The effect of euro adoption on firm-level export

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Abstract

We investigate the effect of the euro adoption on exports using firm-level data from Slovakia and Estonia. In contrast to previous studies, we focus on countries that adopted euro one by one and had different exchange rate regimes prior to the euro adoption. Following the New Trade Theory we consider three types of adjustments: firm selection, changes in product varieties and changes in average value of exports that compose the individual firm exports. The euro effect is identified by a difference in differences style dummy variable based on firm export to the euro area countries compared to the EU countries that are not members of the euro area. The results highlight the importance of transaction costs channel related to exchange rate volatility. We find strong pro-trade effect of euro in Slovakia that switched to euro from a floating exchange rate and almost no effect in Estonia that had a fixed exchange rate to euro prior to the euro changeover. Our findings indicate that the euro effect manifested itself mainly via the intensive margin and that the gains in trade were heterogeneous across firm characteristics.

While there is an ample macro-level evidence that the euro changeover had positive impact on trade, the micro-level analyses remain limited to a small number of countries. Baldwin et al. (2008) offer first unconditional evidence on the euro trade effect for France and Belgium and confirm newly trade goods hypothesis. However, the conditional estimates with more rigorous approach are not conclusive. Some authors find statistically significant impact of trade cost reduction related to the euro adoption (e.g. Berthou and Fontagne (2008, 2008a and 2013)), some find no statistically significant effect on total firm-level export, but find expansion to new markets or new product margins (Nitsch and Pisu (2008) or De Nardis et al. (2008)).

Our sample and data

In contrary to the literature studying the effect of euro on trade using data from the introduction of euro in 1999, we use two cases where euro was introduced in one country at the time, so that there was no increased competition effect from other countries. The timing of the effect is concentrated, the euro was introduced for electronic and cash transactions at the same time; and a much larger control group of EU destination markets is available compared to the period during the introduction of euro. Most importantly, the cases analysed in this paper, Slovakia and Estonia, provide comparative evidence on the role of the pre-euro exchange rate regime. Slovakia had a floating exchange rate with euro prior to the changeover, while Estonia had a currency board system with a strict peg to euro.

Figure 1. Exchange rate volatility with euro area and non-euro area EU countries, Slovakia 2006-2011, Estonia 2008-2013
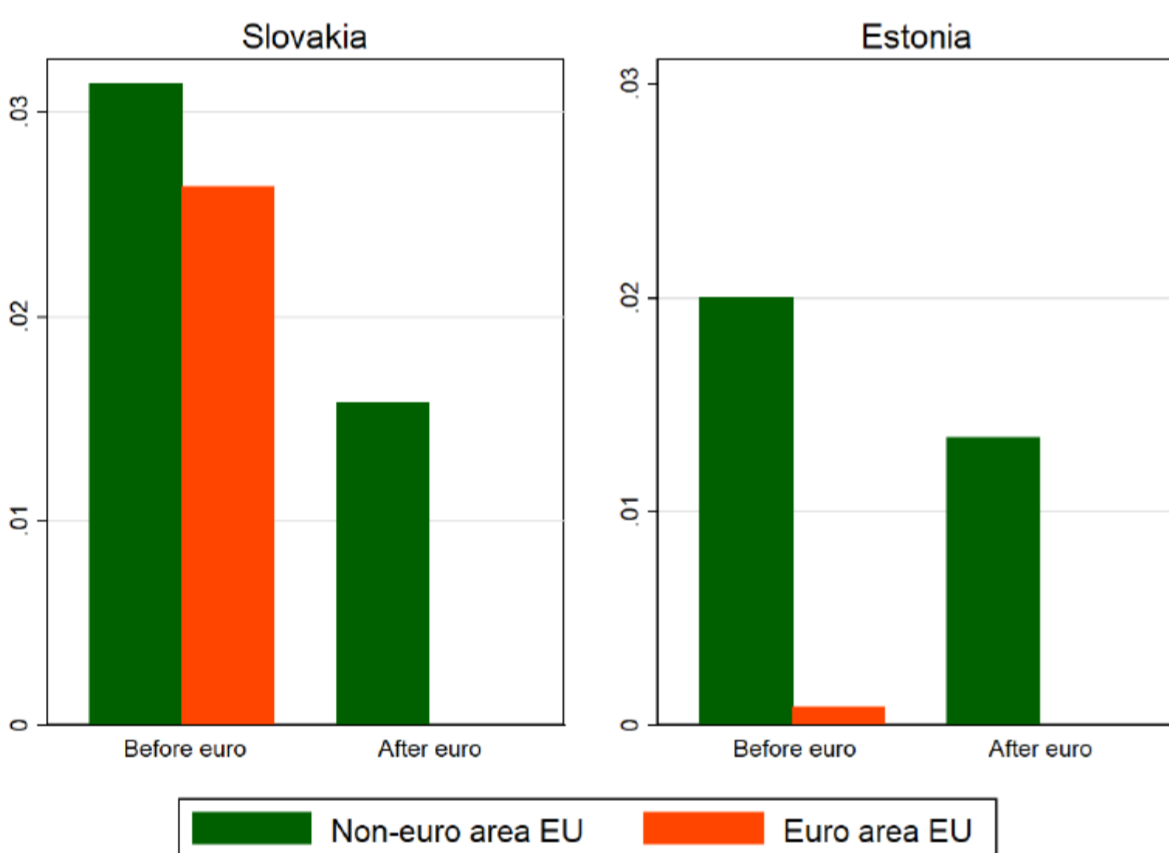
Note: Unweighted average of coefficient of variation of monthly bilateral exchange rates between origin and partner countries.
Source: Authors' calculations based on Eurostat.

