Direct Versus Indirect Export Channels:

What Determines the Decision?

(18.02.2014) Preliminary version, please do not quote without permision

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Abstract

This paper investigates the determinants of the decision to export indirectly using firm-level data for 27 Eastern and Central European countries and 4 periods. According to the related theories, the interaction between firm heterogeneity and fixed export costs is the main factor explaining this decision (Ahn et al. 2011). The main hypothesis is that this decision is mostly affected by the associated costs to export, which could be extremely high for small and medium firms (Bernard et al. 2011; Zerihun, 2012). Hence, we expect to find higher indirect exports for firms that perceive transportation, crime, legal system and corruption as severe obstacles. A probit and a fixed effect models are estimated to investigate the determinants of the decision to export indirectly and the determinants of the amount exported, respectively. The main results indicate that whereas customs time influences the decision to export indirectly, it does not affect the amount exported indirectly. The latter is mostly determined by the above-mentioned trade costs factors and also by the size of the firm and the ownership structure. We also find in separate estimations for goods and services that transportation and legal system constrains affect service exports to a greater extent than good exports.

Key words: *intermediaries, indirect exporting, Eastern Europe, Central Asia, uncertainty*
JEL classification*: F14, F15, L22, O24*

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I - Introduction

In the past two decades, there has been a growing interest in the study of the internationalization strategies of firms (Bernard et al. 2003; Bernard & Jensen 2004). Three main modes of sales have been considered in the related literature, namely domestic sales, direct exports and exports using an intermediary (indirect exports). A first strand of papers focused on studying the determinants of the choice between exporting or not, without paying attention to the choice between direct and indirect exporting. In this line, according to the seminal paper by Melitz (2003) firms have to pay a fixed entry cost to access foreign markets accompanied by variable trade costs when a product is exported directly. If the fixed cost is high and expected sales are low, a firm is likely to serve only the domestic market. The decision mainly depends on the productivity level of a firm in comparison to other firms in the country. Only the most productive firms will select into exporting, whereas the less productive firms will sell domestically. Trade liberalization will lead to reallocation of firms within industries and to an increase in the average productivity.

As for the choice whether to export directly or indirectly, several factors have been identified in the related literature influencing the decision. Specifically, intermediaries reduce search costs for the producing firms (Spulber 1999), facilitate matching of sellers and buyers (Rubinstein & Wolinsky 1987) and can act as guarantor of quality (Biglaiser 1993). Studies that extend the model of Melitz (2003) with intermediaries indicate that for less productive firms exporting, an option could be via a middleman. Indirect exporting is assumed to have higher marginal costs, but lower or even no fixed costs (Akerman 2010; Ahn et al. 2011; Felbermayr & Jung 2011; Crozet et al. 2013). Firms tend to rely more on intermediaries when fixed costs are high or when destination markets are small and higher-than-average productivity levels are needed to overcome lower profits.

Recent studies investigating the determinants of export behaviour with firm-level data find that productivity of indirect exporters lies between productivity levels of direct and non-exporters (McCann, 2012). McCann (2012) also finds strong evidence supporting the importance of productivity as well as of other features and characteristics of wholesalers as determinants of the export decision. According to Bernard et al. (2011), wholesalers in Italy are smaller than direct exporting manufacturers and export a larger variety of products to less countries. They emphasize

the importance of intermediaries when firms are exporting to destinations with weak contracting environments and when exporting homogeneous products. Crozet et al. (2013) find that French wholesalers mainly serve countries with smaller market size and higher trade costs than the average destination.

Abel-Koch (2011), using survey data for Turkey, shows that indirect exporters are mostly small firms, producing low-quality goods, or introducing an entirely new product to foreign markets, but other factors as foreign ownership or the existence of credit constraints do not influence the decision of exporting indirectly. Also using survey data for firms in Sub-Saharan Africa, Zerihun (2012) provides evidence showing that the decision to export indirectly is positively influenced by firm size, being a subsidiary of a multi-plan firm and having access to information technology and negatively affected by the firms' perceptions of obstacles in the form of corruption or access to finance. McCann (2013) finds that in Eastern Europe and Central Asia single product firms are less likely to export indirectly than multi-product firms, implying a mixing strategy of direct and indirect exporting depending on the product and the destination market.

In the above-mentioned studies, little emphasis has been put on the role of perceived uncertainty on the decision of exporting indirectly. To export directly a firm has to deal with several potential obstacles that can induce additional costs of unforeseeable size. These include, among others, foreign and domestic bureaucracy and corruption, customs proceedings, transportation and cross-border financial transactions. Due to the uncertainty of these costs, risk averse firms may choose to use a middleman in some markets in order to lower the overall exposure to uncertainty. Specially in unstable foreign markets, firms will be willing to accept higher variable costs even if its productivity level is above average. Risk averse firms may also want to test demand in a foreign market using an intermediary first, before taking the decision to pay the fixed costs of entry for direct exporting, especially when fixed costs are high or market potential is low.

We investigate the determinants of the decision to export directly or via intermediaries with a special focus on the firms' perception of uncertainty that affects transaction costs. In particular, factors such transportation impediments, crime, weak legal system and volatility in the exchange rate are considered. To our knowledge, this is the first paper to investigate this issue with a larger variety of measures used as proxies for perceived obstacles to trade. In addition we distinguish between trade in goods and trade in services, because the characteristics of both activities are

different and could be affected by uncertainty in different ways. We focus on the Eastern Europe and Central Asia for three reasons. First, the region is particularly interesting as it consists of many highly integrated countries for historic reasons that share a similar cultural background with most of their direct neighbours and have lower language barriers. Second, in these countries political instability, corruption and criminality are well-known factors deterring a well-functioning market economy. Finally, this is the first paper to focus in the effect of uncertainty on the internationalization strategies of firms in Eastern Europe and Central Asia[1].

