Determinants of Barbados Exports: Preliminary Analysis using a Gravity Model Approach

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Abstract

Exports are important to the economic growth of Barbados. This study explores the factors that affect the merchandise exports of the country. Using a gravity model on 2005 data on 105 importing countries the paper shows that the flow of exports of Barbados are positively influenced by the GDP and GDP per capita of importing countries, participation in the Caribbean Community (CARICOM) which is a regional trade agreement, and countries that speak English. In contrast, the distance between Barbados and importing countries has a strong negative impact on exports. Other preferential market access arrangements Barbados enjoys, such as bilateral trade agreements and the Generalised System of Preferences, have insignificant effects on export flows. The model was also used to highlight markets with increased export potential for the country. It is expected the results of this application of the gravity model may particularly interest policymakers in Barbados.

Key words: gravity model, Barbados, export potential, cross-sectional data

JEL classifications: F10, F14

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1. Introduction

Empirical studies have broadly established that exports are positively linked to the economic growth of Barbados (see Greenidge and Peter, 1999; and Francis et al., 2007). Exports create employment opportunities and generate foreign exchange for the country. Regarding the latter, the foreign exchange earned from export activities is necessary to help finance the importation of raw, intermediate, and consumer goods into Barbados. The accumulation of this foreign exchange also helps the country maintain its pegged fixed exchange rate to the U.S dollar.

Although exports are important to the economy of Barbados, the country has no defined export strategy or plan. This was despite the national strategic goal of increasing domestic exports from the projected total of US $1,212.9 million in 2010, to US $1,579.7 million by the end of 2014, which did not occur.[1]

This writer argues that for Barbados to achieve any future national export targets, an extensive strategy for the country must be developed. For merchandise goods in particular, an export strategy for Barbados should identify: the goods the country is best suited to produce for export; the optimal markets the export sector should target as the production base of the country expands; and the appropriate mechanisms for delivery of the goods to export markets targeted.

This paper examines the second element of the proposed national export strategy for Barbados mentioned above. Specifically, the study identifies potential markets the export sector of Barbados should concentrate its efforts on, as it expands. This is achieved by investigating the factors that influence the export flows of the country through the use of a gravity model.

Gravity models have been used with great frequency in the economic literature to explain the determinants of trade flows. Particularly, investigations into the factors that influence the exports of countries have gained traction in recent years. A sample of the empirical work on export gravity models applied in both developed and developing countries is provided in Appendix 1.

Although the model has been used to analyse the trade flows of many countries until now the technique has not been employed to explain the export flows or potential of Barbados. It is expected this paper will therefore offer greater insight into the factors that influence the exports of Barbados. More importantly, the paper contributes to the economic literature on the export potential of small islands developing states (SIDS) which is important as these countries seek to integrate themselves into the multilateral trading system.

The rest of the paper is therefore organised as follows: section II outlines the data and methodology used in the study, while section III presents the estimation results. In section IV the export potential of Barbados is examined. Finally, section V concludes the study and offers areas for further research.

[1] See the Medium-Term Development Strategy of Barbados 2010-2014 prepared by the Government of Barbados in 2010.

2. Data and Methodology

2.1 Sample Size and Data

This study sought to capture as many countries as possible that Barbados exported merchandise to during 2005. Trade data from the Barbados Statistical Service (BSS) reveals that Barbados exported goods to 117 countries during the year under review. The analysis in this study is centred on 105 of those trading partners. The countries were chosen based on the availability of the data required for the gravity model. Table I provides a full list of the countries sampled. The sample accounted for 98.4 percent of total exports to foreign countries in 2005. Based on the high percentage of export partners captured, it is believed the sample does not suffer from a selection bias.

