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Cost of Trade Impacts on Transition Country Exports

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Introduction

The correlation between a country's export performance and the growth rate of economy has been an important point of research for many years. Based on the mercantilist doctrine, increased exports lead to an additional capital inflow to the country which can be further used for expansion of exports. This economic notion is considered as a foundation for the well-known export-led growth hypothesis (ELGH). According to the supporters of this hypothesis, positive externalities of exports can be important determinants of growth in a country. Evidence for this perspective can be observed in the studies of (Krueger,1979), (Michalapolous and Joy 1975), Helpman and Krugman/1985).

The economic growth of the 'Asian Tigers' is an oft cited example where a strong export orientation resulted in rapid and significant economic growth. Increased production of technology-intensive and innovative products fostered the rate of economic development in the region to a considerable degree. Export-led growth can also result from development of natural resources. Resource rich transition countries, like Azerbaijan and Kazakhstan, provide examples of this. Although economic growth rates differ between countries, a positive relationship between exports and economic development is common. On the other hand, countries with "import substitution" strategies have shown less satisfactory growth performance of economy (Krueger, 1979).

A rich literature analyzing differences in the economic progress of transition economies since the early 1990's has developed, including some studies of differences in the trade performance of transition economies. These studies often focus on early year differences in privatization, economic and legal policies and examine how these differences have affected economic growth since then. Differences in growth rates of GDP and trade in transition economies continue to be observed in recent years however, many years after the initial transition policies were put in place. The differences are clear in Table 1 which shows export and GDP data for 2005-through 2011.

Table 1 shows that average annual export growth from the 2005-2007 base to 2009-2011 ranged from 12 percent to 105 percent for the included transition countries. The largest percentage increases were for resource (mainly oil) rich countries or countries with very low levels of exports in the base period.

In contrast to many previous studies of transition economies, which often emphasized economic performance differences related to early transition policies, we focus on recent differences in export performance of transition countries. We use recent research on trade facilitation policies and new data on export costs to examine the effect of internal export costs on the exports of transition countries. Our focus is on growth in exports rather than growth in GDP, but we are partially motivated by the relationship between the two.

Export Models

In this section we will first discuss traditional export models. We also briefly discuss literature on bilateral trade growth, which apply gravity techniques to the analysis of trade performance. Finally we discuss recent trade facilitation literature which is concerned with policies designed to encourage trade and articles focused specifically on exports of transition countries.

Khan (1974) estimated the impact of relative prices in determining exports and concluded that the prices do play the important role in determination of export performance of developing countries¹. Econometric model specifications that Khan used in his estimation were very widely applied in the further literature:

Export Demand:

$$\ln X_{it} = \beta_0 + \beta_1 (\ln PX_{it} - \ln PW_t) + \beta_2 \ln YW_t + \varepsilon_{it}$$

¹By this work, Khan (1974) confirmed that “Marshall-Lerner condition for successful devaluation would be easily satisfied” for developing countries.

Export Supply:

$$\ln X_{it} = \beta_0 + \beta_1 \ln PX_{it} + \beta_2 \ln PD_{it} + \beta_3 \ln Y_{it} + \varepsilon_{it},$$

where X_i quantity of exports of country i , PX_i is the unit value of exports of country i , PW_i is world price level, W is the real world income and Y_i is the the real income of country i .

Warner and Kreinin (1983) is an important contribution to the literature on foreign trade modeling for industrialized countries. Even though the basic structure of this work is similar to Khan (1974), two main dissimilarities should be mentioned. Firstly, they investigate two distinctive time periods with fixed and flexible exchange rate regimes, and secondly, they estimated the import model with and without petroleum products. According to the results of Warner and Kreinin, exchange rates and the prices of exports in competing countries should be considered as important determinants of exports.

Redding and Venables (2003), and later Fugazza's (2004) studies measure the effect of external market access and internal supply capacity on export performance. Using quantile regression techniques, Fugazza estimated the impact of foreign market access and internal supply-side characteristics on the export performance of a country. He estimated exports as a function of GDP, population, internal transportation costs, a competitiveness index, and an constructed variable used as a proxy for foreign market access.