We assume that the uncertainty is a greater threat to direct exporters and can be avoided by using an intermediary. The modelling strategy consist on estimating a Probit model to investigate the determinants of the decision to export indirectly and a fixed effects model to estimate the effects on the intensity of the indirect exporting. As a robustness check we also estimate a two-stage approach that consists on estimating the probability to export in the first step as a selection equation and the share of indirect exports with respect to total exports in the second step including elements of the first step to control for selection bias.

The main results suggest that firms with higher sales are less likely to make use of intermediaries and export a smaller share of their exports indirectly. While perception of transportation and the legal system as an obstacle and higher volatility in the exchange rate appears to increase the share of indirect exports especially for services, crime has a similar effect on exports of goods.

The paper is structured as follows: section II analyses the data and explains the empirical approach, section III presents the findings and section IV concludes.

II - Empirical Analysis

In this study we focus on the perception of obstacles to trade and their influence on the decision to export directly or via an intermediary. In order to obtain the variables that will be used as determinants of this decision we combine information from the World Bank Enterprise Business Environment and Enterprise Performance Survey (BEEPS) with country specific information on regional integration and volatility in the exchange rate of the different currencies with respect to

1 McCann (2013) also focuses on the Eastern Europe and Central Asia region. However, his main aim is different to ours, in particular he gives descriptive evidence of the characteristics of indirect exporters and compares the likelihood to export indirectly of single-product and multi-product firms and focus exclusively on manufacturing firms, excluding the service sector from the analysis.

the Euro. Data on exchange rates comes from OANDA Corporation[2]. A description of the variables is shown in Table II.1.

Table II.1: Variables

Variable	Description	Range
Dependent variable		
$Indirectexports_{ijkt}$	share of indirect exports of total exports	0-100
Firm characteristics		
$ln\ Sales_{ijkt}$	natural logarithm of total sales	8-32
$Exportintensity_{ijkt}$	share of exported sales	1-100
$Foreign_{ijkt}$	=1 if a part of the firm is owned by foreign private individuals	0 or 1
$Transportation_{ijkt}$	perception of transportation as an obstacle	0=no obstacle - 4=very severe
$Customs_{ijkt}$	perception of customs and trade regulation as an obstacle	0=no obstacle - 4=very severe
$Crime_{ijkt}$	perception of crime, theft and disorder as an obstacle	0=no obstacle - 4=very severe
$Legalsystem_{ijkt}$	perception of the court system as fair, impartial and uncorrupted	1=agree - 4=disagree
$Customstime_{ijkt}$	number of av. days it tool for exported goods to clear customs	1=1 or less - 5=more than 20
Country variables		
EU_{jt}	=1 if country j was a member of the EU in year t	0 or 1
$CEFTA_{jt}$	=1 if country j was a member of the CEFTA in year t	0 or 1
$Volatility_{jt-1}$	measure for volatility in the exchange rate of j and the Euro in t-1	0-0.47

The dataset includes information taken from BEEPS for 27 countries over 4 years (2002, 2005, 2007 and 2009) and 18 sectors. A number of variables related to transaction costs and uncertainty are selected from the surveys. In particular, foreign ownership, perception of transportation, customs, crime and legal system as being an obstacle for the firm's activity, time needed to clear customs. The surveys used stratified random sampling techniques to select a representative sample for each country using industry, establishment size and region as levels of stratification.

Table II.2 presents a list of covered sectors and the share of firms that use intermediaries for at least a part of their exports. Hence, we use a broad definition of indirect exports, which includes all firms that export through an intermediary, also those using a mixed strategy with part of their foreign sales exported directly[3]. Out of all exporters, most firms in our sample only export directly

2 OANDA.com.

3 We follow McCann (2013) in using the same definition of indirect exports. Although he first used a narrow definition, he justifies the use of the broad definition in the core of his paper.

and around 24 percent use also or exclusively an intermediary. The share varies across sectors going from 11 percent for the IT-sector to 34 percent for hotels and restaurants.

Table II.2: Direct and Indirect Exporters

Sector	Code	Any indirect exports			Total
		No	Yes	%	
Other manufacturing	2	338	139	29.14	477
Food	15	706	227	24.33	933
Text les	17	110	37	25.17	147
Garments	18	245	103	29.60	348
Chemicals	24	98	35	26.32	133
Plast cs & rubber	25	68	26	27.66	94
Non metallic mineral products	26	71	17	19.32	88
Basic metals	27	31	10	24.39	41
Fabricated metal products	28	286	92	24.34	378
Machinery and equipment	29	271	80	22.79	351
Electronics	31	67	19	22.09	86
Construct on	45	162	32	16.49	194
Other services	50	230	39	14.50	269
Wholesale	51	401	120	23.03	521
Retail	52	180	57	24.05	237
Hotel and restaurants	55	69	36	34.29	105
Transport	60	322	118	26.82	440
IT	72	76	9	10.59	85
Total	**-**	**3731**	**1196**	**24.27**	**4927**

Table A1 in the Appendix shows the distribution of exporting firms for all sectors over all countries. The largest sectors in the sample in terms of number of firms are food, wholesale and other manufacturing. Concerning the countries in the sample, Bulgaria, Croatia and Slovenia are the countries with the largest share of firms in the dataset. Summary statistics of firm and country specific variables are displayed in Table II.3. The average share of exports over total sales is 42 percent, of which 17 percent on average are exported indirectly. About 26.5 percent of the firms are at least partly foreign owned and while 36 percent are located in a member of the European Union (EU), 31 percent are located in a member of the Central European Free Trade Agreement (CEFTA).

