However, there is a lot of variation within each subsample. For the preferred columns 3 and 4, the coefficients are statistically significant at the 10% and 5% level respectively. In the most restricted subsamples, the coefficients are not statistically significant, reflecting the narrow sample. Finally, for the all goods sample, the point estimate for non-tariff trade facilitation is far higher at 0.30 and also statistically significant at the 0.1% level. As we control for MFN tariffs through fixed effects, this stark difference highlights the importance of changing preference margins.

Our results indicate that CU internal trade facilitation had no impact on FTA partners, either beneficial or adverse. These countries had duty free access to the markets by the ECU member countries before and after formation. They were impacted by ECU in two ways: first, any increases in MFN tariffs of the ECU members would increase their preference margin. Second, any improvements in non-tariff trade facilitation for internal CU trade would only decrease their effective preference margin. On balance, these effects appear to cancel out as the coefficient estimates are small, the signs are unstable and mostly statistically insignificant.

Findings for the controls are in line with earlier literature. First, unilateral preference through the GSP program have moderate positive effects on trade values. Partial scope agreements have no impact. FTAs have a moderate impact on trade, which is very precisely estimated at about 5%. Finally, customs unions as a deep preferential trade agreement yield large trade gains exceeding 35%. Lastly, as expected, the underreporting control is highly significant. Since a half year of data was missing for

TABLE 1
Removal of Customs Controls: Intensive Margin Impact

PPML Model[1]	(1)	(2)	(3)	(4)	(5)
Dependent variable:	Bilateral product-level imports (USD)				
Sample[2]	MFN zero	MFN constant	MFN $\leq$5%	Δ MFN $\leq$5%	All
No Customs Checks $\times$					
CU Partner	0.144	0.122	0.125^{+}	0.113*	0.302***
	(1.40)	(1.40)	(1.88)	(2.22)	(5.62)
FTA Partner	-0.212^{+}	-0.055	-0.03	0.072	0.063
	(-1.73)	(-0.73)	(-0.48)	(1.44)	(1.44)
Controls					
GSP	0.07	0.063*	0.06	0.056^{+}	0.067^{+}
	(1.43)	(1.98)	(1.58)	(1.77)	(1.92)
PSA	-0.003	0.005	-0.001	3.1e-4	-0.002
	(-0.09)	(0.17)	(-0.02)	(0.01)	(-0.07)
FTA	0.03	0.048*	0.047*	0.052**	0.052**
	(0.76)	(2.05)	(2.32)	(2.93)	(3.22)
CU	0.188^{+}	0.304***	0.312***	0.310***	0.328***
	(1.87)	(4.67)	(5.00)	(5.93)	(6.15)
Underreported[3]	-0.943***	-0.994***	-0.886***	-0.735***	-0.755***
	(-7.50)	(-9.86)	(-8.41)	(-9.53)	(-11.90)
N	4,576,521	14,884,630	21,072,199	34,443,068	61,189,988
R-sq	0.9952	0.9908	0.9933	0.993	0.9863

Notes: +,*, **, *** denote 10, 5, 1, 0.1 per cent significance levels, based on robust standard errors clustered by country-pair-product combinations.
[1] Regression includes importer-exporter-product, import-product-time and exporter-product-time fixed effects.
[2] Column (1) contains products that had zero MFN tariff throughout the sample period in all ECU countries. Column (2) contains products that did not have a change in MFN tariff by more than 1% in the sample period in all ECU countries. Analogously, in column (3) we consider products with low MFN tariffs (less than 5%). Column (4) considers products with tariff changes (not more than 5% increase or decrease). Finally, column (5) contains all products.
[3] See Section 3 for explanation.

the affected country pair (imports from Kazakhstan to Russia in 2010), the point estimate of around -47% ($e^{-0.755}$) is in line with expectations.

The customs-related trade facilitation had a very strong effect on trade at the extensive margin. Results are shown in table 2. In this table, the dependent variable is the share of tariff lines with positive trade for a given bilateral pair. In the preferred subsamples, we estimate that non-tariff trade facilitation, namely the removal of customs controls, raised this share of positively traded goods by 7 to 8 percentage points. This estimate is a highly statistically significant at the 1% or even the 0.1% level respectively. Interestingly, results for the other subsamples – including those of all goods and the most restrictive (MFN zero or MFN constant) subsamples – are practically identical. This suggests that the trade growth at the extensive margin was driven entirely by the non-tariff factors. Given the total numbers of 6-digit HS products in our sample, the estimated increase of 7-8 percentage points corresponds to roughly 365-418 newly traded products. This is in line with the descriptive numbers from table A2.