Fugazza emphasized the importance of supply-side conditions on export performance, particularly in Africa and the Middle East. He also found that internal infrastructure and quality institutions along with international market access can be considered key determinants of export development.

Trade Facilitation Literature

A recent topic in the export literature is the study of the impact of trade facilitation policies on export performance. These studies mainly differ from traditional export growth models by estimating

the impact of specific trade, economic or political reform policies on the country's export performance. 'Trade facilitation' has mainly been defined as increasing the quality of the processes that leads commodities to be exported/imported and transactions to take place within a shorter time period and more efficiently.

Analysis and quantitative techniques used in the works of McCalum (1995), Obstfeld and Rogoff (2001), Iwanow and Kirkpatrick (2007), Wilson, Mann and Otsuki (WMO) (2004) are significant contributions in trade facilitation studies. Most of these works apply a common methodological approach that measures export performance with respect to trade costs based on the Tinbergen's (1962) model.

The study by Iwanow and Kirkpatrick (2007) estimates the impact of trade facilitation reforms, infrastructure, and quality of reforms indicators on export performance. This work applies a standard gravity model in the estimation process with panel data from 2000 to 2004 for 78 countries. They construct a trade facilitation variable from data on hidden export barriers and irregular payments in exports and imports. They also construct an aggregate index of trade facilitation using the components of World Bank's Doing Business Indicators. They conclude that positive impacts of trade facilitation reform do exist; however, transportation, communication and quality of internal reforms are no less important.

The relationship between trade facilitation and trade flows across 75 countries during 2000 and 2001 was estimated and analyzed by Wilson, Mann, Otsuki (2004). This work takes into account the importance of four categories on trade flows: port efficiency, customs environment, regulatory environment, and service sector infrastructure. All four factors were positive and statistically significant in trade-flow estimation.

Allen Denis and Ben (2007) estimated the impact of cost of exporting, domestic market entry and international transport cost on export diversification in developing countries. Relatively new data from the World Bank's Doing Business Database was used in this study which and cross-sectional analysis of a single year 2005 has been implemented. Their estimation was based on a set of 118 countries, and they estimated that decreases in the cost of exporting or international transport cost can result in increased export diversification. They also concluded that lower domestic market entry costs can enhance export diversification.

Exports of Transition Economies

Among the studies on export performance in transition countries the most prominent is Kaminski, Wang and Winters (1995). In their study of export performance of transition economies of Europe and Central Asia, they conclude the early transition implementation of stabilization and liberalization reforms had a positive effect on the country's export performance. This study emphasizes the necessity of removing export controls over import controls in the short-run, however in the long-run "open import regime, realistic exchange rate and privatization are necessary to assure the efficient transmission of market signals and sustained growth". Kaminski explains export performance of transitions as a function of exogenous determinants (initial condition, geography and market access), macroeconomic policy and trade policy reforms. An important conclusion of this study is that macroeconomic stabilization and price liberalization which is associated with the removal of export controls, can lead transition country's export performance to improvement.

Damijan, Rojec and Ferjancic (2008) studied export performance of CEEC and certain EU member transition economies from 1994-2004. By applying a gravity model and following the empirical approach of Redding and Venables (2003, 2004), and Fugaza (2004) this work estimated the effects of foreign/EU market access and internal supply capacity on export performance. According to their

results, contribution of foreign market access and supply capacity to the export performance for CEEC-8 and CEEC-3 countries is almost identical. The importance of FDI in creating economic potential for future export growth is another important conclusion of the study.

Besedes (2010) investigated structural variation of trade in 17 transition economies from 1996 to 2006. Besedes considered three types of products: homogenous goods, reference priced goods and differentiated goods in the country's exports. He estimated export shares of each type of good and intensive and extensive margins. Most countries increased the share of differentiated goods in exports during this time-period, however a few increased the share of homogenous goods. Larger economies tended to increase the number of countries they export to, while richer economies increased the amount of products, especially in homogenous and reference priced goods.

Our model:

Our empirical model combines elements of general export models, trade facilitation models, and transition country specific trade models. We follow Redding and Venables (2003) and Fugazza (2004) in emphasizing that exports depend on determinants of supply capacity for exportable goods and factors affecting foreign market access for a country.

