

## Export costs of visa restrictions

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### Abstract

The paper studies the role visa restrictions play in determining export flows between firms and their foreign partners and explores the mechanism of this relationship. The specification of empirical model is derived from a heterogeneous firms' model of trade. The existing visa restrictions are used as proxies for the costs the exporters incur while dealing with customers abroad. Data on trade flows and parties involved comes from customs transaction database. The results indicate that visas have a negative market access effect. Controlling for the choice of destination, visas have a significant negative effect on the value of relationship-specific exports as well. These results are consistent with informational and contractual nature of visa costs.

Key words: heterogeneous firms, exports, visa restrictions, market access costs, extensive and intensive margins of trade

JEL codes: F14, F42, F55

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## **1. Introduction**

Policy decisions in the area of foreign relations influence economic relations between countries. Quantifying these effects is usually next to impossible and decision making is, as a result, often based on very limited grounds and driven by qualitative intuition and strong political preferences. However, these decisions might have very important redistribution effects and might be underestimated as an instrument of discriminatory trade policy. This paper provides an example of a quantitative approach to assessment of the effect of policy instruments in the area of foreign affairs on the economic outcomes. Specifically, we study the effect of visa restrictions between countries on bilateral trade flows. The recent developments in trade theory and empirical research allow for specification of structural relations between country-level bilateral costs of trade and decision making about exporting by individual firms. We proxy these costs with visa restrictions and use heterogeneity in firms' decisions with respect to export and destinations to estimate the effect of visas on market access and trade flows.

The heterogeneous firms approach proposed by Melitz (Melitz, 2003) to the modeling of international trade reveals an important role that fixed costs of exporting play in shaping patterns of exports. The literature distinguishes between fixed and variable costs of exporting, but the empirical evidence on cost composition is very limited and particularly little is known about the fixed costs of exporting. In this paper we test whether visa restrictions, which we consider as proxies to fixed and variable costs of exporting, are significant impediments for firms' exports. The mechanism we are considering builds on empirical observations that when a pair of countries has visa restrictions, both bilateral and unilateral, their bilateral trade flows and tourist exchanges are smaller compared to pairs of countries without these restrictions (Neumayer, 2011). While the effect on tourist flows is easily explained by the additional hurdle, the effect on exports is less obvious. If the costs of visa restrictions are derived solely from the monetary costs of obtaining a

visa, then given the relatively negligible size of these costs compared to the price of a potential or already signed contract, we should not observe the effect of visa restrictions on trade flows.

However, anecdotal evidence and our own rich experience with visa applications indicate that there are other relevant costs involved in obtaining a visa beyond the simple monetary cost associated with the visa fee. There is always a risk that the application for visa will be refused or a visa stamp will be obtained later than necessary for visiting purposes. Conference organizers in any part of the world that has many visa restrictions face the risks of presentation cancellations at the last moment due to the inability of speakers to obtain their visa in time. The important question is whether these risks, and the costs they impose, have a real effect on trade links between countries and, second, how large the effect is. Our hypothesis is that if those risks are important for trade then we should observe a differentiated effect of visa restrictions on the trade flows depending on the contractual nature of the traded good in question. Export contracts that require fewer personal contacts for their enforcement should be less sensitive to risks associated with the inability of partners to communicate in person. If this is the case, then we should estimate smaller costs of market access for non-relationship specific goods compared to relationship specific goods.

We examine our hypothesis by testing whether Russian firms export less to countries which impose strict visa restrictions compared to countries with mild or visa free policies, other things being equal. We test these effects separately for trade in goods for which relationship-specific investments are important and trade in goods that require them less. We estimate the effects of visa restrictions both on extensive and intensive margin of trade. Given the structure of data we measure the extensive margin of trade with a firms' choice of export destinations and intensive margin with a value of a firms' export to chosen destinations.

The export data we employ are quite detailed and specify the firm, good, destination, partner firm and value of each export transaction through Russian customs. The panel structure of

data along with the diversity of export destinations chosen by each firm allows us to control for unobservable time-varying firms' characteristics. We limit our sample to manufacturing goods only. Further, the contractual nature of the goods exported by Russian firms is measured by the Rauch index (Rauch, 1999).

We link Russian firms' export transaction data with data on visa restrictions for 180 other countries over a period of eight years from 2003 to 2010. Unlike many other countries in the world, the Russian Ministry of Foreign Relations has been actively engaged in bilateral negotiations aimed at abolishing visa restrictions during the last decade. During the time period in question, there were 35 changes in visa regimes. However, the countries with which Russia managed to work out these changes so far play a very small role in terms of export destinations for Russian firms. This does not allow us to apply a destination fixed effect approach to study the effect of visas in dynamics. To overcome this problem we control for typical country level characteristics beyond visa restrictions.

The obvious concern is the endogeneity of the policy variable with economic performance. Namely, we might expect that policy makers place more efforts in negotiating the abolishment of visa restrictions with those countries that play greater role as export destinations for domestic firms. To address this concern, we might consider, first, the reciprocity principle of Russian foreign policy<sup>2</sup>. In the case of visa restrictions it means that Russia has a similar policy with respect to the citizens of another country as that country has with respect to Russian citizens. This would mean that visa waivers occur only for citizens of a country that also provides visa waivers for Russian citizens in return. Given reciprocity principle, we might expect opposite interests of destination country with respect to a visa waiver for Russian citizens if there is an endogeneity of the visa regime to export flows. In this case, the potential endogeneity might be subject to potential opposition from the destination country's foreign policy preferences. Since

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<sup>2</sup> Federal Migration Service: procedure of issuing Russian visas page  
[http://www.fms.gov.ru/documents/viza/index\\_eng.php](http://www.fms.gov.ru/documents/viza/index_eng.php)

unilateral visa restrictions contradict the reciprocity principle of Russia, the endogeneity of visas is unlikely.