Just as with the intensive margin case, the non-tariff trade facilitation as well as the tariff changes appear to have had no impact on the FTA partners at this extensive margin.

It is very interesting to note the impact at the extensive margin of the controls. First, the GSP program has an explicit objective to increase the variety of the products that are exported by the beneficiary countries. However, our results suggest no impact in this regard. Second, for partial scope and free trade agreements, we find economically insignificant magnitudes at the extensive margin. Only customs unions have a robust impact on trade at the extensive margin: they increase the share of lines with positive trade by more than 1% in all specifications (except MFN zero). This again shows the importance of deep trade agreements.

Our findings imply that non-tariff trade facilitation had a strong impact on trade at the extensive margin, and only a moderate impact at the intensive margin. This effect is additional to the general customs unions effect, which we estimate – in line with the prior literature – to be quite large.

5.2. Trade Impact by Processing Stage

Trade policies may affect products differently depending on their processing stage. For example, primary goods may be subject to stringent non-tariff barriers (e.g. due to SPS requirements for agricultural commodities). For final goods, high tariffs may be a more pertinent issue. For intermediate goods, average tariffs as well as technical barriers to trade (TBT) are likely to be lower, analogous to tariff escalation, so the formation of a CU may have a smaller effect. Furthermore, disaggregating our sample further into processing stages helps to better understand which types of goods drive the general results presented above.

TABLE 2
Removal of Customs Controls: Extensive Margin Impact

PPML Model[1]	(1)	(2)	(3)	(4)	(5)
Dependent Variable	Share of Tariff Lines with Positive Trade				
Sample[2]	MFN zero	MFN constant	MFN $\leq$5%	Δ MFN $\leq$5%	All
No Customs Checks $\times$					
CU Partner	0.066*	0.076**	0.073**	0.080***	0.074***
	(2.55)	(2.94)	(3.09)	(3.44)	(3.77)
FTA Partner	-0.009	-0.003	-0.006	-0.004	-0.002
	(-1.47)	(-0.95)	(-1.57)	(-1.13)	(-0.53)
Controls					
GSP	0.001	-0.001	-0.001^{+}	-0.001	-0.001
	(0.72)	(-1.04)	(-1.90)	(-1.54)	(-1.27)
PSA	-2.4e-4	-0.003***	-0.004***	-0.003***	-0.002***
	(-0.21)	(-5.19)	(-5.81)	(-5.18)	(-3.70)
FTA	0.003^{+}	0.003**	0.003**	0.004**	0.003**
	(1.77)	(3.05)	(3.00)	(3.20)	(2.77)
CU	0.002	0.013**	0.011**	0.014**	0.013**
	(0.29)	(3.12)	(2.70)	(3.25)	(3.06)
Underreported[3]	-0.118***	-0.121***	-0.115***	-0.118***	-0.118***
	(-9.39)	(-9.67)	(-9.85)	(-10.28)	(-11.82)
N	121,489	150,951	160,005	170,589	184,933
R-sq	0.9898	0.9925	0.9929	0.9929	0.9893

Notes: +,*, **, *** denote 10, 5, 1, 0.1 per cent significance levels, based on robust standard errors clustered by country-pair-product combinations.
[1] Regression includes importer-exporter-product, import-product-time and exporter-product-time fixed effects.
[2] Column (1) contains products that had zero MFN tariff throughout the sample period in all ECU countries. Column (2) contains products that did not have a change in MFN tariff by more than 1% in the sample period in all ECU countries. Analogously, in column (3) we consider products with low MFN tariffs (less than 5%). Column (4) considers products with tariff changes (not more than 5% increase or decrease). Finally, column (5) contains all products.
[3] See Section 3 for explanation.