Table I. Sample of Recipient Countries to the Exports of Barbados in 2005

Angola	Cyprus	Japan	Romania
Anguilla	Czech Republic	Kenya	Saudi Arabia
Antigua and Barbuda	Denmark	Korea (South)	Seychelles
Argentina	Dominica	Korea (North)	Sierra Leone
Aruba	Dominican Republic	Lebanon	Singapore
Australia	Ecuador	Madagascar	Slovak Republic
Austria	El Salvador	Malawi	South Africa
Azerbaijan	Finland	Malaysia	Spain
Bahamas, The	France	Mauritania	Sri Lanka
Bahrain	French Polynesia	Mexico	St. Kitts and Nevis
Belgium	Gabon	Moldova	St. Lucia
Belize	Gambia	Montserrat	St. Vincent and the Grenadines
Bermuda	Germany	Namibia	Suriname
Botswana	Greece	Netherlands, The	Sweden
Brazil	Grenada	Netherland Antilles	Switzerland
British Virgin Islands	Guatemala	New Zealand	Thailand
Bulgaria	Guyana	Nicaragua	Togo
Canada	Haiti	Nigeria	Trinidad and Tobago
Cape Verde	Honduras	Norway	Tunisia
Cayman Islands	Hong Kong	Pakistan	Turkey
Chile	India	Panama	Turks and Caicos
China, Peoples Republic	Indonesia	Peru	Ukraine
Colombia	Ireland	Philippines	United Arab Emirates
Costa Rica	Israel	Poland	United Kingdom
Croatia	Italy	Portugal	United States of America
Cuba	Jamaica	Puerto Rico	Uruguay
			Venezuela

Source: Data obtained from the Barbados Statistical Service

Additional data used in the study included: the Gross Domestic Product (GDP) and GDP per capita of Barbados and those of the countries it exported merchandise to in 2005; and the

distances between Barbados and its trading partners as a proxy for transportation costs. The statistics on GDP and GDP per capita were obtained from the database of the United Nations Statistics Division.[2] Data on the distances (in kilometres) between Barbados and the importing countries were gleaned from Byers (1997).

Dummy variables were also used to represent a common language between Barbados and its trading partners, and preferential market access arrangements the country may have with an export market. Regarding the latter, Barbados enjoys three types of preferential market access arrangements: CARICOM of which the country is a member[3]; bilateral trade agreements (BTAs) that are concluded between CARICOM and countries such as Costa Rica, the Dominican Republic, Cuba, Venezuela and Colombia[4]; and the Generalised System of Preferences (GSP) offered to developing countries.[5]

Table II presents the summary statistics for the sample. The table shows that merchandise exports of Barbados during 2005 ranged from US $45.9 million to US $10. The data also reveals the diversity of the importing countries in the sample. This is especially evident from the high standard deviations that are reported.

Table II. Summary statistics for the sample of data used in the study

	Mean	Median	Max	Min.	Std. Dev.	Obs.
EXPORT ('000 US$)	2,482.5	55.1	45,926.1	0.01	7,262.5	105
Distance (kilometers)	6,932.2	7,132.5	18,320.2	175.0	4,887.3	105
Nominal GDP (US millions)	40,9311.3	36,942.4	12,564,300	43.1	1,369,347	105
Nominal GDP per capita (US$)	14,809.0	6,788.4	75,567.6	214.9	16,658.2	105
BTAs (D)	0.0	0	1	0	0.2	105
CARICOM (D)	0.1	0	1	0	0.3	105
Common Language (D)	0.4	0	1	0	0.5	105
GSP (D)	0.3	0	1	0	0.4	105

Note: D denotes dummy variables

2.1 Methodology and Model Selection

Traditionally, gravity models have been applied to cross-sectional data to estimate trade effects for a particular time period (Sohn 2001; Sandberg et al. 2002; Batra, 2006; Hilbun, 2006 and Rahman, 2009). However, this method may lead to biased results. This bias occurs as the cross-sectional approach does not control for the heterogeneity exhibited among trading partners. Panel data regressions allow for the correction of such effects. Panel data also provides the ability to study dynamic relationships among variables. For applications of the panel estimation

[2] UN Statistics Division website: http://unstats.un.org/unsd/snaama/selbasicFast.asp

[3] Countries of CARICOM include: Antigua and Barbuda, the Bahamas, Barbados, Belize, Dominica, Grenada, Guyana, Haiti, Jamaica, Montserrat, Saint Kitts and Nevis, Saint Lucia, Saint Vincent and the Grenadines, Suriname and Trinidad and Tobago.

[4] http://www.foreign.gov.bb/pageselect.cfm?page=165

[5] See http://unctad.org/en/docs/itcdtsbmisc25rev3_en.pdf . Countries that grant preferential tariff treatment under the GSP include: Australia, Belarus, Canada, Japan, New Zealand, Norway, Russia, Switzerland, Turkey, United States of America and countries of the European Union.

framework, see among others Adam and Tweneboah (2008), Rahman (2003), Thai (2006), and Lim (2006).