A new element of our model of transition countries is the inclusion of an export cost variable. ExportCost includes costs (in \$US) for documents, administrative fees for custom clearance and technical control, terminal handling charges, and internal transport fees for handling and transporting a 20-foot container to the port of departure ("Trading Across Border" part of World Bank's "Doing Business Indicators").

Our empirical model includes a panel of the 28 transition countries listed in *Table 1* for the years 2005 through 2011. The data period goes back only to 2005 based on the availability of the Export

Cost variable. We used Generalized Method of Moments (GMM) and GMM Instrumental Variables techniques for the estimation.

We started with a simple base version of the model and then added new variables to assess their impacts.

The base model was:

$$\ln(EX_{it}) = \beta_0 + \beta_1 \ln(GDP_{it-1}) + \beta_2 \ln(POP_{it}) + \beta_3 \ln(NatRes_{it}) + \varphi Distance_i + \varepsilon_{it}$$

EX_{it} represents exports of country i at time t . GDP_{it-1} denotes lagged gross domestic product², and POP_{it} represents country i 's population. Both of these variables are related to export supply capacity with GDP representing the economic size of the country and POP serves as a control for domestic demand and they are expected to have positive and negative impact respectively. $NatRes_{it}$ controls for the natural resource endowments (total natural resource rents as a % of GDP) in the country and is considered an important supply capacity determinant and a positive impact on exports is expected for higher values of this variable. $Distance_i$ is a foreign market access determinant in the model and measures the natural log of distance for each country to the major export markets (in our model Germany, China or Russia) and serves as a proxy for transportation cost, and ε_{it} is the error terms. We expect distance to have a negative impact on exports.

For CEE and FSU countries located on the European side of the Caspian Sea and Ural Mountains we consider the European Union as the major export market. For these countries transportation cost

² GDP has been included in the lagged form with the purpose of avoiding endogeneity issue. The same will apply to the Foreign Direct Investment further in the model.

covers the distance from the country to the ‘Middle of Europe’³. Central Asian countries mostly trade with China and Russia, thus, for these countries we use the distance to China or Russia.

Initial additions to the base model were the macroeconomic variables $REER_{it}$ which is the real effective exchange rate (a proxy for relative prices (2007=100)) and FDI_{it-1} which is lagged Foreign Direct Investment inflows. We lagged FDI to help avoid endogeneity. We expect REER to have a negative impact on exports as the home currency gets stronger and FDI to have positive impacts on export growth. As argued in previous studies (UNCTAD, 1995, 2002, Fugazza, 2004), FDI is expected to increase country’s competitiveness on foreign markets either by contributing to production capacity or by enhancing relationships with the FDI source country.

The next specifications add a Competition and/or Economic Freedom variable to the model. The Competition variable is an index from European Bank of Reconstruction and Development (EBRD) that combines several measures of policies that impact the competitive business environment of a country. This index ranges from 1 (little policy improvement toward increasing competitiveness) to 4 (representing the norms of industrialized market economy). As an alternative to the Competition variable we used the Index of Economic Freedom from the Heritage Foundation. This index is similar to the Competition variable in terms of attempting to account for differences in internal market efficiencies in a country but is less correlated with other exogenous variables in the model. Both indices are expected to have positive impacts on exports.

The final specifications add the Export Cost variable to the models. As discussed earlier this variable measures fees for exporting a 20 foot container from each country. Higher export costs are expected to negatively impact exports from a country. We were concerned about endogeneity of Export Costs with the level of exports so we followed Djankov (2006) and used an instrumental

³ As the middle of Europe we consider Frankfurt

variable approach to include Export Cost in the model. Following Djankov we used export costs in neighboring countries as an instrument for Export Cost. We also included an interaction term between Export Costs and a dummy variable that had a value of 1 for countries without a common border with the EU to account for the possibility that export cost might differ for countries closest to the European markets.