We follow the approach of Altomonte et al. (2013) to categorize HS-6 digit products into primary, intermediate and final goods. To do this, we first use a correspondence from HS-6 to the Broad Economic Categories (BEC) classification. We then further reclassify the BEC product categories according to the System of National Accounts (SNA) as primary, intermediate and final goods.[14]

At the intensive margin, the trade increases due to non-tariff trade facilitation strongly depend on the processing stage. For the preferred subsamples of non-tariff impact, presented in columns 3 and 4 of table 3, we estimate a trade increase of more than 60%[15] for primary goods. Impacts on intermediate goods are estimated close to zero and statistically insignificant; for final goods, point estimates point to a moderate positive effect (between 7-11% trade value increase depending on specification), but the statistical significance is not consistent. These findings suggest that the bulk of the trade facilitation impacts we determined above were driven by primary goods. This finding is as expected, since agricultural commodities – an important component of primary goods – are among the most strongly affected by non-tariff barriers. Furthermore, there is mild evidence that FTA partners suffered a reduction in primary goods trade value due to the internal trade facilitation within ECU. The point estimates suggest a 15% decrease of primary goods imports from FTA partners to ECU members due to non-tariff trade facilitation, which is, however, not statistically significant.

In the all–goods sample, the strongest trade promotion effects (more than 50% trade increase) are found for the final goods category (column 5). Since this result is not present in the preferred sub-samples with limited tariff changes, it suggests a degree of trade diversion due to changes in preference margins. There are still large effects for primary goods (above 45% trade increase) and a 10% intermediate goods trade increase. Thus the combined tariff- and non-tariff impacts of ECU consistently increase trade across all-goods group in economically meaningful magnitude, but the welfare analysis of such changes is likely to be more complex as trade diversion may account for some of these increases.

Table 4 presents the corresponding extensive margin results. The dependent variable is the share of product lines with positive trade. The regressions are estimated separately for primary (columns 1-2), intermediate (columns 3-4) and final goods (columns 5-6). Regressions in columns 1, 3 and 5 include only goods of the MFN constant sample, while in columns 2, 4 and 6 - all goods. Throughout the different sub–samples, we obtain consistent and significant results: the share of product lines with positive trade among ECU member states increased by 6.4-9 percentage points.[16] Since the

14. The latter reclassification can be seen in the correspondence table 9A.1 of Altomonte et al. (2013).

15. $e^{0.484} \sim 1.62$

16. Results for other samples (MFN zero, MFN ≤ 5, Δ MFN ≤ 5) are similar and available upon request.

TABLE 3
Removal of Customs Controls: Impact by Value Chain Stage

PPML Model[1]	(1)	(2)	(3)	(4)	(5)
Dependent Variable	Bilateral product-level imports (USD)				
Sample[2]	MFN zero	MFN constant	MFN $\leq$5%	Δ MFN $\leq$5%	All
No Customs Checks × CU Partner ×					
Primary Good	0.081	0.186	0.487*	0.484*	0.398*
	(0.27)	(0.54)	(2.41)	(2.43)	(2.08)
Intermediate Good	0.225	0.103	0.038	0.031	0.100*
	(1.52)	(1.11)	(0.50)	(0.54)	(2.05)
Final Good	0.056	0.005	0.07	0.108*	0.425***
	(0.53)	(0.06)	(0.94)	(2.01)	(7.25)
No Customs Checks × FTA Partner ×					
Primary Good	-0.487	-0.24	-0.158	-0.148	-0.177
	(-1.15)	(-0.99)	(-0.92)	(-0.88)	(-1.07)
Intermediate Good	-0.085	0.016	0.033	0.103	-0.007
	(-0.52)	(0.15)	(0.43)	(1.55)	(-0.12)
Final Good	-0.262*	-0.158+	-0.148+	0.067	0.140***
	(-2.49)	(-1.84)	(-1.95)	(1.40)	(3.55)
Controls					
GSP	0.069	0.059+	0.052	0.053+	0.060+
	(1.41)	(1.85)	(1.40)	(1.67)	(1.72)
PSA	0.003	0.014	0.008	0.006	0.009
	(0.08)	(0.51)	(0.23)	(0.18)	(0.41)
FTA	0.03	0.048*	0.047*	0.051**	0.052**
	(0.76)	(2.04)	(2.35)	(2.90)	(3.23)
CU	0.188+	0.304***	0.312***	0.309***	0.326***
	(1.87)	(4.80)	(5.03)	(5.97)	(6.20)
Underreported[1]	-0.968***	-1.043***	-0.933***	-0.770***	-0.799***
	(-7.68)	(-10.49)	(-8.91)	(-10.22)	(-13.06)
N	4,573,339	14,846,454	21,069,017	34398655	61,043,116
R-sq	0.9952	0.9908	0.9933	0.993	0.9893

Notes: +,*, **, *** denote 10, 5, 1, 0.1 per cent significance levels, based on robust standard errors clustered by country-pair-product combinations.
[1] Regression includes importer-exporter-product, import-product-time and exporter-product-time fixed effects.
[2] Column (1) contains products that had zero MFN tariff throughout the sample period in all ECU countries. Column (2) contains products that did not have a change in MFN tariff by more than 1% in the sample period in all ECU countries. Analogously, in column (3) we consider products with low MFN tariffs (less than 5%). Column (4) considers products with tariff changes (not more than 5% increase or decrease). Finally, column (5) contains all products.
[3] See Section 3 for explanation.