Even though panel data analysis has certain advantages, Batra (2006) argued that using these techniques contribute marginally to the estimation results. For this reason, the classical cross-sectional estimations used by Batra (2006) and Rahman (2009) were followed in this analysis. The empirical specification of the gravity model equation is therefore in the form:

$$(1) \qquad Log\ X_{ij} = \beta_0 + \beta_1\ Log\ PGDP_{ij} + \beta_2\ Log\ PPCGDP_{ij} + \beta_3\ Log\ DIS_{ij} + \beta_4\ GSP_{ij} + \beta_5\ BTA_{ij} + \beta_6\ CARICOM_{ij} + \beta_7\ LANG_{ij} + \mu_{ij}$$

where X_{ij} represents the merchandise exports of Barbados to recipient countries. Economic masses are captured by the interaction terms $PGDP_{ij}$ and $PPCGDP_{ij}$. The interaction terms denote the product of the GDP of Barbados and those of importing countries, and the product of the GDP per capita of Barbados and those of importing countries respectively. The term DIS_{ij} represents the distance between Barbados and importing countries. $LANG_{ij}$ symbolises the common language shared between Barbados and recipient countries in the sample. The common language in this case is English. GSP_{ij}, BTA_{ij}, and $CARICOM_{ij}$ all represent the preferential market access agreements Barbados may benefit from with the countries in the sample, while μ_{ij} is an error term that is assumed to be normally distributed.

As a preliminary step in the analysis, the variables under consideration were tested for multicollinearity. In the presence of multicollinearity, the coefficients of regressors may change erratically in response to small changes in the data. A correlation analysis was therefore conducted, and the finding of small correlation coefficients suggests multicollinearity would not be a problem in the model specification (see Table III).

Table III. Pearson's correlations of variables

	EXPORT	**CARICOM**	**DIS**	**LANG**	**GSP**	**RTA**	**PGDP**	**PPCGDP**
EXPORT	1.00							
CARICOM	0.42	1.00						
DIS	-0.31	-0.48	1.00					
LANG	0.40	0.41	-0.14	1.00				
GSP	0.12	-0.17	0.11	-0.13	1.00			
BTA	-0.07	-0.09	-0.23	-0.16	-0.13	1.00		
PGDP	0.55	-0.18	0.05	0.06	0.34	-0.05	1.00	
PPCGDP	0.13	-0.12	0.01	0.11	0.56	-0.14	0.29	1.00

Source: Own calculations of the author

Heteroscedasticity is also a common problem in cross-sectional data analysis. Methods that correct for this are therefore important for prudent data analysis. However, prior to using corrective techniques, White's test for heteroscedasticity was first undertaken. Based on the test we could not reject the null hypothesis of no heteroscedasticity (F-statistic 8.60, p = 0.28). The model was therefore estimated without the use of heteroscedasticity correction measures.

The problem of endogeneity is also considered in this study. If endogenous variables are included in the model as independent variables, the application of Ordinary Least Squares (OLS) would yield biased and inconsistent estimates of the parameters. To deal with potential endogeneity, 2006 data on GDP and GDP per capita were used as instruments. Equation (1) was therefore estimated using simple OLS and two-stage least squares (2SLS) regressions for comparison. The coefficients obtained from using the instruments were not significantly different from the estimation without the instruments (see Model IV in Table IV). Therefore, the problem of endogeneity is not considered an issue, and GDP and GDP per capita are treated as exogenous variables in the estimation.

3. Estimation Results

The results of the cross-sectional OLS regression of the export gravity model for Barbados are reported in Table IV. The findings are reported with and without the dummy variables used to augment the model. The reason for this was to see how well the traditional gravity model by itself explains the export flows of Barbados. Without the dummy variables, the traditional gravity model, as shown in Model I, explains 46 percent of the merchandise exports of the country. The coefficient for the product of the GDP of Barbados and importing countries is also positive and statistically significant. Distance is significant and negative as expected.

Table IV: OLS estimation of the export gravity model for Barbados

Dependent Variable: Log X_{ij} Explanatory Variables:	**Model I**	**Model II**	**Model III**	**Model IV (2SLS)**
Log $PGDP_{ij}$	0.55***	0.50 ***		0.49 ***
Log $PPCGDP_{ij}$		0.70 ***		0.68***
Log GDP_j			0.50***	
Log $PCGDP_j$			0.70***	
Log Dis_{ij}	-2.46 ***	-1.62 ***	-1.62***	-1.62***
$CARICOM_{ij}$		2.46 ***	2.46 ***	2.44***
BTA_{ij}		-0.83	-0.87	-0.82
GSP_{ij}		-0.58	-0.58	-0.54
$LANG_{ij}$		1.47***	1.47***	1.48***
Diagnostics				
R - squared	0.46	0.64	0.64	0.64
F - statistic	43.94***	24.49***	24.49***	24.25***
Observations	105	105	105	105