The most comprehensive model estimated was:

$$\ln(EX_{it}) = \beta_0 + \beta_1 \ln(GDP_{it-1}) + \beta_2 \ln(POP_{it}) + \beta_3 \ln(NatRes_{it}) + \beta_4 \ln(Distance_{it}) + \beta_5 \ln(REER_{it}) + \beta_6 \ln(FDI_{it-1}) + \beta_7 ExportCost_{it} + \beta_8 ExportCost_{it} * D_{nonEU} + \beta_9 EconFreedom_{it} + \varepsilon_{it}$$

$$ExportCost_{it} = \eta Z_{it} + v_{it}$$

Where Z_{it} is the average Export Costs for countries adjacent to country i . We employ data from multiple sources. ‘Export Cost’ comes from World Bank’s “Doing Business Indicators”. Export data comes from United Nation’s COMTRADE database, distances are from <http://www.indo.com/distance/>, language and other bilateral data are from the GeoDist datasets of Institute for Research on the International Economy (CEPII). *Table 2* presents a summary of the main variables used in the study.

Model Results:

Results for various specifications are presented in Table 3 and Table 4. Table 3 includes all 28 countries listed in Table 1, and Table 4 excludes five “resource rich” countries (Russia, Kazakhstan, Azerbaijan, Uzbekistan, and Mongolia) where the annual natural resource value of production represents more than 40% of GDP. We estimate both groups of countries since the presence of large quantities of natural resources available for export could have effects on exports that can’t be accounted for by other variables in the model.

The “all country” estimation results reported in Table 3 will be discussed first. When all countries are included in the estimation, coefficients for the lagged GDP and Natural Resources variables are consistent and robust across all 7 specifications and they indicate positive and statistically significant effects on exports for these variables. Transition countries with larger economies and greater endowments of natural resources tend to export more. Coefficients for distance from major markets were negative, significant, and of similar magnitude across all specifications reflecting the export depressing impact of higher transportation costs. Lagged foreign direct investment was included in 5 of the specifications and the coefficients were positive, significant, and of approximately the same magnitude across all of them. Both measures of economic competitiveness were significant and positive in the specifications which included them, although the impact of these variables appears to be rather small. Export costs were insignificant for EU adjacent countries but the coefficient for the interaction between Export Costs and the dummy for non-EU adjacency was significant, indicating that higher export fees had a negative but small impact on exports from the non-EU subset of transition economies. Finally, the population coefficient was negative and significant in 3 of the 7 specifications indicating a lack of robustness and the real exchange rate coefficient was insignificant across all specifications.

The estimation results when the 5 “resource rich” countries are excluded are similar to those for all countries with a few exceptions. The GDP coefficients remain positive and significant across all specifications but the magnitude of the coefficients increases somewhat with the smaller number of countries. The natural resource coefficients remain positive and significant for 5 of the 6 specifications for the smaller group of countries but their magnitudes are about 1/3 smaller than estimates for the full set of countries. The coefficient estimates for foreign direct investment were the most changed by excluding resource rich countries, becoming smaller and less significant for the estimates without

resource rich countries. This could be due to higher FDI spending for resource development in the resource rich countries being related to higher levels of exports from the greater availability of natural resources to export. Results for the Export Cost variable were almost identical for the two country groups with a small negative impact associated with higher Export Costs for non-EU adjacent countries.

Conclusions and Policy Implications

Much attention has been given to studying the economic performance of former Soviet Union and Eastern European transition economies and much of the focus of those studies has been on the economic impacts of early transition policy differences. Recent data indicates that major economic differences among transition countries continue to exist including significant differences between countries in export growth since 2005. In this study we used annual export data for 28 transition countries for the years 2005 through 2011 to attempt to identify sources of these differences in export performance. We had a particular interest in the impact of differences in export fees on exports of transition countries. Export cost data has only recently become available and there has been little empirical research on the impacts of these costs.

Our findings were generally consistent with theory and previous findings where the size of the economy and distance from markets have strong influences on exports. Among these transition countries we found major positive impacts on exports from greater availability of natural resources. Our results also suggest that FDI has a greater positive impact on exports for natural resources abundant countries. Export fees appeared to have no impact on exports from transition countries with the exception of a small negative impact on exports from countries that are not adjacent to any EU country.

Distance from markets and natural resource endowments are two export determinants that are beyond the control of any country. In contrast, government policies related to a competitive business environment and export costs can be changed in an effort to increase exports and economic growth. This is the motivation for the recent trade facilitation literature and for our interest in recent year export performance of transition countries and the impacts of export costs (fees) on exports.

