

THE IMPACT OF THE COMPONENTS OF TRADE COSTS ON EXPORT GROWTH: AN EMPIRICAL MEASUREMENT

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Introduction

The well-known hypothesis of Obstfeld and Rogoff (2000) is that trade costs are the key to explaining all the major puzzles of international macroeconomics. McCallum's (1995) analysis of the 'border puzzle', which concerns large unexplained trade costs incurred in the process of goods crossing over a national border, has raised several questions about trade costs and their empirical measurements. He finds that 'beyond the border' trade costs are higher than 'behind the border' trade costs even for countries that are highly integrated through the North American Free Trade Agreement (NAFTA). Anderson and van Wincoop (2003) attempted to solve the 'border puzzle' using McCallum's data in a gravity model framework. They have modeled bilateral resistance between USA and Canada as a function of distance and tariff equivalent of border costs between the countries, and thereby have calculated the multilateral resistance factors to be included in the gravity model.

With their specification, they were able to explain a significant size of the border puzzle. For example, McCallum (1995) found trade between USA and Canada was lower than trade within the borders of Canada by 2,200 per cent, but Anderson and van Wincoop (2003) with their specification of the gravity model reduced McCallum's unexplained border effect to 44 per cent. However, researchers have argued that the Anderson and van Wincoop analysis has a number of limitations. To mention a few, the OLS estimation of the log linearized gravity model would lead to biased estimates in the presence of heteroskedasticity (Silva and Tenreyro 2006) or in case of observations with no trade between countries (Silva and Tenreyro 2006, Westerlund and Wilhelmsson 2006). Also, recently, Balisteri and Hillberry (2007) noted that the assumption of symmetric trade costs by Anderson and van Wincoop (2003) to solve their model is unrealistic and concluded that the literature still cannot explain the border puzzle fully. Anderson and van Wincoop (2004) also commented that it is very difficult to understand and measure the real costs involved in trade between countries. The interesting question is: When the researcher does not have full information on all components of trade costs, is it possible to measure the influence of trade costs on trade?

It is in this context, following Kalirajan (2007), an alternative method of measuring the impact of trade costs on the realized exports from home country to different partner countries, when the researcher does not have full information on all cost affecting resistance factors in and out of the exporting country, is suggested. Also, it is realistic to assume that these components of trade costs would be changing over time. Building on from Kalirajan and Khan (2007), the impact of changes in these components of trade costs on Pakistan's export growth has been estimated separately for each of its trading partner in this paper.

Methodology

The estimation of the gravity model using OLS may lead to biased estimates due to the omission of country specific effects in the model. The use of fixed effects model is not feasible in case of long panels, while the GLS estimates to overcome heteroskedasticity of the error term results in biased estimates due to log linearization of the gravity model. Following Kalirajan (2007), in the absence of complete information on all the components of trade costs in home and partner countries, the gravity equation can be estimated using the modeling and estimation methods developed by Aigner, Lovell, and Schmidt (1977) and Meeusen and van den Broeck (1977) for stochastic frontier production functions is as follows:

$$\ln Ex_{ij} = B_0 + B_1 \ln Pop_j + B_2 \ln GDPPC_j + B_3 \ln Dist_j + B_4 \ln(1+T_{j,i}) + B_5 \ln RER_{i,j} - u_j + v_j \quad (2)$$

The equation (2) is estimated for each period under study separately using the computer software STATA 9.0. Once the estimation results for the two periods are available, the change in exports of home country to each of its partner countries between those two periods can be decomposed into changes due to variations in ‘natural’ transport costs; ‘behind the border’ costs; ‘explicit beyond the border’ costs; and ‘implicit beyond the border’ costs, using the procedure proposed by Kalirajan and Khan (2007), which is briefly explained as under.

The total exports growth can, thus, be decomposed into the sum of changes in demand and ‘explicit beyond the border’ trade costs in importing country, changes in ‘implicit beyond the border’ trade costs in importing countries, and changes in ‘behind the border’ trade costs in home country over time as follows (see Figure1).

Results

The sources of export growth of Pakistan during 1999-2004 have been identified. The results show that Pakistan’s exports to some of its partner countries grew mainly due to reduction in both ‘explicit and implicit beyond the border’ trade costs and due to increased demand in partner countries between 1999 and 2004. On the other hand, ‘behind the border’ trade costs within Pakistan have led to larger export losses in 2004 particularly with respect to China and India. The focus of the trade policy should be faster and more effective domestic reforms, investment in trade infrastructure and institutions, training and streamlining of exporters and manufacturers, establishment of closer trade ties with the importers through Pakistan’s Missions abroad. Particularly needed are comprehensive market studies for China and India, and providing an enabling environment for the growth of the sectors in Pakistan for which the demand is growing faster in China and India.

Table 1: Top 10 countries in terms of export losses in 1999 (in US\$)

Countries	Export losses
Austria	130964303
Spain	175954246
Switzerland	193300278
Turkey	296772697
France	324241880
Germany	337403300
Italy	374926408
India	618665342
China	712618939
Japan	717585620

Table 2: Top 10 countries in terms of export losses in 2004 (in US\$)

Countries	Export losses
Spain	221076092
Poland	227142342
Brazil	278736990
Turkey	280775722
Italy	364182630
France	557705978
Germany	595608024
Japan	985592113
India	2120290392
China	2425978345

Table 3: Top 10 countries with respect to Pakistan's Export Gains and Losses, 1999-2004

Countries	Change	Countries	Change
Turkey	15996975	China	-1713359406
Belgium	17180958	India	-1501625050
Netherlands	24381584	Japan	-268006493
Kenya	35483257	Germany	-258204724
South Africa Customs Union	43277106	France	-233464098
United Kingdom	56024070	Brazil	-149042572
Iran	72627184	Canada	-121906122
Hong Kong	97876027	Indonesia	-107502408
Nigeria	236912036	Poland	-104253744
USA	250298981	Egypt	-86309206

Note: Positive sign shows reduction in losses/additional exports during the two periods; and the negative sign shows the increase in losses.

Table 4: Impact of Changes in ‘Implicit Beyond the Border Constraints’ (Top 10 countries) during 1999-2004 on Pakistan’s Export Potentials

Countries	Gain	Countries	Loss
Spain	76359230	Switzerland	-33888315
Turkey	113470694	Hong Kong	-30170735
Brazil	115772875	Norway	-3837860
Italy	143991160	Czech Rep.	-3223599
France	144282928	Estonia	-2825774
United Kingdom	157317072	Luxembourg	-1333228
Germany	220732670	Malta	-121409
USA	565960357	Maldives	-68449
China	716816186	New Zealand	-51478
India	1067980374		

Note: Negative sign shows reduction in export potential due to more restrictive trade environment facing Pakistan to these countries.

Table 5: Changes in Pakistan’s Exports due to the sum of changes in ‘natural’ determinants of trade and ‘explicit beyond the border constraints’ during 1999-2004 (Top 10 Countries)

Countries	Gain	Countries	Loss
Poland	75598146	Argentina	-34133504
Saudi Arabia	110430540	Iran	-28008347
Spain	144762616	Kenya	-5832815
Italy	166265062	Zimbabwe	-3916231
Germany	175472054	Georgia	-3451577
France	179181170	Uruguay	-2502218
United Kingdom	191658859	El Salvador	-2138310
USA	373740662	Venezuela	-1801404
China	1116543220	Honduras	-717086

Note: Positive (negative) sign shows increase (reduction) in exports.

Figure 1: Export Growth Decomposition