TABLE 4
Removal of Customs Controls: Extensive Margin Impact by Value Chain Stage

Dependent Variable	Share of Tariff Lines with Positive Trade					
PPML Model[1]	(1)	(2)	(3)	(4)	(5)	(6)
Goods	Primary		Intermediate		Final	
Sample[2]	MFN constant	All	MFN constant	All	MFN constant	All
No Customs Checks × CU Partner	0.084*	0.072*	0.072**	0.064**	0.084**	0.090***
	(2.06)	(2.30)	(2.70)	(3.07)	(3.26)	(4.48)
No Customs Checks × FTA Partner	0.001	0.002	-0.004	-0.007*	-0.001	0.005
	(0.20)	(0.96)	(-1.01)	(-2.12)	(-0.17)	(0.88)
Controls						
GSP	0.001	0.001	-0.001	-0.001	0.001	-3.7e-4
	(0.68)	(1.35)	(-0.89)	(-1.03)	(1.00)	(-0.43)
PSA	-0.003***	-0.002***	-0.004***	-0.002***	-0.002+	-0.002**
	(-3.60)	(-4.04)	(-5.39)	(-3.94)	(-1.96)	(-2.78)
FTA	1.2e-4	0.001	0.004***	0.003**	0.003*	0.003*
	(0.11)	(0.67)	(3.38)	(2.84)	(2.09)	(2.26)
CU	0.011*	0.009**	0.015***	0.012**	0.014**	0.017**
	(2.22)	(2.69)	(3.33)	(2.87)	(2.67)	(3.26)
Underreported[3]	-0.130***	-0.136***	-0.127***	-0.121***	-0.107***	-0.112***
	(-7.09)	(-9.31)	(-9.74)	(-11.53)	(-8.34)	(-10.62)
N	79,619	113,441	125,194	158,617	129,867	168,732
R^2	0.9798	0.9865	0.9922	0.9930	0.9892	0.9901

Notes: +,*, **, *** denote 10, 5, 1, 0.1 per cent significance levels, based on robust standard errors clustered by country-pair-product combinations.
[1] Regression includes importer-exporter-product, import-product-time and exporter-product-time fixed effects.
[2] Column (1) contains products that had zero MFN tariff throughout the sample period in all ECU countries. Column (2) contains products that did not have a change in MFN tariff by more than 1% in the sample period in all ECU countries. Analogously, in column (3) we consider products with low MFN tariffs (less than 5%). Column (4) considers products with tariff changes (not more than 5% increase or decrease). Finally, column (5) contains all products.
[3] See Section 3 for explanation.

estimates show almost no variation by tariff change group (MFN constant sample versus all goods), our findings suggest changes in the variety of goods trade were largely unrelated to tariff changes. The difference in coefficients of MFN constant and all goods samples is about 10% of the coefficient magnitudes. For intermediate goods, we find a slightly smaller effect than for the primary and final goods but still economically and statistically significant, which is estimated at around 6.4-7.2 percentage points. As far as FTA partners are concerned, the estimates are close to zero and largely insignificant. It is rather interesting that the non-tariff trade liberalization appears to have similar impact on goods at different processing stages.

5.3. Robustness Tests

We test the robustness of our estimates from table 1 for the all goods sample (column 6) and constant MFN tariff sample (column 2). We choose these two specifications as one presents the total effect combining tariff and non-tariff component, while the other isolates non-tariff border effect by focusing on goods with constant MFN tariffs in all years. We test for robustness in four ways, presented in tables A4 and A5 for all goods and constant MFN samples, respectively.