Note: *** and ** denote significant levels of 1% and 5% respectively

Model II provides the full estimation of the augmented gravity model. Including the additional explanatory variables improves the predictive power of the model by 18 percentage points. The augmented gravity model now explains 64 percent of the variation in the export flows of Barbados. This is consistent with Sandberg et al. (2002) who reported R-Squared statistics ranging from 60 percent to 67 percent throughout the period 1980 to 1996 for CARICOM. The statistic is, however, lower than the 0.75 and 0.70 found in Rahman (2009) and Batra (2004) respectively.

The results of the model suggest that most of the variables under consideration, i.e. the product of the GDPs, the product of the GDP per capita, distance, and common language, all significantly impact the exports of Barbados. In Model II the coefficient for the variable representing the product of the GDPs of both Barbados and its export partner, is positive and statistically significant. Specifically, the model implies that a one-percent increase in the GDPs of both countries should result in a 0.50 percent increase in the exports of Barbados. The coefficient is smaller than those found in Rahman (2009) and Batra (2004) who recorded coefficients of 0.81 and 0.86 in their respective estimations. However, the positive nature of the variable is consistent with the theoretical view that high levels of GDP in the exporting country are associated with a high level of production. As a result, the availability of goods for export increases. Furthermore, a high GDP in the importing country suggests higher imports.

The model also shows a positive and statistically significant correlation between the interaction term for GDP per capita and the merchandise exports of Barbados. This finding suggests that as the income of individuals in recipient countries increase, they demand greater varieties of products leading to an increase in imports. Similarly, in the exporting country, if income per capita increases consumers demand imported commodities. The increase in imported goods would also make domestic products more available for exports. The model specifically suggests that a one-percent increase in the product of the GDP per capita of both countries should result in an increase in exports by Barbados of 0.70 percent. This estimate is significantly higher than Rahman (2009) who obtained a coefficient of 0.08 and 0.17 for the years 2001 and 2005, respectively.

The model further reveals that the official language spoken by trading partners is a significant factor which affects the export activity of Barbados. The positively signed coefficient (1.48), suggests that Barbados is more likely to export its merchandise to other English-speaking countries. The result is not surprising since companies in Barbados that engage in export activities also service the domestic market. Therefore, labels would already be printed in English for the local market. The cost of translating these labels for each export market may be high and serve as a deterrent for exporters. In addition, the import regulations of non-English speaking countries such as Sanitary and Phytosanitary regulations would have to be determined and translated.

Regarding preferential market access, of the three arrangements considered, only CARICOM membership has a positive and statistically significant impact on exports. The positive nature of the variable is expected since most CARICOM countries are near to Barbados and speak English. These two factors make CARICOM markets desirable for domestic exporters. In contrast, the model suggests that other BTAs and the GSP have negative and insignificant effects on the merchandise exports of Barbados. Although not expected, these results are plausible. Barbados, through CARICOM, has concluded several of its bilateral trade agreements with Spanish-speaking countries. Given language is an important factor that determines the merchandise exports of Barbados, most of these markets are under-exploited. As it pertains to the GSP, Barbados has exported few products (except for sugar and rum) to the countries which offer this preferential treatment. Additionally, the recent Everything-But-Arms (EBA)[6] initiative

[6] The EBA provides the 48 nations that are formally classified as Least Developed Countries by the United Nations, duty free access to the EU for all products except arms and ammunition.

in favour of least developed countries would have the side-effect of reducing the margin of preference for merchandise exports from Barbados (WTO, 2002).

Model II also shows that the distance variable from the estimation of equation (1) is statistically significant with the expected negative sign. The estimation yielded a coefficient of -1.62 which is greater than the -1.04 found in Batra (2004), but less than the coefficients of -2.15 and -2.01 in Rahman (2009). Sandberg et al. (2002) also reported a larger distant coefficient of 1.74 for CARICOM as a whole. Nonetheless, it is confirmed by its magnitude in the model that geographical distance is an important resistance factor for the exports of Barbados. This is not surprising given that every additional dollar spent to transport a commodity further away from Barbados, reduces the income of domestic exporters in the country.

The gravity model was also estimated without the interaction terms (see Model III). In other words, the GDP and GDP per capita of Barbados were ignored to see how this would affect the results of the model. From Model III, we can see that the coefficients remain unchanged. This may suggest that the GDP and GDP per capita of Barbados may have little influence on its domestic exports.