Nevertheless, we propose also an instrumental approach to deal with potential endogeneity. We use bilateral tourist flows as an instrument for the visa variable. Our assumptions are that while the visa regime is correlated with the importance of tourism with the destination country, the export flows of manufacturing goods is not. The supporting evidence in favor of the first assumption might be the seasonal waivers of visa restrictions for many important tourist destinations for citizens of an otherwise normally visa restricted country. Unlike import flows, which might be less welcome by policy makers, tourists are considered as an important source of income for the hospitality industry.

Our results indicate that visas have a strong negative effect on market access which is twice as high for export of relation-specific goods as for export of non-relation specific goods. Controlling for the choice of destination, visas have a significant negative effect on the value of exports of relation-specific goods as well. These results are consistent with the contractual nature of visa costs.

The policy implications of this analysis may be very important. It demonstrates that visa regimes play a role as a non-tariff restriction or barrier and can have a significant effect on the development of trade relations between countries. The losses in trade due to visa restrictions are both extensive and intensive. In addition, visas contribute to a bias in trade flows toward non-relation specific goods. Given the substantial negative effects of visas on trade relations, it is questionable whether many of the existing visa restrictions are beneficial for the countries.

This paper is divided into five sections. The next section outlines the theoretical background for the model we use. Section three describes the data and explains in detail the construction of the variables we use for examining the relationships between export and visa regimes. Section four presents the estimates and, finally, section five concludes.

## 2. Theoretical framework for empirical model

In our study we apply an approach suggested in Helpman, Melitz and Rubinstein (Helpman et al, 2008) in which the authors derived a gravity equation for a Melitz type of heterogeneous model in international trade. Their model of selection into trade has dominated recent literature in this field as most of the recent research has been elaborating on it.

Let's consider  $J+1$  trading countries,  $j=0,1,2,\dots,J$ . In each country there is a representative consumer with CES preferences:

$$u_j = \left[ \int_{l \in B_j} x_j(l)^\alpha dl \right]^{\frac{1}{\alpha}}, 0 < \alpha < 1, \epsilon = 1/(1 - \alpha).$$

with an elasticity of substitution  $\epsilon$  being the same in all countries.

$Y_j$  denotes the revenue of country  $j$ . Then the demand for good  $l$  by country  $j$  is

$$x_j(l) = \frac{\hat{p}_j(l)^{-\epsilon} Y_j}{P_j^{1-\epsilon}}$$

where  $\hat{p}_j(l)$  - price of good  $l$  in country  $j$ .

the price index in country  $j$  follows as:  $P_j = \left[ \int_{l \in B_j} \hat{p}_j(l)^{1-\epsilon} dl \right]^{\frac{1}{(1-\epsilon)}}$ .

On supply side there are heterogeneous firms in each country which produce differentiated goods. Within a country, firms differ in the per unit cost of production,  $a$ , measured in terms of a bundle of factors. The price of a bundle of factors in country  $j$  is  $c_j$ . The costs of production per unit is distributed over the interval  $a_L, a_H$  ( $a_H > a_L > 0$ ), according to the distribution function  $G(a)$ , which is the same in all countries.

In order to sell the goods in market  $i$  firms from country  $j$  face the market access fixed costs  $c_j f_{ij}$ , where  $f_{jj}=0$  for any  $j$ ,  $f_{ij}>0$ ,  $i \neq j$ , and iceberg variable costs  $\tau_{ij}$ ,  $\tau_{jj}=1$  for any  $j$ ,  $\tau_{ij}>1$ ,  $i \neq j$

Each firm produces one type of differentiated good under monopolistic competition. Given demand, the price of good  $l$  on domestic market is  $p_j(l) = c_j a / \alpha$  and the price of good  $l$  on market  $i$  is  $p_{ij}(l) = \tau_{ij} c_j a / \alpha$

Operating profit from market  $i$  sales is  $\pi_{ij}(a) = (1 - \alpha) \left( \frac{\tau_{ij} c_j a}{\alpha} \right)^{1-\epsilon} Y_i - c_j f_{ij}$ .

If  $i=j$ , then operating profit  $>0$ , and all firms serve domestic markets.

If  $i \neq j$  - only firms with  $a \leq a_{ij}$  serve market  $i$  where  $a_{ij}$  is defined by the zero profit condition for the marginal exporter  $\pi_{ij}(a_{ij}) = 0$  which implies the equation for the cut-off level of per unit production costs

$$(1 - \alpha) \left( \frac{\tau_{ij} c_j a_{ij}}{\alpha} \right)^{1-\epsilon} Y_i = c_j f_{ij}$$

Consider firms in country  $j=0$  at year  $t$ .

Firm  $h$  exports to destination  $d$  at year  $t$  if  $a_t^h < a_{dt}$ , where  $(1 - \alpha) \left( \frac{\tau_{dt} c_t a_{dt}}{\alpha P_{dt}} \right)^{1-\epsilon} Y_{dt} = c_t f_{dt}$

If firm  $h$  exports then

$$\text{Volume of Export}_{dt}^h = (1 - \alpha) \left( \frac{\tau_{dt} c_t a_t^h}{\alpha P_{dt}} \right)^{1-\epsilon} Y_{dt}$$

$$\text{Value of Export}_{dt}^h = (1 - \alpha) \left( \frac{\tau_{dt} c_t a_t^h}{\alpha} \right)^{2-\epsilon} \left( \frac{1}{P_{dt}} \right)^{1-\epsilon} Y_{dt}$$

Taking logarithms, we obtain the following empirical specifications:

The selection into exporters for each destination  $d$

$$\text{Probability of export}_{dt}^h = \alpha + \beta_1 * VCE_{dt} + \beta_2 * FCE_{dt} + \gamma GDP_{dt} + \lambda_t^h + \epsilon_{dt}^h \quad (1)$$

where  $\text{Probability of export}_{dt}^h$  denotes the binary indicator for firm  $h$  in year  $t$  exporting to the country  $d$ ,  $VCE_{htd}$  are variable costs of exporting,  $FCE_{htd}$  are fixed costs of market access,  $GDP_{td}$  is the log of GDP of the destination country, and the last term is a fixed effect on firms in each year.