First, while our main regressions exclude the fuels sector (HS group 27), we run separate regression including this sector, since fuels are an important part of ECU trade. The results, in column 1, indicate no impact of including fuels. This is quite intuitive as the disaggregated gravity estimates are based on within-product variation over time across many products, so the inclusion of few fuel products has no significant impact. Second, we address data limitations related to under-reporting of trade in 2010 (which are discussed in the data section in more detail). In particular, column 2 presents results of a specification without underreporting dummy. Most important, we control in column 3 of A4 whether the ECU effect is different from other customs unions. In the baseline, we use an average CU effect to control for the trade increase of Kazakhstan vis-a-vis Russia and Belarus. In the sample period, we have some EU accessions (Bulgaria, Romania, Croatia), and some enlargements of African CUs. As a robustness test, we allow the coefficient on ECU to be different from average CUs. In this case, the ECU coefficient is different from the border removal effect due to the Kazakhstan-Russia and Kazakhstan-Belarus pairs in 2010, before the removal of customs controls in 2011. Finally, we estimate the model on a sample that ends in 2013 in column 4. This is to avoid possible confounding factors arising from the Ukrainian crisis and the imposition of sanctions on/by Russia (Crozet and Hinz, 2016).

The results are overall similar for the all-goods sample in table A4, with the coefficient of the removal of customs controls somewhat higher in column 2 (0.355 versus 0.302 in table 1). This is expected as underreporting took place for the imports of Kazakhstan from Russia in 2010, before the removal of customs controls. This highlights the need to control for underreporting. Similarly, the estimate in column 3 is also higher at 0.428. Note also that the coefficient for the ECU, although not precisely estimated, has a magnitude similar to the average CU effect. Exclusion of 2014 increases estimates of customs controls removal for both intra-CU trade and trade with FTA partners. Indeed, the deterioration of the relationship between Russia and Ukraine 2014 had a negative impact on trade with Ukraine but also led to temporary customs checks between Belarus and Russia. Overall, robustness results suggest that the baseline estimation strategy likely presents a lower bound of estimated effects for all goods.

Results for the MFN constant sample in table A5 are varying; this does not appear surprising as the no-border coefficient (magnitude 0.122) in the baseline table was not precisely estimated. Including fuels trade reduces the estimated coefficient magnitude, remaining insignificant. Similar to A4, the coefficient in column 2 without underreporting dummy is somewhat higher and precisely estimated. Border removal coefficient is highest in column 3, where the ECU coefficient is estimated much lower than the average CU effect - this could be a result of small product sample. Finally, the sample until 2013 has no strong impact on the estimate - the coefficient, estimated at 0.89, is not significant.

6. Conclusion

This paper studies the trade effects of trade facilitation in the setting of the Eurasian Customs Union. When the Eurasian Customs Union was formed, member states abolished internal customs controls and harmonized external tariffs. We carefully disentangled the tariff and non-tariff effects by exploiting variation between different goods. Indeed, for many products, the external tariff changes caused by ECU were minor or absent, allowing inference on the role of non-tariff factors.

We find that non-tariff trade facilitation has a very large and robust impact on trade at the extensive margin, increasing the share of products traded by 7 to 8 percentage points. These results are intuitive, since trade facilitation has a strong potential to encourage market entry by reducing the fixed cost of exporting. They point to an important mechanism of impact of trade facilitation which, to our knowledge, has so far not received sufficiently close attention. Accounting for stages of processing, we find that for final goods, the extensive margin effect is especially strong.

In contrast, trade effects at the intensive margin appear to be more consistently explained by traditional tariff-driven trade diversion effects. While we do find positive point estimates for the customs removal effect in some intensive margins regressions, the results are not robustly statistically significant. However for the all goods sample, the point estimate for non-tariff trade facilitation is far higher at 0.30 and also statistically significant at the 0.1 percent level. This highlights the importance of accounting for changing preference margins.

Our study contributes to the understanding of the impact of trade facilitation. In a developing economy setting, with member states that score poorly on the World Bank's *Trading Across Borders* index, we find that trade facilitation can contribute to increasing regional trade especially at the extensive margin. This makes it a potentially valuable tool for the diversification of South-South trade flows. In future research, it will be important to track the dynamic aspects of trade facilitation.