We use detailed firm-level trade and balance sheet data for Slovakia and Estonia. We employ customs data on all exporting firms located in Slovakia and Estonia covering the HS6 codes for products, the ISO codes for destination countries and the FOB values of the export flows. In order to study differences in exporters' characteristics we merge the customs data with business register data and firm-level balance sheet data. The balance sheet data is harmonized across countries using approach originating from CompNet microdata project (see Lopez-Garcia et al. (2014) for definitions and outlier treatments).

Our methodology

We follow Berthou and Fontagne (2013), but in addition to their approach we introduce a dynamic specification where the persistence of export margin is controlled for. We also introduce industry-specific time trends and *firm×destination×product* fixed effects. The euro effect is identified by a difference in differences style dummy variable equal to one during the period following the euro adoption if the destination country was a member of the euro area, and zero otherwise ($Post_t \times EA_{ij}$). In the baseline specification, we compare exports to the euro area countries with exports to the remaining non-euro area EU countries. Only manufacturing firms are used in estimations as these are responsible for the majority of trade in goods.

The following dynamic specification is applied:

$$TM_{ijt} = \alpha_{ij} + \beta_1 TM_{ijt-1} + \beta_2\, Post_t \times EA_{ij} + \beta_3 \log(TFP_{ijt-1}) + \beta_4 \log(\text{GDP}_{jt}) + \beta_5 \log(\text{REER}_{jt}) + \beta_6 \log(\text{MP}_{jt}) + \tau_t \times sector_k + e_{ijt}$$

where i denotes the firm, j is the destination country, t is year and k industry. The dependent variable *Trade Margin* (TM_{ijt}) takes value of binary variable (equal to 1 if firm export, and 0 otherwise), number of products exported n_{ijt}, average value of export $\overline{x}_{ijt}$, and total export X_{ijt} in logarithms. The difference in differences effect of euro adoption is captured by the coefficient β_2.

Our results

Our results show positive trade effect of euro across all margins for Slovakia, but only for the probability to export in case of Estonia. The euro increased probability to export into euro area destination market by 1.5% in Slovakia and 3.7% in Estonia. These effects are in line with previous findings. For total export, we find statistically significant and strong economic impact of the euro adoption in Slovakia, but no effect in Estonia. The euro increased Slovakian manufacturing export by almost 20% and the intensive margin dominated the effect. The main reason for large effect in Slovakia is that this country benefited strongly along all the channels with potential positive gain, while it did not face increased competition from other countries.

Table 1. Euro effect on firm-level exports, Slovakia 2006-2011, manufacturing firms, within group estimation

	Export decision in each destination	Export decision in each destination× product	Number of products per destination, N_{jt}	Average export value per product in destination, $\overline{x}_{ijt}$	Total export per destination, X_{ijt}
Lagged dependent	0.027***	0.036***	0.122***	0.141***	0.174***
	(0.005)	(0.002)	(0.009)	(0.012)	(0.012)
Post_t×EA_j	0.015**	0.018***	0.033**	0.148***	0.180***
	(0.006)	(0.002)	(0.014)	(0.035)	(0.038)
Log(TFP_{jt-1})	0.0003	0.006***	0.007	0.051*	0.049
	(0.004)	(0.002)	(0.010)	(0.028)	(0.031)
Log(GDP_{jt})	0.179***	0.065***	0.116	0.818***	0.890***
	(0.036)	(0.015)	(0.089)	(0.230)	(0.251)
Log(MP_{jt})	0.126**	0.032	0.052	-0.866***	-0.812***
	(0.051)	(0.021)	(0.117)	(0.291)	(0.311)
Log(REER_{jt})	-0.177***	-0.079***	-0.161	-1.002***	-1.119***
	(0.051)	(0.021)	(0.119)	(0.302)	(0.329)
Year×sector FE	Yes	Yes	Yes	Yes	Yes
Firm×destination FE	Yes	No	Yes	Yes	Yes
Firm×destination×product FE	No	Yes	No	No	No
Observations	95,987	660,953	35,599	35,595	35,595
No of objects	22,885	148,813	11,446	11,445	11,445
Within R²	0.015	0.009	0.040	0.067	0.081

Note: Significance levels *10%, **5%, ***1%. Clustered standard errors in parenthesis.
Source: Authors calculations from Business Register and Customs data.