And if there is an export of firm  $h$  to market  $d$ , then

$$\text{Value of Export}_{dt}^h = \alpha + \beta * VCE_{dt} + \gamma GDP_{dt} + \lambda_t^h + u_{dt}^h \quad (2)$$

where  $\text{Value of Export}_{dt}^h$  is the log of export value of firm  $h$  at time  $t$  to country  $d$ .

These two specifications can also be used to distinguish between the fixed and variable costs of exporting. Namely, while the components of variable costs of exporting have a detrimental effect on both probability of exporting and the value of an export, the components of fixed costs of exporting contribute only to the decline of probability of exporting to the destination and do not affect the value of exporting.

Exporting firms face entry costs in addition to the regular costs of delivering a good to a foreign market. In addition to production and transportation costs, other costs are involved in exporting such as business trip expenses, foreign market research, trade representative, customer support, maintenance expenses and others which are specific for a firm. All these costs are part of the fixed or variable costs of exporting, which induce the model's partitioning condition discussed earlier. If the foreign country has strict visa regulations with the domestic country of the firm, monetary and time expenses should increase. This means a rise in fixed or variable costs, or both. To see exactly how visa restrictions can affect the decision of a firm to export or not, and how much to export, consider a case of a Russian medium size enterprise which makes a decision



about selling its products in a foreign market. Data from one such enterprise reveals that the direct costs of starting to export in Russia totals \$16 200 per month per foreign destination. These costs usually include expenses on a thorough study of foreign markets ( 9%), the study of foreign country legislation (10%), hiring logistics and customs clearance specialists (9%), providing financial and insurance guarantees (12%), finding a trade representative abroad (12%), sponsoring customer support abroad (12%), business trip expenses (30%), and hiring a translator (6%). Some investments are country and good specific, such as customer support expenses, trade representative and marketing specialist salaries; others may be generalized for all markets. Travel expenses, which include visa costs as well, constitute 30% of direct costs. In this case, it takes at least 9 months for a Russian small or medium enterprise to become profitable given a rather high level of profitability of doing business abroad.<sup>3</sup>

Visa restrictions account for some portion of travel costs, which is also a significant part of sunk exporting costs. This case supports the idea that the cost advantage of countries without restrictions makes these markets more attractive to Russian firms. As a result, a visa regime is an important factor of trade as it affects the fixed costs of exporting.

In our study we use several destination specific parameters as proxies of costs of exporting to the destination. Based on estimation results we can infer what type of costs the particular variable contributes to. Those variables are distance, former Soviet Union republic, tariffs, WTO membership, no access to sea at the destination and having a common border with Russia.

Before moving to the estimation results, we describe the data we are going to use, their sources and the detailed construction of the specific variables used.

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<sup>3</sup> Presentation at the meeting of the working group on developing the road map for reducing the costs of exporting for Russian firms, Agency of Strategic Initiatives, March 2012.

### 3. Data

#### Dependent variables

We created several measures for bilateral trade flows. Data on exporters and the volume of trade comes from the Russian Customs Transaction Database<sup>4</sup>. The database contains records of Russian export transactions of goods for the period from January 2003 to the end of December 2010. For most of transactions we have a unique tax identification number of the exporter (INN), 10-digit OKVED<sup>5</sup> code of the good subject to export by this firm, the statistical value of the good, and the destination country. These data include transactions between Russian exporters and customers in 180 countries. The list of these countries is provided in Table A1 of the Appendix.

The data covers 8 years of transactions, but not all firms which exported in 2003 continued to export in subsequent years. In total we have 14184 unique Russian exporters, 48% of which exported only in one year over the period 2003-2010. Another 20% of firms in our sample exported in any two years over this period. Figure 1 illustrates the survival of exporters in our sample.

Goods are classified based on their 10-digit OKVED codes where the first 6 digits correspond to HS 1996 (H1) codes. After truncating the goods' codes, we use (Rauch 1999) classification to distinguish between reference priced and relationship specific goods. If the good is sold on an exchange, then the market for the input is thick with many alternative buyers and sellers. The market of such a good has specialized traders that centralize price information and so the value of the good is given for the seller and the buyer and will be less influenced by the relationship between them. By definition, such a good is not relationship-specific (NRS) or "transaction-specific" as used in (Williamson 1979). If the good is not sold on an exchange, it

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<sup>4</sup> The data were purchased from Neostatis Center of Strategic Information <http://www.neostatis.ru/>

<sup>5</sup> OKVED stands for Russian national product classification. It consists of 10 digits, the first 6 corresponding to 6-digit HS code.

may be reference priced or the one that requires special matching of the buyer and seller as the observed price may be different in any other place after adjusting for several characteristics of the good. Rauch refers to such goods as differentiated goods. In the last two cases, sellers and buyers are engaged in search of each other where matching is harder in the case of a differentiated good. For our purpose it is important that this search is facilitated by the proximity of countries, cultures, languages, contacts and absence of visa restrictions as well. Thus, selling a differentiated good requires extensive knowledge of the market, and selling reference priced good requires a lesser effort by the seller. We label all goods that are not traded on an exchange as relationship-specific (RS). Rauch has both a liberal estimate and a conservative estimate. Throughout this paper, we use the liberal estimate. None of the results are affected by this decision and therefore the label appears to be robust for our purposes.

For each firm for every year and for every destination we construct the value of the overall export flow, the value of the export of relation specific goods and the value of the export of non-relation specific goods.