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Table 1. GDP and Export Growth for Selected Transition Countries 2005-07 to 2009-11

Location ¹		Average GDP 2009-11 ²	Average Exports 2009-2011 ²	Exp/GDP	% Change GDP from 2005-07 ³	% Change Exports from 2005-07 ³	Change in Exp/GDP from 2005-07
Non-Former Soviet Union Countries							
<i>CE</i>	Poland	473.8	200.0	0.42	33	42	0.03
<i>CE</i>	Czech Rep.	209.5	137.5	0.65	37	35	0.02
<i>CE/Balkan</i>	Romania	167.5	43.9	0.26	29	12	-0.05
<i>CE</i>	Hungary	135.7	112.9	0.83	15	25	0.07
<i>CE</i>	Slovakia	91.1	72.7	0.81	28	23	0.03
<i>Balkan</i>	Croatia	62.7	23.4	0.37	33	17	-0.08
<i>Balkan</i>	Slovenia	52.5	32.9	0.63	29	22	0.02
<i>Balkan</i>	Bulgaria	49.9	28.1	0.59	44	47	0.02
<i>Balkan</i>	Serbia	41.1	13.9	0.34	32	53	0.05
<i>Balkan</i>	Boznia and Herzegovina	17.2	6.3	0.37	33	29	-0.01
<i>Balkan</i>	Albania	12.3	3.6	0.29	31	50	0.04
<i>Balkan</i>	Macedonia, FYR	9.5	4.3	0.45	38	30	0.03
<i>Balkan</i>	Montenegro	4.3	1.5	0.35	48	25	-0.07
Former Soviet Union Countries							
<i>Eur CIS</i>	Russia	1522.6	436.1	0.29	50	31	-0.05
<i>Eur CIS</i>	Ukraine	139.6	70.1	0.50	23	32	0.03
<i>CA</i>	Kazakhstan	149.5	63.8	0.43	85	54	-0.08
<i>TC</i>	Azerbaijan	53.5	30.4	0.57	138	105	-0.11
<i>Eur CIS</i>	Belarus	53.2	30.7	0.58	41	36	-0.03
<i>Baltic</i>	Lithuania	41.6	26.1	0.63	51	45	0.06
<i>CA</i>	Uzbekistan	39.1	12.8	0.33	118	85	-0.05
<i>Baltic</i>	Latvia	28.1	13.8	0.49	55	44	0.07
<i>Baltic</i>	Estonia	20.6	16	0.78	20	27	0.07
<i>TC</i>	Georgia	12.2	4.1	0.34	50	57	0.01
<i>TC</i>	Armenia	9.4	1.9	0.20	38	18	-0.03
<i>CA</i>	Mongolia	6.4	3.7	0.58	80	76	-0.03
<i>Eur CIS</i>	Moldova	6.1	2.5	0.41	38	47	-0.06
<i>CA</i>	Tajikistan	5.7	0.9	0.16	90	29	-0.08
<i>CA</i>	Kyrgyzstan	5.1	2.8	0.55	65	90	0.09
<p>CE – Central Europe; BA – Balkan, Eur CIS – European Commonwealth of Independent States; TC – Transcaucasia; CA – Central Asia.</p> <p>² Current USD (billions).</p> <p>³ Percentage change from 2005 - 2007 average to 2009- 2011 average</p> <p>Natural Resource rich countries are in bold</p> <p>Source: Export Data is from UN Comtrade database and GDP data is from World Bank's Database</p>							

Table 2. Summary Statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
Ln(exports)	196	23.36969	1.621212	20.21465	26.9771
Ln(GDP)	196	24.05956	1.510301	21.41244	28.13835
Ln(population)	196	15.67486	1.145835	13.34829	18.7794
Ln(NatRes)	195	24.79911	2.385198	17.99325	31.5322
ln(REER)	196	4.612802	.0882044	4.20783	4.869431
ln(FDI)	191	25.51046	2.490259	21.17991	29.64596
ExportCost	196	7.213775	.4905276	6.214608	8.362876
Distance	196	7.34176	.5510325	6.300786	8.345693
EconFreedom	196	60.61786	7.342775	45	78
Competition	196	2.485918	.6519279	1	3.67