Table 2. Euro effect on firm-level exports, Estonia 2008-2013, manufacturing, within group estimation

	Export decision in each destination	Export decision in each destination× product	Number of products per destination, N_{jt}	Average export value per product in destination, $\overline{x}_{ijt}$	Total export per destination, X_{ijt}
Lagged dependent	0.094***	0.062***	0.181***	0.182***	0.203***
	(0.013)	(0.005)	(0.025)	(0.025)	(0.026)
Post_t×EA_j	0.037**	0.012	0.011	-0.048	-0.043
	(0.019)	(0.009)	(0.034)	(0.078)	(0.081)
Log(TFP_{jt-1})	-0.007	-0.002	-0.017	0.061	0.041
	(0.009)	(0.005)	(0.016)	(0.042)	(0.044)
Log(GDP_{jt})	-0.065	-0.042	0.191	1.550***	1.720***
	(0.090)	(0.044)	(0.155)	(0.424)	(0.425)
Log(MP_{jt})	0.313**	0.271***	0.326	-1.017	-0.677
	(0.156)	(0.079)	(0.309)	(0.714)	(0.722)
Log(REER_{jt})	0.456***	0.302***	0.270	-2.126**	-1.839**
	(0.174)	(0.087)	(0.339)	(0.842)	(0.863)
Year×sector FE	Yes	Yes	Yes	Yes	Yes
Firm×destination FE	Yes	No	Yes	Yes	Yes
Firm×destination×product FE	No	Yes	No	No	No
Observations	12898	75547	6311	6311	6311
No of objects	3792	22701	2393	2393	2393
Within R²	0.044	0.033	0.105	0.100	0.119

Note: Significance levels *10%, **5%, ***1%. Clustered standard errors in parenthesis.
Source: Authors calculations from Business Register and Customs data.

We test whether the effects have been heterogeneous over various firm characteristics (productivity, size, age, ownership or indebtedness). Although, we find that the most productive firms gained the most, our results indicate that the gains from euro adoption were more equally distributed than in previous studies. We apply several robustness tests and find that the overall effect is stronger for scale intensive and supplier dominated industries and intermediate goods exporters.

Figure 2. The effect of euro across product groups and Pavitt's industries, Slovakia 2006-2011, manufacturing firms
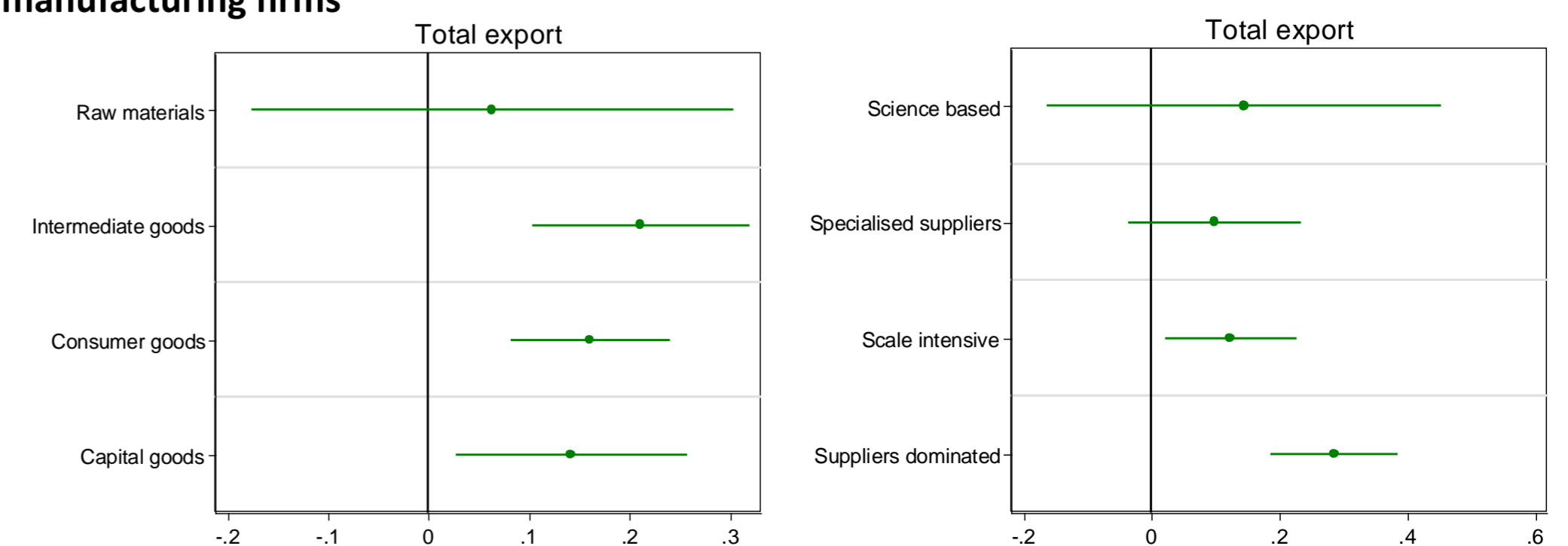
Note: The confidence intervals reflect statistical significance at 10%. Source: Authors' calculations based on micro data.