Table II.3: Summary Statistics

Variable	Obs.	Mean	Std. Dev	Min	Max
		dependent variable			
$Indirectexports_{ijkt}$	4,927	17.206	34.601	0	100
		firm characteristics			
$\ln Sales_{ijkt}$	4,927	14.767	2.264	8.006	32.236
$Export\ intensity_{ijkt}$	4,927	41.894	34.652	1	100
$Foreign_{ijkt}$	4,927	0.265	0.441	0	1
$Transportation_{ijkt}$	4,927	0.818	1.146	0	4
$Customs_{ijkt}$	4,927	1.211	1.162	0	4
$Crime_{ijkt}$	4,927	0.947	1.137	0	4
$Legalsystem_{ijkt}$	4,927	2.501	0.979	1	4
$Customstime_{ijkt}$	3,542	1.711	0.924	1	5
		country specific variables			
EU_{jt}	4,927	0.362	0.481	0	1
$CEFTA_{jt}$	4,927	0.313	0.464	0	1
$Volatility_{jt-1}$	4,309	0.020	0.043	0	0.470

II.I - Model Specification

The first part of our econometric approach consists on estimating a Probit model with country and industry fixed effects to explain the probability of exporting indirectly. In a second step we estimate a OLS-FE regression, using the share of indirect exports over total exports as dependent variable. In addition, as a robustness we will use a 2-stage approach to correct for a potential sample selection bias, which could be present due to the fact that we restrict our sample to exporting firms only.

The specification of the Probit model used to predict indirect exports is given by,

$$Pr\left(IndirectExporter_{ijkt}=1\right)=\Phi\left(\beta_0+\beta_1\ln Sales_{ijkt}+\beta_2 Exportintensity_{ijkt}+\beta_3 Foreign_{ijkt}+\beta_4 Transportation_{ijkt}\right)$$
$$+\beta_5 Customs_{ijkt}+\beta_6 Crime_{ijkt}+\beta_7 Legalsystem_{ijkt}+\beta_8 Corruption_{ijkt}+\beta_9 Customstime_{ijkt}+$$
$$\beta_{10} EU_{jt}+\beta_{11} CEFTA_{jt}+\beta_{12} Volatility_{jt-1}+\kappa_j+\lambda_{kt}+\varepsilon_{ijkt} \quad (1)$$

where $IndirectExporter_{ijkt}$ is a dummy variable that takes the value one if firm *i* in country *j* and sector *k* exports a part of its foreign sales using an intermediary and zero if all exports are direct exports. Firm specific variables include $\ln Sales_{ijkt}$, which is the natural log of sales,

Exportintensity$_{ijkt}$, that denotes the share of exported sales and Foreign$_{ijkt}$, which is dummy variable that takes the value of one when a part of the firm is owned by a foreign individual or firm and zero otherwise[4]. A firms' Perception of obstacles is captured by three different variables on a scale from zero to four. First, for transportation (Transportation$_{ijkt}$), second for customs and trade regulation (Customs$_{ijkt}$) and third for crime, theft and disorder (Crime$_{ijkt}$). The perception of fairness of the legal system is also measured on a scale from one to four (Legalsystem$_{ijkt}$), while for time efficiency of customs authorities we use a scale from one to five (Customstime$_{ijkt}$). We introduce country specific dummy variables that take the value one if country j is member of the European Union (EU$_{jt}$) or the Central European Free Trade Agreement (CEFTA$_{jt}$) in year t and a measure of volatility for the nominal exchange rate of the domestic currency with the Euro (Volatility$_{jt-1}$). The latter is defined as the standard deviation of the first difference of the logarithms of the monthly domestic nominal exchange rate to the Euro for the twelve month of the past year:

$$Volatility_{jt-1} = \text{Std. dev.}\left[\ln(e_{j,m}) - \ln(e_{j,m-1})\right], m = 1...12 \quad . \text{ (2)}$$

In a next step, we estimate the determinants of a firms' intensity of indirect exports with pooled OLS:

$$\begin{aligned} Indirectexports_{ijkt} = {} & \beta_0 + \beta_1 \ln Sales_{ijkt} + \beta_2 Exportintensity_{ijkt} + \beta_3 Foreign_{ijkt} + \\ & \beta_4 Transportation_{ijkt} + \beta_5 Customs_{ijkt} + \beta_6 Crime_{ijkt} + \beta_7 Legalsystem_{ijkt} + \beta_8 Corruption_{ijkt} + \\ & \beta_9 Customstime_{ijkt} + \beta_{10} EU_{jt} + \beta_{11} CEFTA_{jt} + \beta_{12} Volatility_{jt-1} + \kappa_j + \lambda_{kt} + \varepsilon_{ijkt} \end{aligned} \quad , \text{(3)}$$

where the dependent variable is the share of indirect exports of total exports for firm i in year t. All other variables are identical to the model in (1).

The previous two models assume that firms first decide whether or not to export and second about the modality and that both decisions are independent from each other. Following the approach of Heckman (1978), we estimate a 2-stage model that allows us to control for the sample selection bias caused by ignoring non-exporters and by assuming that the error term in equation (1) and (3) are independent.