### **Independent variables**

#### *Visas*

We collected data on all bilateral visa constraints for the period 2003-2010 between Russia and all foreign export destinations. During this period Russia managed to negotiate visa restriction abolishment with a number of countries in various geographical regions. More specifically there are 35 countries that changed their visa rules with Russia significantly. Today Russian citizen can visit 55 out of 180 countries in our sample of export destinations without visa hurdle. The source of information concerning the visa regime is web site of the Ministry of Foreign Affairs of the

Russian Federation<sup>6</sup>, where the main agreements on visa changes are officially posted. The visa constraints and the year of their changes are presented in table A1 of the Appendix.

Visa restrictions are imposed by governments to control the inbound travel of non-citizens. They may be an expression of relationships between countries and are a reflection of the history of relations. For the general public, as well as businesspeople, visas are usually granted on the basis of citizenship. To receive a visa with the purpose to enter a country, people usually have to spend their money and time at a foreign Consulate. However, according to the rules, a visa stamp in your passport may not guarantee that you will be permitted to enter the country when you arrive at a point of entry. The good news is that there is a high probability that you will be able to enter. This means, however, that legal visa restrictions may impose extra costs on business during negotiations with foreign partners and may also restrict the exchange of information, reputation building and business expansion outside the home country.

An important question is why visa regimes change. The answer to this question is critical for the validity of our results. If the visa change is the result of increased trade, then we have severe reverse causality problem in our study. However, there may be a number of reasons for change such as economic, political or technical. Economic relations between two countries are often taken into account when the decision about visa regimes is made. One recent example of this is Russia's WTO accession which intensified the discussions about visa regime simplification between the US and Russia and the EU and Russia. So far, however, there is no record in the recent history of Russian international relations that confirms our argument that the visa regime changed due to increased trade flows, so although this is a theoretical possibility, it is unlikely that causality runs in this direction in this specific case.

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<sup>6</sup> <http://www.mid.ru/>

Further, there are several types of visa regimes<sup>7</sup>. In this study we construct an indicator variable which is equal to 1 if there is visa constraint between two countries and 0 if not. The approach we apply is summarized in table 1.

If visa needs to be arranged in advance and any amount of money must be paid for it along with collecting the documents, we treat this regime as '1' in all classifications. We also treat the absence of visa restrictions as '0' everywhere. When a visa can be purchased at the airport, the expenses can still be large as the cost actually may vary from \$20 to \$200. If the visa can be obtained for free at the border, it still requires presenting required documents and proof of stay to officials, which may be time consuming and involve risk of rejection; all of which are, in effect, costs associated with a visa regime despite a formal fee of zero. Usually the restrictions on the length of stay vary from 15 days to 90 days, but we do not account for these differences here.

Visa regimes have some variation across years, but most of the variation takes place between destinations. This means that in a large number of cases we have either zero or one for the entire period covering 2003 to 2010. Whenever a change took place, it was usually about visa abolishment except to Romania in 2003 as a result of its joining the EU and Costa Rica which switched to visa requirements in 2008 and is planning to switch back in 2012.

### *Tariffs*

We use tariffs as a measure of the variable costs of an export. The tariff data were collected from the WITS Database which contains data in four duty types: MFN applied tariffs, bound tariffs, effectively applied tariffs and preferential tariffs. It has numerous missing values and not all goods and countries are covered. We use Effectively Applied tariff and supplement this information by the data from World Tariff Profile, which seems to compensate for the missing values in effectively applied tariffs from the WITS database. They are not exactly the

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<sup>7</sup> We intentionally restrict the analysis to tourist or business visas (they are similar restrictions most of the time), as they are a natural choice of businessman who wants to make relations with a foreign partner. There are also special group of citizens with diplomatic and official international passports – we do not consider them for obvious reasons.

same tariffs by construction, but about 30% of the tariff data between these two datasets match well. The final measure of tariffs we use is the log of the effectively applied tariff from WITS adjusted with the log of the applied tariff's simple average from World Tariff Profile when the first is missing. Tariff data are at the 6-digit HS product level. For each trade flow at firm-destination-year level, we constructed a weighted average applied tariff based on the weights of the export basket of the firm to this destination.

### *Instrumenting visa variable*

Endogeneity of a visa variable is an obvious concern. Politicians might facilitate visa negotiations if the country's economic interests expand toward some destination. It might affect visa abolishment between countries, for example. To deal with this issue we use an instrument approach.

As an instrument for visa restrictions we use tourist flows between countries. We argue that visa regimes are sensitive to an increase in tourist inflow in the country. Many tourist oriented countries often apply seasonal abolishment of visa requirements to increase the number of arriving tourists (it is a direct equivalent of an export of services rather than of a good).

However, a good instrument should also not be correlated with the dependent variable. While export flows and tourist flows are driven by very different causes, statistically they might be correlated across destinations because of a similar impact of other exogenous country characteristics between two states. Neumayer (2011) showed that both bilateral trade and tourist flows are well described by a gravity model. We might, therefore, expect that proximity of a destination might have similar effects on both trade and tourist flows which could result in a correlation between them. To ensure independence between the instrument and export flows we constructed artificial trade flows. Based on the world-wide flows of tourists we built a ranking of destination countries by their attractiveness to tourists as a share of overall world tourists in 2010

that visited the country<sup>8</sup>. Then we multiply this share by the total number of outbound tourists from Russia in each year. Both properties of good instrument are satisfied in our case. On the one hand, the instrument is correlated with the visa variable and, on the other hand, it is not correlated with export flows of individual firms.

### *Tourist flows*

Data on the number of outbound Russian tourists and worldwide tourist flows are taken from the World Tourism Organization<sup>9</sup> and cover the period from 2003 to 2010. To deal with possible correlation between tourist outflow and exports we constructed an artificial measure of tourist flows. First, we created a ranking of all destinations based on their attractiveness to tourists in the whole world. This ranking is a share of tourists in the whole world that visited the country in 2009. Then the flow of Russian tourists to each destination was proxied by the product of all outbound tourists from Russia in each year with the ranking of the destination by worldwide attractiveness for tourists.