4. The Export Potential of Barbados

The coefficients from the previous section were used to predict the exports of Barbados to the countries in our sample. The predicted exports (P) were subtracted from the actual exports of the country (A). Barbados is considered having export potential with importing countries if the result of (P – A) is positive. However, if the result is negative, this suggests Barbados has exceeded its trade potential with that partner. It must be mentioned that this in-sample technique was severely criticised by Egger (2002), who argued that a systematic difference between the observed and predicted trade flows suggests problems of misspecification in the econometric model. It is therefore suggested that future work be undertaken to improve on the export gravity model for Barbados, possibly through the use of dynamic panel specifications.

In estimating the export potential of Barbados, however, the model suggests the country has trade potential with 49.5 percent of the countries sampled (see Table V). The model revealed that the five countries with the most export potential for Barbados are: Dominica, Grenada, Saint Lucia, Saint Vincent and the Grenadines and Trinidad and Tobago. Antigua, Montserrat and Puerto Rico are other Caribbean countries with further export potential for Barbados.

The potential markets for increased merchandise exports are felt to be plausible given their close proximity to Barbados. Additionally, for the top five countries listed with the most potential, all share a common language with Barbados and are members of CARICOM. Consequently, the merchandise export flows of Barbados are influenced by the high positive coefficients associated with these variables.

In contrast, the model suggests that Barbados does not have additional export potential with Belize, Haiti, Guyana, Jamaica, Saint Kitts and Nevis and Suriname. Although these countries are in close proximity to Barbados, it would appear the combination of the other variables led to an indication that these markets may be over-exploited. For example, with Suriname and Haiti, although these countries are members of CARICOM, they do not share a common language with

Barbados. The strong positive coefficient associated with the latter variable is therefore disregarded. The relatively small positive influences of GDP and GDP per capita, coupled with the positive coefficient for CARICOM are therefore not enough to offset the influence of the distances of these countries from Barbados.

Table V. Trading partners of Barbados with export potential

Antigua and Barbuda	Dominica	Korea (South)	Puerto Rico
Australia	Ecuador	Malawi	Romania
Austria	Finland	Mauritania	Saudi Arabia
Bahamas	Gabon	Mexico	Slovakia
Bahrain	Grenada	Moldova	South Africa
Bermuda	Guatemala	Montserrat	St. Lucia
Botswana	Honduras	New Zealand	St. Vincent and the Grenadines
Brazil	Indonesia	Nigeria	Sweden
Bulgaria	Ireland	Norway	Thailand
Chile	Israel	Pakistan	Trinidad and Tobago
Colombia	Japan	Peru	Tunisia
Croatia	Kenya	Philippines	Uruguay
Cuba	Korea (North)	Poland	Venezuela

Source: Own calculations of the author

The model also suggests that Barbados may have fully exploited the traditional markets of the UK, US and Canada. This finding is significant as Barbados, through CARICOM, has been recently engaged in negotiations with Canada towards the development of a trade agreement. CARICOM has also in the past contemplated a similar trading agreement with the US. From a policy perspective Barbados must be mindful that additional market access for its merchandise exports into the US and Canada might not translate into actual increased exports to those countries.

5. Conclusion

For Barbados to attain any future export target, as part of its national strategy, the country must identify viable export markets. This paper sought to identify markets Barbados should concentrate its exports on if the export sector of the country is expanded. By applying a gravity model to data on 105 of the trading partners of Barbados in 2005, it was established that an increase in the GDP and GDP per capita of importing countries in particular, are associated with an increase in local exports. The analysis also revealed that domestic exporters are more likely to trade with members of CARICOM, and countries that share a common language with Barbados. Conversely, as per theoretical expectations, distance is associated with a decrease in exports. Other preferential market arrangements such as the GSP, and bilateral trade agreements, are found to insignificantly impact the export flows of the country. In addition, the GDP and GDP per capita of Barbados may not significantly affect its own merchandise exports.

The estimated model was then solved stochastically to identify markets with export potential for Barbados. The results suggest that among others, Barbados should expand its presence in: Trinidad and Tobago; St. Lucia; Puerto Rico; St. Vincent and the Grenadines; Grenada; Dominica; Antigua and Barbuda; Montserrat; Cuba; Venezuela; and Brazil to mention a few. In

contrast, the model suggests that Barbados may have already exceeded its export potential with countries such as: Jamaica; the Bahamas; St. Kitts and Nevis; Suriname; Belize; Haiti; and Guyana. Moreover, traditional extra-regional markets such as the UK, US and Canada may also be already fully exploited by Barbados. This information is important as it could inform a cost-benefit analysis of engaging in future bilateral trade agreements.