In the first stage, we estimate a Probit model on the probability to export,

4 We are unable to include a measure of productivity in the model, as the World Bank firm-level data for the selected region does not provide the number of employees for each firm, but only a discrete variable with 4 group-size categories.

$$Pr(Exporter_{ijkt}=1)=\beta_0+\beta_1 \ln Sales_{ijkt}+\beta_2 Foreign_{ijkt}+\beta_3 Transportation_{ijkt}+\beta_4 Customs_{ijkt} \\ +\beta_5 Crime_{ijkt}+\beta_6 Legalsystem_{ijkt}+\beta_7 EU_{jt}+\beta_8 CEFTA_{jt}+\beta_9 Volatility_{jt-1}+\kappa_j+\lambda_{kt}+\varepsilon_{ijkt} \quad . (4)$$

The second stage is estimated using an OLS-FE model and is given by,

$$Indirectexports_{ijkt}=\beta_0+\beta_1 \ln Sales_{ijkt}+\beta_2 Foreign_{ijkt}+\beta_3 Transportation_{ijkt}+\beta_4 Crime_{ijkt}+ \\ \beta_5 Legalsystem_{ijkt}+\beta_6 EU_{jt}+\beta_7 CEFTA_{jt}+\beta_8 Volatility_{jt-1}+IMR+\kappa_j+\lambda_{kt}+\varepsilon_{ijkt} \quad . (5)$$

In order to fulfil the exclusion restriction, we use a variable that only affects the probability to export, but not the intensity of indirect exporting. We estimate the second stage without the variable measuring the perception of customs proceedings as an obstacle, which yields no significant estimates when controlling for differences between countries in the sample.

In the second step regression, we include the inverse mills ratio (IMR) to the model in the second stage. It is a correction for sample selection which addresses the biases generated by unobserved shocks.

III - Main Findings

Results from the Probit estimation as denoted in equation (1) are shown in Table III.1. A number of versions are estimated including different sets of fixed effects and control variables. Columns (1) show the results from estimating the model with country, year and industry fixed effects, while colunm (2) includes couuntry and industry-year fixed effects (as specified in model (1)). The inclusion of the exchange rate volatility variable reduces the sample size considerably, hence for comparison purposes the model is estimated in columns (3) and (4) with and without this variable for the same sample. Finally in column (5) the variable customs time, for which there are many missing observations is added.

According to our estimates, larger firms in terms of higher sales tend to have a lower probability to export indirectly, whereas firms with a larger share of total sales going to non-domestic markets are more likely to export using an intermediary. A possible explanation for the latter could be the greater exposure to uncertainty concerning expected profits when exporting directly, which increases when exporting a lot. The use of an intermediary lowers uncertainty as it only involves higher variable costs. In particular, A 10 percentage points increase in overall export intensity of a firm increases the probability to use an intermediary by 0.5 percent according to column (2). A 10 percent increase in total sales decreases the probability to use an intermediary by 8 percent

(column 2). The estimates turn out to be positive and insignificant when a variable controlling for the time to clear customs is included in the model, this is probably due to the fact that the inclusion of this variable considerably reduces the number of observations (by around one fifth).

Foreign ownership decreases the probability of export indirectly by 7 percentage points. This fact could be explained by the lower fixed costs of exporting or accessing to the owners international network. While potential obstacles like transportation, crime and the legal system lower the probability to export directly significantly, customs impediments does not show a statistically significant effect. A 1 point increase in the perception of the severity increases the probability of indirect exporting by around 2 percentage points for transportation, 1.4 percentage points for crime and 1.5 percentage points for the legal system. Longer time to clear customs and volatility in the exchange rate also increase the probability of exporting indirectly. Although the decision for the mode of export appears to be affected significantly by the perception of uncertainty in various fields, we do not find any significant effects of membership in EU or CEFTA on the probability to use an intermediary.

Table III.1: Regression Results - Probability to Export Indirectly

	(1)	(2)	(3)	(4)	(5)
lg Sales$_{ijkt}$	-0.0084**	-0.0084**	-0.0168***	-0.0172***	0.000467
	(0.00336)	(0.00342)	(0.00399)	(0.00400)	(0.00330)
Export intensity$_{ijkt}$	0.00050***	0.00050***	0.00072***	0.00072***	0.00099***
	(0.000191)	(0.000192)	(0.000210)	(0.000210)	(0.000177)
Foreign$_{ijkt}$	-0.0699***	-0.0734***	-0.0673***	-0.0656***	-0.0370***
	(0.0137)	(0.0137)	(0.0152)	(0.0152)	(0.0127)
Transportation$_{ijkt}$	0.0190***	0.0186***	0.0178***	0.0177***	0.0191***
	(0.00590)	(0.00591)	(0.00636)	(0.00635)	(0.00543)
Customs$_{ijkt}$	0.00444	0.00404	0.00501	0.00511	0.00179
	(0.00601)	(0.00603)	(0.00650)	(0.00650)	(0.00572)
Crime$_{ijkt}$	0.0147**	0.0146**	0.0137**	0.0133**	0.0103*
	(0.00577)	(0.00580)	(0.00630)	(0.00630)	(0.00540)
Legalsystem$_{ijkt}$	0.0138**	0.0148**	0.0177**	0.0174**	0.00979
	(0.00700)	(0.00704)	(0.00776)	(0.00776)	(0.00671)
EU$_{jt}$	-0.0558	-0.0672	-0.0431	-0.00419	0.00409
	(0.0506)	(0.0510)	(0.0698)	(0.0761)	(0.0522)
CEFTA$_{jt}$	-0.0127	-0.0196	0.0129	0.0580	0.00732
	(0.0353)	(0.0358)	(0.0520)	(0.0600)	(0.0349)
Customstime$_{ijkt}$	-	-	-	-	0.0172***
					(0.00634)
Volatility$_{jt-1}$	-	-	-	0.454**	-
				(0.206)	
Year Dummies	Yes	No	No	No	No
Industry Dummies	Yes	No	No	No	No
Country Dummies	Yes	Yes	Yes	Yes	Yes
Year-Industry Dum.	No	Yes	Yes	Yes	Yes
Observations	4,927	4,925	4,296	4,296	3,419
R^2	0.0444	0.0525	0.0554	0.0565	0.0729

*Notes: Reported values are marginal effects at the mean of the independent variables; Robust standard errors in parentheses; *** p<0.01, ** p<0.05, * p<0.1; Sample in (3) is reduced to the same observations as used in (4).*

OLS regression estimates of model (3), with the share of indirect exports as the dependent variable are provided in Table III.2. The main results are in general similar to the ones of the previous model in terms of sing and significance level. The main difference is that estimates for country specific dummy variables for EU and CEFTA membership yield significant results indicating that membership in either of the two agreements decreases the share of indirect exports. This can be attributed to economic integration facilitating export procedures and thereby lowering fixed costs of exporting, which in turn affect mainly direct exporting. The effect is larger for the EU with a decrease in the share of indirect exports of around 11 percentage points (column (2)) than for CEFTA with a decrease of around 5 percentage points.