### *Proxies for costs*

We used traditional gravity variables to control for the factors that facilitate or impede trade: GDP, indicator variable for former Soviet Union republics, distance, contiguity and landlocked destinations. Importer size (or market size) is measured as log of GDP PPP from the World Bank database<sup>10</sup>. This source does not cover all countries and years in our sample: for 11 countries some years have missing data and for 8 countries all data about GDP are missing. So the inclusion of this control reduces the sample of destinations to 161 countries. Other gravity controls, such as official common language, distance, contiguity, landlocked or not come from the

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<sup>8</sup> The source of data is UNWTO Tourist Highlights. 2012 Edition

<sup>9</sup> We are grateful to World Tourism Organization for their kind provision of the data over the period 2002-2010.

<sup>10</sup> <http://databank.worldbank.org/data/home.aspx>

database of CEPII<sup>11</sup>. Variable trade costs are proxied by distance and tariff rates at destination. We also add a FSU (Former Soviet Union) dummy specifically for Russia as it might have a significant impact on trade due to historical relations.

WTO membership is considered to be an important gravity control in the literature (Helpman et al., 2008), so we also included it into our set of controls. Data on WTO membership and its effective date was taken from official web site of the organization<sup>12</sup>.

Table A2 in the Appendix presents the summary statistics for all measures of trade as well as for other variables used in this study.

#### **4. Results**

Our dataset for selection specification has 3 732 613 observations of firm-country-year triplets. The dataset for value specification consists of fewer observations on the second stage of instrumented regression since we keep only active exporters. The number of observations in the latter case depends on the type of margin.

Our empirical strategy is to use two-stage least squares approach with weighing in the second step to eliminate the potential bias due to selection into exporters to particular destination. In tables 2-4 we use inverse probability weighting estimator (IPW) obtained from estimates of corresponding selection equation (1) and averaged across firm-year pairs. This corrects the distribution of observation with positive flows only for potential bias. Imbens and Wooldridge (2009) consider this approach among others applicable to correct for selection bias.

We start with estimation of selection equation. Results of conditional logit estimations are reported in table 2. Unlike regular logistic regression the data are grouped at firm-year dimension and the likelihood is calculated relative to each group. This approach is especially suitable for models of choice behavior, where the set of explanatory variables may include both the controls

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<sup>11</sup> <http://www.cepii.fr/anglaisgraph/bdd/gravity.asp>

<sup>12</sup> [http://www.wto.org/english/thewto\\_e/whatis\\_e/tif\\_e/org6\\_e.htm](http://www.wto.org/english/thewto_e/whatis_e/tif_e/org6_e.htm)



of the choice alternatives and controls of the agents making the choices. This is exactly the setup of our selection model (1), where both firms' characteristics and destination attributes define the probability for the firm to choose particular export destination.

In table 2 we present the results for one of the possible definitions of visa dummies but the results are quite robust to variations as well. The estimations indicate that the probability of the firm to export to visa-restricted destinations is below the probability of export to visa-free destinations. The probability gap is estimated to be about 36 percent for the overall sample, 40% for relationship specific transactions only and 26% for non-relationship specific export. These results emphasize the economic importance of visa restrictions.

Table 3 shows the results of estimates for equations 1 and 2 for the full sample of firms and their exports using ordinary least square methods. Columns (1) and (3) show the first stage estimations of instrumental regressions. Both indicate a good fit in terms of the instrument, the coefficient on tourists has high t-statistics. The negative sign of the coefficient means that bigger flows of Russian tourists are a good predictor of visa free regime with Russia all else being equal. To control for selection bias in columns (3) and (4) for each observation with a positive export flow, we use inverse probability weighting estimator. OLS results are consistent with the conditional logit reported in table 2 and indicate that visa restrictions do have a negative selection effect and controlling for destination have negative effect on export flows. The lower bound of the confidence interval suggests that the export values are lower by at least 18% to visa restricted destinations compared to visa free ones.

Table 4 shows the results of estimates of equations (1) and (2) for the subsample of exports for relation specific goods. Again, columns (1) and (3) indicate a good fit for the instrument. Results of the weighted regressions are in columns (3) and (4). The effect of visas onto the probability of exporting of relation specific goods is negative. However the visa effect on the export value of such goods is large: the lower bound of the confidence interval suggests that

the export values are lower by at least 50% to visa restricted destinations compared to visa free ones.

Table 5 shows the results of estimates of equations (1) and (2) for the subsample of non-relationship specific goods. Again, columns (3) and (4) show the results of weighted regressions. The effect of visas on selection into exporters of non-relationship specific goods is significant and negative. However after controlling for the choice of destination, visas have no significant effect on export value of non-relationship specific goods.

The results reported in all three tables unambiguously indicate that visa restrictions are a significant and negative factor for market access. Russian firms export less often to visa restricted destinations than to visa free destinations. This hypothesis is confirmed across the whole sample and two subsamples – export of relation specific and non-relation specific goods.

At the same time, we find that controlling for the choice to export, visa restrictions still have a negative significant effect on the value of exports for relation specific goods while not differentiating the value of export of non-relation specific goods across destinations with different visa restrictions.

These results are consistent with the assumption that visa restrictions do, in fact, contribute to the costs of market access. However, the negative effect of visa restrictions on the value of exports of relationship specific goods indicates that it might be also a component of variable costs. Given the nature of visa application procedures we can assume that it is the risks associated with contract enforcement that makes visa costs a part of the variable costs of export. The lack of a significant effect of visa restrictions on the value of export of non-relationship specific goods supports this assumption.

Besides the estimated role of visa restrictions for the choice of destinations, results reported in tables 2-5 provide several important insights.

1. Results in table 2 and columns 2 in tables 3-5 unambiguously emphasize the role of distance in the choice of export destinations. Firms export to nearby destinations more often than to farther destinations. However, as indicated by results in column (4) in tables 3-5, controlling for the choice of destination the distance has no effect on the value of export. This result remains robust for all three samples. This result may be very important for the understanding of the nature of trade costs. Distance related trade costs usually are regarded as a part of variable export costs. Our results indicate that in modern world it may not be the case anymore. Information related costs of distance may be the most important one and in this respect they have strong destination selection effect and no value effect.