Table 3. Estimation Results – All CountriesDependent Variable: $\ln(\text{Exports})$

VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)	(7)
$\ln(\text{GDP}_{t-1})$	0.963*** (0.043)	0.738*** (0.062)	0.635*** (0.061)	0.708*** (0.064)	0.752*** (0.069)	0.731*** (0.073)	0.919*** (0.052)
$\ln(\text{Population})$	-0.155*** (0.049)	-0.079 (0.054)	0.007 (0.052)	-0.016 (0.062)	-0.101* (0.061)	-0.044 (0.064)	-0.161*** (0.055)
$\ln(\text{NatRes})$	0.111*** (0.023)	0.125*** (0.022)	0.143*** (0.021)	0.131*** (0.022)	0.121*** (0.021)	0.124*** (0.019)	0.127*** (0.021)
$\ln(\text{REER})$	-	0.605 (0.378)	0.453 (0.351)	0.618 (0.376)	0.535 (0.361)	0.474 (0.364)	0.092 (0.371)
$\text{lag}(\text{FDI})$	-	0.202*** (0.047)	0.171*** (0.044)	0.188*** (0.047)	0.207*** (0.047)	0.193*** (0.048)	-
Competition	-	-	0.324*** (0.061)	-	-	-	-
EconFreedom	-	-	-	0.011** (0.005)	-	0.012** (0.005)	-
$\text{ExportCost} * D_{\text{nonEU}}$	-	-	-	-	-	-	-0.031*** (0.011)
ExportCost	-	-	-	-	0.083 (0.139)	0.176 (0.152)	0.087 (0.147)
Distance	-0.303*** (0.078)	-0.336*** (0.077)	-0.306*** (0.072)	-0.384*** (0.081)	-0.361*** (0.088)	-0.448*** (0.098)	-0.286*** (0.091)
Constant	2.097** (0.879)	-1.562 (1.971)	-0.418 (1.835)	-1.918 (1.961)	-1.664 (1.763)	-2.228 (1.797)	1.717 (1.711)
Observations	195	167	167	167	167	167	167
R-squared	0.943	0.953	0.960	0.954	-	-	-
Root MSE	-	-	-	-	0.349	0.341	0.361

Standard errors in parentheses
 *** p<0.01, ** p<0.05, * p<0.1

Table 4. Estimation Results Non-Resource Rich Countries

Dependent Variable: $\ln(\text{Exports})$						
VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)
$\ln(\text{GDP}_{t-1})$	1.023*** (0.064)	0.853*** (0.083)	0.799*** (0.095)	0.854*** (0.085)	0.796*** (0.091)	0.937*** (0.073)
$\ln(\text{Population})$	-0.091 (0.058)	-0.062 (0.061)	0.084 (0.079)	-0.074 (0.087)	0.038 (0.087)	-0.046 (0.069)
$\ln(\text{NatRes})$	0.044 (0.036)	0.088** (0.036)	0.093** (0.032)	0.091** (0.037)	0.105*** (0.032)	0.057* (0.032)
$\ln(\text{REER})$	-	0.687 (0.458)	0.665 (0.431)	0.672 (0.428)	0.584 (0.419)	0.472 (0.441)
$\ln(\text{FDI}_{t-1})$	-	0.126** (0.063)	0.041 (0.068)	0.132* (0.072)	0.061 (0.071)	-
EconFreedom	-	-	0.018*** (0.006)	-	0.201*** (0.006)	-
ExportCost*D _{nonEU}	-	-	-	-	-	-0.036*** (0.012)
ExportCost	-	-	-	0.036 (0.201)	0.188 (0.195)	-0.015 (0.169)
Distance	-0.334*** (0.109)	-0.349*** (0.118)	-0.584*** (0.161)	-0.355*** (0.138)	-0.639*** (0.173)	-0.304** (0.133)
Constant	1.479 (1.365)	-2.111 (2.606)	-0.363 (2.781)	--2.285 (2.808)	-1.083 (2.774)	0.265 (2.205)
Observations	160	137	137	137	137	137
R-squared	0.940	0.945	0.948	-	-	-
Hansen J	-	-	-	0.000	0.000	0.000
Root MSE				0.365	0.352	0.363

Standard errors in parentheses

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