Both variables turn insignificant when controls for exchange rate volatility and time to clear customs are added to the model. However, we are able to show in column (3), which shows insignificant estimates for both agreements, that this is due to the reduction in observations and not to the inclusion of the additional variables. Column (3) includes the same variables included column (2), but reducing the number of observations to match column (4). While the effect of higher export intensity is positive and highly significant for the probability to export indirectly, it is only significant at the 10 percent level and mostly negative for the share of indirect exports.

Table III.2: Regression Results - OLS_FE on the Share of Indirect Exports

	(1)	(2)	(3)	(4)	(5)
ln Sales$_{ijkt}$	-1.226***	-1.194***	-1.848***	-1.889***	-0.0191
	(0.286)	(0.290)	(0.327)	(0.328)	(0.187)
Export intensity$_{ijkt}$	-0.0288*	-0.0290*	-0.0180	-0.0186	0.0325***
	(0.0151)	(0.0152)	(0.0166)	(0.0166)	(0.00933)
Foreign$_{ijkt}$	-4.777***	-5.042***	-4.103***	-3.913***	-1.964***
	(1.090)	(1.096)	(1.188)	(1.190)	(0.638)
Transportation$_{ijkt}$	1.290**	1.218**	1.181**	1.178**	0.788**
	(0.514)	(0.514)	(0.542)	(0.541)	(0.320)
Customs$_{ijkt}$	-0.223	-0.228	-0.300	-0.287	0.0946
	(0.487)	(0.489)	(0.524)	(0.524)	(0.313)
Crime$_{ijkt}$	1.221**	1.221**	1.113**	1.074**	0.385
	(0.492)	(0.492)	(0.529)	(0.529)	(0.302)
Legalsystem$_{ijkt}$	1.048*	1.047*	1.132*	1.116*	0.552*
	(0.559)	(0.564)	(0.620)	(0.620)	(0.335)
EU$_{jt}$	-10.74***	-11.74***	-8.322	-5.616	-2.478
	(3.950)	(4.035)	(5.071)	(5.106)	(2.433)
CEFTA$_{jt}$	-4.638*	-5.027*	-1.705	1.516	-1.571
	(2.619)	(2.679)	(3.491)	(3.571)	(1.513)
Customstime$_{ijkt}$	-	-	-	-	0.692*
					(0.357)
Volatility$_{jt-1}$	-	-	-	41.94***	-
				(16.22)	
Constant	27.12***	40.19***	50.67***	50.47***	-6.168*
	(5.403)	(12.38)	(17.36)	(17.35)	(3.420)
Year Dummies	Yes	No	No	No	No
Industry Dummies	Yes	No	No	No	No
Country Dummies	Yes	Yes	Yes	Yes	Yes
Year-Industry Dum.	No	Yes	Yes	Yes	Yes
Observations	4,927	4,927	4,309	4,309	3,542
R^2	0.050	0.059	0.064	0.066	0.047

*Notes: Robust standard errors in parentheses; *** p<0.01, ** p<0.05, * p<0.1; Sample in (3) is reduced to the same observations as used in (4).*

III.I - Goods versus Services

The used dataset covers firms producing goods and services and both are very different in terms of export procedures. For this reason we present in this section separate estimates for each type of firms. In this way we will be able to analyse the differences in the impact of perception of uncertainty on the decision to export indirectly between both sets of exporters. Therefore, we estimate the models (1) and (3) separately for goods and services with the same specification as in column (2) and (4) in Table III.1 and Table III.2 to be able to compare the estimates. Table III.3 shows the results for goods in columns with uneven numbers and for services in columns with even numbers. The table is divided into two parts. The first show the results of estimating model (3) and the second model (1).

According to the results shown in columns (1) and (2) of Table III.3 for goods and services, respectively and for the whole sample, export intensity has a significant negative impact on the share of indirectly exported services, whereas the effect for goods is non-significant. Foreign ownership promotes direct exports only of goods, but not for services. As regards the regional integration dummies, EU membership decreases indirect export intensity to a very similar extent for goods and services, while CEFTA membership does so only for services. The effect of volatility in the exchange rate to the Euro, shown in column (4), increases the probability of indirect exports for services only, but no effect is found for goods. A similar outcome is obtained for the legal-system variable, which only show a positive and significant estimate for indirect exports of services. While perception of crime as an obstacle has a significant impact on the probability to export directly and their volume of goods, Transportation has a higher and more significant impact on the choice of the export channel for services than for goods.