2. According to results presented in tables 3-5 the tariff rate at destination increases the costs of market access in this destination while having a positive effect on the value of export of relationship specific goods and having no significant effect on the export of non-relationship specific goods. The results of conditional logit estimations confirm the negative selection effect for the export of relationship specific goods only. The positive value effect might be interpreted as evidence about the size of the elasticity of substitution in the demand for Russian export goods. In the case of relationship specific goods, we can assume that the elasticity is between 1 and 2. This interval for the elasticity of substitution for differentiated goods is also found in many other estimates of the elasticity of substitution in CES utility functions.

3. Consistent and intuitive results are obtained for the Former Soviet Union dummy. Namely, while there is an easier access for Russian exporters to markets of former Soviet Union republics it does not have any effect on the value of export. These results are also consistent with the information-driven nature of foreign market access costs.

## **5. Conclusions**

This study of the effect of visa restrictions on firms' export provides evidence consistent with the assumption that visa restrictions contribute to market access costs. Russian firms choose export destinations with visa requirements less often compared to similar destinations without visa requirements. Controlling for bias introduced by the choice of export destination we find that visa restrictions have a detrimental effect on the value of exports for relationship specific goods and do not have any effect on the value of exports for non-relationship specific goods. We find that both the sign and size of effects are consistent with the assumption that visa restrictions increase the information costs and costs of contract enforcement.

These results confirm our concern that pure policy instruments can have a strong discriminatory effect while being beyond the scope of regular trade negotiations and multilateral trade talks. The results also emphasize the significant distributional effect of the state of political relations between countries on industries inside national borders. Given that the bilateral distribution of visa restrictions across the world has a strong South-North flavor, namely, developed countries more likely having visa restrictions with respect to citizens from developing countries than from developed countries, visa restrictions can contribute to a development bias in less fortunate countries toward non-relationship specific goods which are also usually less technically advanced.

It follows that export promotion policies in developing countries should take into account these effects and intensify the efforts channeled toward visa waiver negotiations and partially address the problem by promoting less cumbersome procedures for visa applications for business people.



**Figure 1 Duration of exporting in the sample**

**Table 1 Definition of visa restriction dummies**

<p><i>Official and diplomatic passports</i></p>	<p><i>All other international passports</i></p>			
<p>---</p>	<p><b>1. Visa is required</b></p>			<p><b>2. Visa is not required</b></p>
<p>---</p>	<p><b>1.a</b> Obtaining a visa takes some time and money and it should be arranged beforehand</p>	<p><b>1.b</b> Visa can be obtained at the border for a fee</p>	<p><b>1. c</b> Visa can be obtained at the border for free</p>	<p>---</p>

**Table 2 Conditional logit estimates of selection equation (1)**

VARIABLES	(1) ALL	(2) RS	(3) NRS
Visa = 1 for 1.a, 1.b	-0.360*** (0.021)	-0.402*** (0.024)	-0.259*** (0.039)
Tariff rate (log)	0.001 (0.008)	0.019** (0.009)	-0.012 (0.017)
WTO dummy	-0.009 (0.023)	0.075*** (0.027)	-0.154*** (0.042)
GDP PPP (log)	0.657*** (0.007)	0.647*** (0.008)	0.644*** (0.012)
Former Soviet Union Dummy	2.447*** (0.042)	2.613*** (0.050)	1.794*** (0.072)
Landlocked	0.936*** (0.025)	1.018*** (0.027)	0.779*** (0.052)
Dummy for contiguity	0.463*** (0.027)	0.574*** (0.031)	0.311*** (0.058)
Distance (log)	-0.715*** (0.022)	-0.632*** (0.024)	-0.890*** (0.041)
Observations	2,776,376	2,349,629	648,125
Firm-Year FE	YES	YES	YES
Cluster	YES	YES	YES

Robust standard errors in parentheses, clustered at firm level

\*\*\* p<0.01, \*\* p<0.05, \* p<0.1

Column (1) reports estimation results for full sample, column (2) for the subset of relationship specific export, and column (3) for non-relationship specific transactions.

**Table 3. Estimates on the total sample of exports.**

Dependent variable: Indicator variable if positive exports in columns (1) and (2), value of export in columns (3) and (4). Total exports at the firm-year-destination level.

	Selection of export destination		Export value, weighted by inverse probabilities	
	1 <sup>st</sup> stage	2 <sup>nd</sup> stage	1 <sup>st</sup> stage	2 <sup>nd</sup> stage
	(1)	(2)	(3)	(4)
Visa dummy		-0.003** (0.002)		-3.902** (1.895)
Tariffs (log)	-0.017*** (0.000)	-0.002*** (0.000)	0.024*** (0.006)	0.155** (0.060)
WTO = 1	0.285*** (0.001)	-0.016*** (0.001)	0.404*** (0.013)	1.563** (0.744)
GDP PPP (log)	0.020*** (0.000)	0.006*** (0.000)	0.001 (0.002)	0.244*** (0.028)
FSU=1	-0.517*** (0.001)	0.074*** (0.002)	-0.537*** (0.011)	-1.867* (1.068)
Landlocked = 1	-0.031*** (0.000)	0.010*** (0.000)	-0.089*** (0.008)	-0.242 (0.239)
Contiguity = 1	0.207*** (0.000)	0.033*** (0.001)	0.180*** (0.008)	1.261*** (0.346)
Distance (log)	-0.087*** (0.000)	-0.003*** (0.000)	-0.042*** (0.005)	-0.170 (0.106)
Tourists (artificial, log)	-0.040*** (0.000)		-0.014*** (0.002)	
Observations	3,429,045	3,429,045	47,725	47,725
Number of firm-year	32,602	32,602	9,645	9,645
Firm-Year FE	YES	YES	YES	YES
Cluster	YES	YES	YES	YES

Standard errors in parentheses, \*\*\* p<0.01, \*\* p<0.05, \* p<0.1  
Constant included

OLS estimates with firm-year fixed effects. Columns (1) and (3) show the results of the first stages of instrumented variable estimations. Columns (2) and (4) show the second stage estimations. Observations estimated in the columns (3) and (4) are weighted based on inverse probabilities estimated by regression in column (2).