It must be noted, however, that given the limitations of using cross-sectional data this analysis should be viewed as preliminary. The economic literature suggests panel gravity models would address issues pertaining to heterogeneity. Hence, the way forward for the development of a more adequately specified gravity model for Barbados must be using panel data analysis. In addition, more explanatory variables should be considered, such as the market openness and real exchange rates of trading partners, to determine the true export potential of Barbados.

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Appendix I. A Sample of Studies Conducted Using Export Gravity Models

Author(s)	Country	Period	Method	Products	Results
Rahman (2003)	Bangladesh	1972 - 1999	Panel OLS with fixed effects	Aggregate exports	Exchange rate, the total imports of trading partners and the trade openness are significant. Other variables such as distance and GDP have expected signs but are insignificant. Dummy variables insignificant.
Rahman (2009)	Australia	2001 and 2005	Cross-section OLS	Aggregate exports	For both years GDP, GDP per capita, the trade openness of its trading partners and common languages are all positive. Distance has a negative impact.
Hatab, Romstad and Huo (2010)	Egypt	1994 - 2008	Panel OLS with fixed effects	Agriculture exports	Egypt's GDP, GDP per capita and exchange rate volatility have positive effects on agriculture exports. Distance has a negative effect.
Kristjánsdóttir (2005)	Iceland	1989 - 1999	Panel OLS with fixed effects	Aggregate exports	Iceland's GDP and population insignificant. Recipient country's GDP positive. Distance and recipient country's population negative.
De Blasi, Seccia, Carlucci and Santeramo (2007)	Italy	1995 - 2005	Panel OLS with fixed effects	High quality wine exports	High quality wine production, GDP per capita of importing countries, EU membership and EU accession negotiations all have positive effects on the exports of Italian high quality wine.
Eita (2007)	Namibia	1998 - 2006	Pooled, Random and fixed effects models	Aggregate exports	Namibia's GDP, importers' GDPs, countries with a common border, trade with EU and SADC have positive effects on exports. Distance and importers' GDP per capita have negative effects on exports. Namibia's GDP per capita and real exchange rates are insignificant.
Nguyen (2010)	Vietnam	1986 - 2006	Static and Dynamic random effects models	Aggregate exports	Both models yielded similarly signed coefficients. GDP, GDP per capita and exchange rates have positive effects on exports. Remoteness and ASEAN countries have negative impacts. However, in the static model ASEAN is insignificant.
Melchior, Zheng and Johnsen (2009)	Norway	2007	OLS	Exports at the 6-digit HS level	Tariffs have a negative impact on exports. The results of the regressions for the various sectors show that importers' GDPs have a positive and effect on exports while distance has negative impacts.

Table I: A Sample of Studies Conducted Using Export Gravity Models (continued)

Author(s)	Country	Period	Method	Products	Results
Lantz and Drottz (2008)	Sweden	1997 - 2003	Panel OLS	Exports at the 6-digit HS level	Recipient countries' GDPs have an insignificant impact on exports. Distance and landlocked countries have significant impacts.
Butt (2008)	Pakistan	2002 - 2003	Pseudo maximum likelihood	Exports for 19 industries	Tariffs and distance have negative effects on Pakistan's exports. Common languages and borders have positive effects.
Sichei, Erero and Gebreselassie (2005)	South Africa	1994 - 2003	Pooled, static fixed effects and 2SLS dynamic fixed effect models	Motor vehicles, parts and accessories	In all three models importers' GDPs were positive. Importers' population was negative for all models but insignificant for the static fixed effect model. Dummy variables for language, countries in Africa, EU, Asia, NAFTA and MERCOSUR membership were have positive effects on imports. Distance and middle east countries have negative impacts on exports.
Jordaan and Eita (2007)	South Africa	1997 - 2004	Pooled, fixed and random effects models	Wood exports	Importers' GDPs, South Africa's population, English language and SADC and EU members have positive impacts on wood exports. NAFTA has a negative impact on exports. South Africa's GDP and importers' populations and distance are negative but insignificant.
Gu (2005)	China	1999 - 2005	Panel OLS	Aggregate exports	Importers' GDPs per capita and populations have positive effects on China's exports. Trade cooperation also has a positive impact. Remoteness has a negative impact on exports.