Summarizing, determinants of the probability to export indirectly differ to some extent for goods and services. While the perception of crime as an obstacle appears to be more important for trade in goods, exports of services are more affected by uncertainty related to future revenues (exchange rate volatility) and to a well-functioning legal system. The first outcome seems intuitive when considering crime in the form of physical theft of goods. The latter could be due to peculiarities of the service sectors in general that make it more vulnerable to fluctuations in the exchange rate. For instance, infrequent use of indirect hedging as less inputs are needed in the production process of services or more difficult access to financial hedging due to a lack of assets

could be some of the reasons. Furthermore, transportation is a greater concern for firms in the service sector. Than for firms in goods sectors A likely explanation is that services are frequently non-traded goods and often provided in locations close to the customer. In such a case, transportation obstacles could be a serious concern. For exports in goods instead, transport is usually taken care of by a logistics company, which is in turn the one affected by obstacles with regard to the transportation of goods. From the perspective of the firm, these obstacles do increase the costs of exporting and thereby affect the decision to export[5]. But as transporting the goods is not a direct issue the firm have to deal with, perception of transportation as an obstacle might be seen only with reference to transportation conducted by the firm itself. Results may look different for questions regarding the perception of other trade costs as an obstacle, different form transportation. Unfortunately, questions going in this direction are not included in the survey of the World Bank.

5 See section III.II for the impact of the perception of transportation as an obstacle on the decision to export at all.

Table III.4: Regression Results - Goods versus Services

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	OLS	OLS	OLS	OLS	Probit	Probit	Probit	Probit
	Goods	Services	Goods	Services	Goods	Services	Goods	Services
lg Sales$_{ijkt}$	-1.306***	-1.290***	-2.117***	-1.699***	-0.0101**	-0.00760	-0.0192***	-0.0149**
	(0.385)	(0.458)	(0.433)	(0.509)	(0.00461)	(0.00526)	(0.00540)	(0.00609)
Exportintensity$_{ijkt}$	-0.00396	-0.0710***	0.0125	-0.0774***	0.00062**	0.000290	0.00088***	0.000359
	(0.0190)	(0.0255)	(0.0204)	(0.0287)	(0.000243)	(0.000322)	(0.000263)	(0.000362)
Foreign$_{ijkt}$	-7.415***	-2.189	-6.429***	-0.418	-0.105***	-0.0357	-0.0987***	-0.0204
	(1.369)	(1.878)	(1.453)	(2.074)	(0.0173)	(0.0223)	(0.0189)	(0.0256)
Transportation$_{ijkt}$	0.805	1.809**	0.857	1.629*	0.0132*	0.0266***	0.0141*	0.0226**
	(0.622)	(0.900)	(0.653)	(0.948)	(0.00754)	(0.00958)	(0.00807)	(0.0103)
Customs$_{ijkt}$	-0.750	0.632	-0.637	0.376	-0.000216	0.00890	0.00188	0.00816
	(0.631)	(0.779)	(0.668)	(0.852)	(0.00783)	(0.00942)	(0.00838)	(0.0104)
Crime$_{ijkt}$	1.969***	-0.148	1.733***	-0.182	0.0218***	0.00247	0.0192**	0.00443
	(0.622)	(0.809)	(0.666)	(0.870)	(0.00744)	(0.00927)	(0.00803)	(0.0102)
Legalsystem$_{ijkt}$	0.475	1.825**	0.677	1.876*	0.0115	0.0180*	0.0169*	0.0178
	(0.730)	(0.894)	(0.794)	(1.001)	(0.00921)	(0.0109)	(0.0101)	(0.0122)
EU$_{jt}$	-11.36**	-11.07*	-8.714	-2.120	-0.0617	-0.0414	-0.0593	0.0912
	(5.389)	(6.294)	(6.860)	(8.049)	(0.0708)	(0.0768)	(0.0985)	(0.127)
CEFTA$_{jt}$	-2.535	-7.728*	0.465	3.329	0.0139	-0.0472	0.0286	0.108
	(3.650)	(4.066)	(5.220)	(5.161)	(0.0512)	(0.0516)	(0.0796)	(0.0950)
Volatility$_{jt-1}$	-	-	6.117	85.45***	-	-	-0.0783	0.984***
			(20.85)	(24.05)			(0.321)	(0.294)
Constant	42.76***	22.27**	54.11***	22.83**	-	-	-	-
	(12.97)	(8.970)	(18.12)	(9.895)				
Observations	3,076	1,851	2,690	1,619	3,076	1,843	2,690	1,600
R^2	0.062	0.076	0.072	0.084	0.0525	0.0712	0.0588	0.0751

*Notes: Reported values for probit regressions are marginal effects at the mean of the independent variables; Robust standard errors in parentheses; *** p<0.01, ** p<0.05, * p<0.1. Country and year-industry fixed effects included in all regressions.*

In order to assess the relative importance of each of the variables in model (5) in comparison to our measure of exchange rate volatility, we present beta coefficients in Table III.5. Beta coefficients are measured in standard deviations and therefore the magnitude of the coefficients can be compared also for variables measured in different units. As shown in column (1), which contains the beta coefficients for the model in Table III.2 column (2), a one standard deviation increase in export intensity decreases the share of indirect exports on total exports by 0.0187 standard deviations. Beta coefficients based on models estimated on Table III.4 columns (3) and (4) indicate the relative importance of sales for goods and services, respectively and of foreign ownership for

goods (column 2, Table III.5) in explaining the share of intermediated exports and show the large impact of exchange rate volatility on services (column 3).