**Table 4. Estimates on the subsample of relationship-specific exports.**

Dependent variable: Indicator variable if positive export in columns (1) and (2), value of export in columns (3) and (4). Export of relation specific good's export at firm-year-destination level.

	Selection of export destination		Export value, weighted by inverse probabilities	
	1 <sup>st</sup> stage	2 <sup>nd</sup> stage	1 <sup>st</sup> stage	2 <sup>nd</sup> stage
	(1)	(2)	(3)	(4)
Visa dummy		-0.005*** (0.002)		-2.813* (1.657)
Tariffs (log)	-0.016*** (0.000)	-0.002*** (0.000)	0.027*** (0.007)	0.143** (0.066)
WTO = 1	0.286*** (0.001)	-0.018*** (0.001)	0.404*** (0.016)	1.010 (0.680)
GDP PPP (log)	0.020*** (0.000)	0.006*** (0.000)	-0.001 (0.003)	0.217*** (0.033)
FSU=1	-0.518*** (0.001)	0.080*** (0.002)	-0.553*** (0.013)	-1.177 (0.946)
Landlocked = 1	-0.031*** (0.000)	0.010*** (0.000)	-0.083*** (0.009)	-0.225 (0.178)
Contiguity = 1	0.206*** (0.000)	0.036*** (0.001)	0.195*** (0.009)	1.085*** (0.324)
Distance (log)	-0.087*** (0.000)	-0.001** (0.000)	-0.040*** (0.006)	-0.036 (0.077)
Tourists (artificial, log)	-0.041*** (0.000)		-0.014*** (0.003)	
Observations	2,925,511	2,925,511	38,124	38,124
Number of firm-year	27,721	27,721	7,955	7,955
Firm-Year FE	YES	YES	YES	YES
Cluster	YES	YES	YES	YES

Standard errors in parentheses, \*\*\* p<0.01, \*\* p<0.05, \* p<0.1  
Constant included

OLS estimates with firm-year fixed effects. Columns (1) and (3) show the results of the first stages of instrumented variable estimations. Columns (2) and (4) show the second stage estimations. Observations estimated in the columns (3) and (4) are weighted based on inverse probabilities estimated in regression reported in column (2).

**Table 5. Estimates on the subsample of non-relationship specific export.**

Dependent variable: Indicator variable if positive export in columns (1) and (2), value of export in columns (3) and (4). Export of non-relation specific good's export at firm-year-destination level.

	Selection of export destination		Export value, weighted by inverse probabilities	
	1 <sup>st</sup> stage	2 <sup>nd</sup> stage	1 <sup>st</sup> stage	2 <sup>nd</sup> stage
	(1)	(2)	(3)	(4)
Visa dummy		-0.011*** (0.003)		-5.295 (4.238)
Tariffs (log)	-0.016*** (0.000)	-0.002*** (0.000)	0.011 (0.010)	0.095 (0.092)
WTO = 1	0.279*** (0.003)	-0.007*** (0.001)	0.391*** (0.022)	2.303 (1.580)
GDP PPP (log)	0.020*** (0.000)	0.007*** (0.000)	0.004 (0.003)	0.322*** (0.041)
FSU=1	-0.517*** (0.001)	0.041*** (0.003)	-0.497*** (0.023)	-3.169 (2.182)
Landlocked = 1	-0.034*** (0.001)	0.007*** (0.001)	-0.119*** (0.017)	0.048 (0.697)
Contiguity = 1	0.205*** (0.001)	0.029*** (0.002)	0.140*** (0.018)	1.433** (0.611)
Distance (log)	-0.086*** (0.000)	-0.008*** (0.001)	-0.054*** (0.008)	-0.541 (0.349)
Tourists (artificial, log)	-0.040*** (0.000)		-0.018*** (0.003)	
Observations	781,457	781,457	11,181	11,181
Number of firm-year	7,416	7,416	2,247	2,247
Firm-Year FE	YES	YES	YES	YES
Cluster	YES	YES	YES	YES

Standard errors in parentheses, \*\*\* p<0.01, \*\* p<0.05, \* p<0.1  
Constant included

OLS estimations with firm-year fixed effects. Columns (1) and (3) show the results of the first stages of instrumented variable estimations. Columns (2) and (4) show the second stage estimations. Observations estimated in the columns (3) and (4) are weighted based on inverse probabilities estimated in regression reported in column (2).

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## Appendix

**Table A1. Visa regimes and time of their changes between Russia and other countries. 1 stands for visa requirement and 0 for visa waiver. Figure in parenthesis indicate the year of the regime switch and the current visa regime. Time span is 1998 - 2011.**