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TABLE A1
Descriptive statistics: Import values from world and CU partners.
All products, excluding mineral fuels (HS group 27)

	Belarus		Kazakhstan		Russia	
Annual average	2006-2008	2012-2014	2006-2008	2012-2014	2006-2008	2012-2014
Total imports (bln USD)	19.02	27.88	27.20	40.70	195.83	300.53
Share of intra-CU	40.56%	36.95%	30.45%	33.25%	6.22%	6.87%

TABLE A2
Descriptive statistics: Number of imported product lines, by partner groups.
All products, excluding mineral fuels (HS group 27)

	Belarus		Kazakhstan		Russia	
Annual average	2006-2008	2012-2014	2006-2008	2012-2014	2006-2008	2012-2014
Intra-CU	3,907.7	4,123.3	3,442	4,283.7	3,042.7	3,563.7
FTA	1,774	1,827	1,752	1,711.7	2,527	2,495.7
MFN	4,169.3	4,111.3	4,306.7	4,221	4,674	4,623.3

TABLE A3
Number of product lines by processing stage and tariff samples

	MFN zero	MFN constant	MFN <= 5%	Δ MFN<=5%	All goods
All goods	302	1650	2022	3243	5223
Primary	15	157	241	291	391
Intermediate	73	1075	1281	1980	2863
Final	213	410	497	962	1947

TABLE A4
Removal of Customs Controls: Robustness Checks

PPML Model[1]	(1)	(2)	(3)	(4)
Dependent Variable	Bilateral product-level imports (USD)			
Sample	All goods			
Specification[2]	Include Fuels	All	All	No 2014
No Customs Checks ×				
CU partner	0.302***	0.355***	0.428*	0.549***
	(4.40)	(6.08)	(2.46)	(9.96)
FTA partner	0.146*	0.057	0.069	0.095*
	(2.20)	(1.32)	(1.58)	(2.23)
Controls				
GSP	0.074	0.062+	0.078*	0.064+
	(1.55)	(1.79)	(2.22)	(1.83)
PSA	-0.010	0.005	-0.014	0.002
	(-0.33)	(0.24)	(-0.61)	(0.08)
FTA	0.051**	0.054***	0.050**	0.048**
	(2.58)	(3.32)	(3.12)	(3.09)
CU	0.328***	0.285***	0.331***	0.317***
	(4.29)	(5.04)	(5.99)	(5.85)
ECU			0.263	
			(1.48)	
Underreported[3]	-0.770***		-0.641***	-0.494***
	(-9.69)		(-3.51)	(-8.77)
N	61,455,804	61,189,988	61,189,988	54,268,459
R-sq	0.9832	0.9863	0.9863	0.9863

Notes: +,*, **, *** denote 10, 5, 1, 0.1 per cent significance levels, based on robust standard errors clustered by country-pair-product combinations.
[1] Regression includes importer-exporter-product, import-product-time and exporter-product-time fixed effects.
[2] Column (1) includes trade in fuels (HS chapter 27). Column (4) includes sample only until 2013.
[3] See Section 3 for explanation.

TABLE A5
Removal of Customs Controls: Robustness Checks

PPML Model[1]	(1)	(2)	(3)	(4)
Dependent Variable	Bilateral product-level imports (USD)			
Sample	MFN constant			
Specification[2]	Include Fuels	All	All	No 2014
No Customs Checks ×				
CU partner	0.051	0.156*	0.350**	0.089
	(0.25)	(2.06)	(2.70)	(1.00)
FTA partner	0.228	-0.070	-0.038	-0.047
	(1.24)	(-0.98)	(-0.47)	(-0.65)
Controls				
GSP	0.077	0.057+	0.067*	0.058+
	(1.37)	(1.80)	(2.11)	(1.72)
PSA	-0.027	0.023	-0.007	0.006
	(-0.64)	(0.81)	(-0.23)	(0.22)
FTA	0.043	0.049*	0.048*	0.043+
	(1.52)	(2.09)	(2.06)	(1.95)
CU	0.307	0.252**	0.311***	0.289***
	(1.19)	(3.29)	(4.55)	(4.64)
ECU			0.133	
			(0.96)	
Underreported[3]	-1.105***		-0.778***	-1.025***
	(-4.71)		(-5.35)	(-10.17)
N	15,093,178	14,884,630	14,884,630	13,189,994
R-sq	0.9811	0.9908	0.9908	0.9912

Notes: +,*, **, *** denote 10, 5, 1, 0.1 per cent significance levels, based on robust standard errors clustered by country-pair-product combinations.
[1] Regression includes importer-exporter-product, import-product-time and exporter-product-time fixed effects.
[2] Column (1) includes trade in fuels (HS chapter 27). Column (4) includes sample only until 2013.
[3] See Section 3 for explanation.