Table III.5: Beta Coefficients

	(1)	(2)	(3)
	OLS All	OLS Goods	OLS Services
ln Sales$_{ijkt}$	-0.123	-0.136	-0.111
Export ntensity$_{ijkt}$	-0.0187	0.0127	-0.0723
Foreign$_{ijkt}$	-0.0797	-0.125	-0.0297
Transportat on$_{ijkt}$	0.0209	0.00629	0.0470
Customs$_{ijkt}$	-0.0492	-0.0815	-0.00518
Crime$_{ijkt}$	0.0396	0.0290	0.0539
Legalsystem$_{ijkt}$	-0.00965	-0.0216	0.0124
EU$_{jt}$	0.0355	0.0577	-0.00593
CEFTA$_{jt}$	0.0315	0.0190	0.0534
Volat lity$_{jt-1}$	0.0521	0.00712	0.116
Year Dummies	No	No	No
Industry Dummies	No	No	No
Country Dummies	Yes	Yes	Yes
Year-Industry Dum.	Yes	Yes	Yes
Observat ons	4,309	2,690	1,619
R^2	0.066	0.072	0.084

Notes: Reported values are beta coef cients.

III.II - Robustness: Two-Stage Approach

Estimates for the 2-stage approach are presented in Table III.6. The first stage uses as dependent variable the probability to export and the second stage the share of indirect exports. While sales and foreign ownership increase a firms' probability to export and decreases the share of indirect exports, stronger perception of crime and transportation as an obstacle decreases the probability to export and increases the share of intermediated exports. The quality of the legal system only seems to affect the choice of the export mode by promoting direct exports, but it does not seem to affect the decision to export. Surprisingly, the variable customs proceedings shows a significant and positive effect on the probability to export, indicating that when customs proceedings are seeing as mayor obstacle, firms are more likely to export. Apparently, only firms that do export see customs proceedings as a problem. As explained in Section II, we exclude the latter variable from the second stage to fulfil the exclusion restriction.

Euro and CEFTA dummies as controls for economic and trade integration have a significant positive impact on the probability to the export of 12 and 6 percentage points and decrease the share of intermediated exports by 12 and 5 percent. Both variables turn insignificant when the measure of exchange rate volatility to the Euro is introduced. While volatility has no significant impact on the probability to export, it increases the share of indirect exports. The fact that the Inverse Mills Ratio is insignificant in the second stage indicates that there is no evidence that a selection bias is present.

Table III.6: Regression Results - Heckman 2-Stage

	(1)	(2)	(3)	(4)
	1st Stage Probit	2nd Stage OLS	1st Stage Probit	2nd Stage OLS
lg Sales$_{ijkt}$	0.0646***	-1.711***	0.1377***	-0.969**
	(0.00241)	(0.489)	(0.00200)	(0.419)
Foreign$_{ijkt}$	0.173***	-3.640***	0.197***	-4.518***
	(0.0141)	(1.399)	(0.0125)	(1.417)
Transportation$_{ijkt}$	-0.00996**	1.113**	-0.00807**	1.181**
	(0.00418)	(0.511)	(0.00375)	(0.485)
Customs$_{ijkt}$	0.0678***	-	0.0638***	-
	(0.00403)		(0.00355)	
Crime$_{ijkt}$	-0.0290***	0.973*	-0.0311***	1.090**
	(0.00388)	(0.535)	(0.00349)	(0.503)
Legalsystem$_{ijkt}$	0.00711	1.151*	0.00262	1.093*
	(0.00481)	(0.619)	(0.00423)	(0.563)
EU$_{jt}$	-0.0139	-6.084	0.123***	-11.86***
	(0.0423)	(5.104)	(0.0333)	(4.067)
CEFTA$_{jt}$	-0.0450	1.287	0.0632***	-5.007*
	(0.0305)	(3.564)	(0.0222)	(2.712)
Volatility$_{jt-1}$	-0.194	38.99**	-	-
	(0.136)	(16.88)		
Inverse Mills Ratio	-	-6.499	-	-6.880
		(7.151)		(6.651)
Constant	-	48.32***	-	36.88***
		(18.38)		(13.30)
Country Dummies	Yes	Yes	Yes	Yes
Year-Industry Dum.	Yes	Yes	Yes	Yes
Observations	13,645	4,309	16,327	4,927
R^2	0.280	0.066	0.273	0.059

*Notes: Reported values for probit regressions are marginal effects at the mean of the independent variables; Robust standard errors in parentheses; *** p<0.01, ** p<0.05, * p<0.1.*

IV - Conclusion

Although being vague in its' nature, uncertainty, measured as the perceived severity of obstacles, appears to play an important role in explaining a firms' choice between direct and indirect exporting and seems to have a slightly different impact for goods and services.

Firms that are large, foreign owned and export a higher share of their production prefer direct exporting, while uncertainty in different fields makes firm prefer the use of intermediaries. In particular, the perception of potential threats like criminality, problems with the transport infrastructure or the legal system have a significant impact on the mode of export. Furthermore, we show that uncertainty about future revenues due to volatility in the domestic exchange rate increases the share of indirect exports on total exports for services, but has no significant impact on exports of goods. We could also show that our results are not driven by sample selection bias and the inclusion of various controls confirms its robustness.

Finally, our findings highlight the importance of intermediaries in countries where firms perceive challenges in the business environment that increase the level of uncertainty and in turn the fixed costs of exporting. Lowering perceived uncertainty as well as improving conditions for intermediaries would help domestic firms with their exporting activities.