#	Country	Visa (change)	#	Country	Visa (change)	#	Country	Visa (change)
1	Afghanistan	1	61	Germany	1	121	North Korea	1
2	Albania	1	62	Ghana	1	122	Norway	1
3	Algeria	1	63	Great Britain	1	123	Oman	1
4	Andorra	1	64	Greece	1	124	Pakistan	1
5	Angola	1	65	Grenada	0 (2003)	125	Palau	0
6	Antigua And Barbuda	1	66	Guatemala	1	126	Palestinian Territories	0 (2008)
7	Argentina	0 (2009)	67	Guinea	1	127	Panama	1
8	Armenia	0 (2000)	68	Guinea-Bissau	1	128	Paraguay	1
9	Australia	1	69	Guyana	0 (2010)	129	Peru	0 (2011)
10	Austria	1	70	Haiti	0	130	Philippines	0 (2007)
11	Azerbaijan	0	71	Honduras	0 (2009)	131	Poland	1
12	Bahamas	1	72	Hungary	1	132	Portugal	1
13	Bahrain	0	73	Iceland	1	133	Qatar	1
14	Bangladesh	1	74	India	1	134	Romania	1 (2003)
15	Barbados	1	75	Indonesia	1	135	Rwanda	1
16	Belgium	1	76	Iran	1	136	Saint Kitts And Nevis	1
17	Belize	1	77	Iraq	1	137	Saint Lucia	1
18	Benin	1	78	Ireland	1	138	St Vincent and the Grenadines	0
19	Bolivia	1	79	Israel	0 (2008)	139	Samoa	1
20	Bosnia And Herzegovina	0 (2007)	80	Italy	1	140	San Marino	1
21	Botswana	0 (2006)	81	Jamaica	1	141	Sao Tome And Principe	1
22	Brazil	0 (2010)	82	Japan	1	142	Saudi Arabia	1
23	Brunei Darussalam	1	83	Jordan	1	143	Senegal	1
24	Bulgaria	0 (2001)	84	Kazakhstan	0 (2000)	144	Serbia	0 (2009)
25	Burkina Faso	1	85	Kenya	1	145	Seychelles	0
26	Burundi	1	86	Kuwait	1	146	Sierra Leone	1
27	Cambodia	0 (2010)	87	Kyrgyzstan	1 (2000)	147	Singapore	1
28	Cameroon	1	88	Lao People's Dem R	0 (2007)	148	Slovakia	1
29	Canada	1	89	Latvia	1	149	Slovenia	1
30	Cape Verde	1	90	Lesotho	1	150	Somalia	1
31	Central African Republic	1	91	Liberia	1	151	South Africa	1

32	Chad	1	92	Libya	1	152	South Korea	1
33	Chile	0 (2011)	93	Liechtenstein	1	153	Spain	1
34	China	1	94	Lithuania	1	154	Sri Lanka	0
35	Colombia	0 (2011)	95	Luxembourg	1	155	Suriname	1
36	Congo, Republic Of	1	96	Macedonia	0 (2008)	156	Swaziland	0 (2007)
37	Congo, The Dem Rep	1	97	Madagascar	0	157	Sweden	1
38	Costa Rica	1 (2008)	98	Malawi	1	158	Switzerland	1
39	Cote D'Ivoire	1	99	Malaysia	0 (1998)	159	Syrian Arab Republic	0 (2010)
40	Croatia	0 (2010)	100	Maldives	0	160	Taiwan	1
41	Cuba	0	101	Mali	1	161	Tajikistan	0 (2000)
42	Cyprus	1	102	Malta	1	162	Tanzania	1
43	Czech Republic	1 (2000)	103	Mauritania	1	163	Thailand	0 (2005)
44	Denmark	1	104	Mauritius	1	164	Togo	1
45	Djibouti	0 (2010)	105	Mexico	0 (2010)	165	Tonga	1
46	Dominica	0 (2009)	106	Moldova	0 (2000)	166	Trinidad And Tobago	1
47	Dominican Republic	0 (2009)	107	Monaco	1	167	Tunisia	0
48	Ecuador	0 (2008)	108	Mongolia	1	168	Turkey	0 (2010)
49	Egypt	0 (2007)	109	Montenegro	0 (2009)	169	Turkmenistan	1
50	El Salvador	0 (2009)	110	Morocco	0 (2005)	170	Uganda	0
51	Equatorial Guinea	1	111	Mozambique	1	171	Ukraine	0
52	Eritrea	1	112	Myanmar	1	172	United Arab Emirates	1
53	Estonia	1	113	Namibia	0	173	United States	1
54	Ethiopia	0 (2010)	114	Nauru	1	174	Uruguay	1
55	Fiji	0 (2002)	115	Nepal	1	175	Uzbekistan	0 (2000)
56	Finland	1	116	Netherlands	1	176	Venezuela	0 (2008)
57	France	1	117	New Zealand	1	177	Viet Nam	0 (2009)
58	Gabon	1	118	Nicaragua	0 (2010)	178	Yemen	1
59	Gambia	1	119	Niger	1	179	Zambia	1
60	Georgia	1 (2001)	120	Nigeria	1	180	Zimbabwe	1

**Table A2. Summary statistics**

VARIABLES	Observations with positive total export flows				
	N	mean	sd	min	max
Value of export (log)	85,142	11.76	2.971	-1.238	23.96
Visa = 1	85,142	0.580	0.494	0	1
WTO dummy	84,338	0.687	0.464	0	1
Former Soviet Union dummy	85,142	0.520	0.500	0	1
Landlocked destination dummy	84,777	0.360	0.480	0	1
Contiguity dummy	84,777	0.465	0.499	0	1
GDP PPP (log)	84,392	25.92	1.845	20.43	30.31
Distance (log)	84,777	7.691	0.688	6.638	9.728
Tariffs (log)	64,456	2.476	0.759	0	5.307
Tourists	67,538	1.556e+06	2.482e+06	6	2.504e+07

VARIABLES	Observations with zero total export flows				
	N	mean	sd	min	max
Visa = 1	6.268e+06	0.842	0.365	0	1
WTO dummy	5.04E+06	0.874	0.332	0	1
Former Soviet Union dummy	6.268e+06	0.0661	0.249	0	1
Landlocked destination dummy	6.092e+06	0.198	0.398	0	1
Contiguity dummy	6.092e+06	0.0689	0.253	0	1
GDP PPP (log)	5.129e+06	24.82	1.996	19.01	30.31
Distance (log)	6.092e+06	8.520	0.713	6.638	9.728
Tariffs (log)	4.124e+06	2.595	0.712	0	5.879
Tourists	2.899e+06	582,006	1.999e+06	6	2.504e+07