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Appendix

Table A1: Covered Countries and Sectors

Country	Sector																			
	2	15	17	18	24	25	26	27	28	29	31	45	50	51	52	55	60	72	**All**	%
Albania	10	25	9	5	3	0	1	3	3	0	0	2	6	12	3	16	28	0	**126**	2.56
Belarus	15	29	4	4	3	2	3	0	3	4	0	18	2	24	3	2	29	1	**146**	2.96
Georgia	4	29	2	1	1	0	3	1	0	1	0	3	9	6	5	0	10	0	**75**	1.52
Tajikistan	6	18	9	4	3	2	2	1	0	1	1	2	2	13	1	0	1	0	**66**	1.34
Ukraine	26	61	5	26	6	0	2	0	10	51	1	4	23	22	4	6	24	1	**272**	5.52
Uzbekistan	6	36	6	3	6	2	3	0	0	7	1	0	7	7	0	0	8	1	**93**	1.89
Russia	24	46	3	4	31	3	1	4	11	38	8	10	8	13	2	1	12	0	**219**	4.44
Poland	19	49	6	39	2	11	6	3	43	34	2	14	12	37	8	2	40	5	**332**	6.74
Romania	16	24	3	45	3	2	5	3	17	20	0	2	7	9	6	9	16	3	**190**	3.86
Serbia	29	36	12	5	8	5	3	2	17	7	2	12	13	28	18	5	21	2	**225**	4.57
Kazakhstan	7	42	0	2	2	0	1	0	4	9	2	5	4	15	0	0	2	0	**95**	1.93
Moldova	9	47	2	15	0	0	2	0	15	2	1	0	7	12	13	1	15	0	**141**	2.86
Bosnia	35	17	1	6	2	4	2	2	13	9	0	19	4	18	6	4	15	0	**157**	3.19
Azerbaijan	2	12	2	1	1	0	0	0	0	2	0	3	0	2	1	1	1	0	**28**	0.57
FYROM	26	16	6	24	4	0	5	2	6	3	2	13	2	20	11	2	21	2	**165**	3.35
Armenia	8	56	3	8	5	5	3	1	3	6	1	0	5	5	0	1	7	3	**120**	2.44
Kyrgyz	8	23	9	1	1	1	3	0	2	2	1	2	4	10	1	0	6	0	**74**	1.50
Estonia	33	22	3	6	1	3	3	0	7	3	3	12	16	17	13	9	18	2	**171**	3.47
Czech Republic	28	37	2	1	4	7	4	6	16	15	5	7	22	24	14	2	20	5	**219**	4.44
Hungary	16	43	7	20	4	10	5	5	69	33	3	14	12	31	17	8	16	0	**313**	6.35
Latvia	25	35	0	7	0	0	1	0	3	1	0	7	13	17	11	2	20	0	**142**	2.88
Lithuania	28	35	11	5	1	3	4	0	3	7	4	7	11	27	18	2	31	0	**197**	4.00
Slovakia	12	26	1	4	5	2	1	4	7	14	1	11	26	24	12	2	15	2	**169**	3.43
Slovenia	23	44	8	3	6	10	6	2	28	28	3	16	28	42	38	11	32	7	**335**	6.80
Bulgaria	22	63	12	83	25	15	7	1	23	40	36	3	13	40	10	3	18	49	**463**	9.40
Croat a	37	62	21	26	6	7	11	1	73	14	9	8	13	44	19	16	14	1	**382**	7.75
Montenegro	3	0	0	0	0	0	1	0	2	0	0	0	0	2	3	0	0	1	**12**	0.24
Total	**477**	**933**	**147**	**348**	**133**	**94**	**88**	**41**	**378**	**351**	**86**	**194**	**269**	**521**	**237**	**105**	**440**	**85**	**4927**	100
%	9.68	18.9	2.98	7.06	2.7	1.9	1.79	0.8	7.67	7.12	1.7	3.94	5.46	10.6	4.81	2.13	8.93	1.7	100	

Notes: Sectors 45-72 are considered as selling services.

Table A2: Correlation

	$Indirectexports_{ijkt}$	$lg\ Sales_{ijkt}$	$Export\ intensity_{ijkt}$	$Foreign_{ijkt}$	$Transportation_{ijkt}$	$Customs_{ijkt}$	$Crime_{ijkt}$	$Legalsystem_{ijkt}$	$Corruption_{ijkt}$	EU_{jt}	$CEFTA_{jt}$	$Volatility_{jt-1}$
$Indirectexports_{ijkt}$	1.000	0.037	0.055	-0.039	0.083	0.018	0.046	-0.006	0.022	0.007	0.050	0.003
$lg\ Sales_{ijkt}$	0.037	1.000	0.008	0.078	0.142	0.022	0.067	0.001	0.116	-0.105	0.040	0.014
$Export\ intensity_{ijkt}$	0.055	0.008	1.000	0.145	0.003	0.004	-0.036	-0.028	0.044	-0.012	-0.013	-0.054
$Foreign_{ijkt}$	-0.039	0.078	0.145	1.000	-0.003	0.053	-0.057	0.024	-0.022	0.044	-0.024	-0.008
$Transportation_{ijkt}$	0.083	0.142	0.003	-0.003	1.000	0.353	0.261	-0.136	0.035	0.095	0.095	0.050
$Customs_{ijkt}$	0.018	0.022	0.004	0.053	0.353	1.000	0.239	-0.112	-0.155	0.308	0.162	0.112
$Crime_{ijkt}$	0.046	0.067	-0.036	-0.057	0.261	0.239	1.000	-0.136	-0.030	0.152	0.091	0.069
$Legalsystem_{ijkt}$	-0.006	0.001	-0.028	0.024	-0.136	-0.112	-0.136	1.000	0.067	-0.071	-0.051	-0.087
$Customstime_{ijkt}$	-0.027	-0.172	0.050	-0.033	-0.093	-0.006	-0.076	0.061	-0.566	-0.011	-0.161	-0.128
EU_{jt}	0.007	-0.105	-0.012	0.044	0.095	0.308	0.152	-0.071	-0.232	1.000	0.109	0.115
$CEFTA_{jt}$	0.050	0.040	-0.013	-0.024	0.095	0.162	0.091	-0.051	-0.022	0.109	1.000	0.036
$Volatility_{jt-1}$	0.003	0.014	-0.054	-0.008	0.050	0.112	0.069	-0.087	-0.208	0.115	0.036	1.000