Climate Change and Development: Trade Opportunities of Climate Smart Goods and Technologies in Asia

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Abstract

This study focuses on trade opportunities of climate smart goods and technologies (CSGT) in Asia. Paper mainly highlights the export gaps for climate smart goods and technologies (CSGT) in Asia and identifies the trade opportunities among trade partners in intraregional and interregional. Applying the gravity model we estimate the export gap for the CSGT as the difference between the actual bilateral export flow and the mean value predicted by the model. In other words, 'export gap' is the difference between the actual and predicted export value. There is a scope to increase the export of climate smart goods and technologies with trading partners when the actual trade is below the predicted value (i.e., negative value of the export gap). This gap actually provides the opportunity to raise the trade and attracting investment in CSGT sector and thereby development takes place. This paper also identifies the export gaps in CSGT for each regional member in its trade with partners within the region, EU, and North America (i.e., the US and Canada). This study contributes to the empirical literature in terms of measuring and identifying the potential trade opportunity of CGST in Asia.

JEL Classifications: C_{13}, F_{18}, O_{53}, Q

Key Words: Climate Change, Business and Development, Bilateral trade flow, Climate Smart Goods and Technologies, Gravity model, Export gap, Potential Trade, China, India, Asia.

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1. Introduction

Climate change is one of the greatest threats to the human civilization and the toughest challenge for the economic development in the 21st century. Less Developed Countries (LDCs) have contributed negligible or little to cause climate change, yet face its harshest impacts and have the weakest capacity to adapt to these impacts. Truly climate change also provides the opportunity to re-design the economic activities. Climate change also could create the development opportunities in the formation of non-traditional production. For the supply driven economy still trade could be the engine of economic growth. Trade can help developing countries with adaptation, through generating export earnings and accessing technologies. Trade also has a role in mitigation of climate change, through disseminating low carbon technologies. The objective of the clean technology is to improve energy efficiency and reduce environmental impacts. This study provides evidence focusing on trade of climate smart goods and technologies (CSGT[1]) to form the policy opinion on 'climate change and trade'.

1.1 Climate Smart Goods and Technology

Climate Smart Goods and Technology are defined broadly as products[2], components, and technologies which tend to have relatively less adverse impact on the environment. CSGT constitutes low carbon growth technologies. For example, one subcategory is the clean coal. Clean coal technology aims to improve energy efficiency and reduce environmental impacts, including technologies of coal extraction, coal preparation and coal utilization. Wind technology another sub category of CSGT focuses on wind energy generation and is composed of three integral components: the gear box, coupling and wind turbine. The study

[1] CSGT is defined as goods that have relatively less adverse impact on the environment.

[2] It consists of articles of Iron and Steel, Aluminum, machinery and mechanical appliances, electrical machinery equipment, ships, boats and floating structures, glass and glass ware articles, among others.

also observes that trade of such CSGT has a regional bias for most of the countries in the region although almost all are net importers from Japan and Hong Kong and more recently from China.

The climate smart goods (CSGT) is a part of the wider group named environmental goods and services (EGS). An environmental good can be understood as equipment, material or technology used to address a particular environmental problem or as a product that is itself 'environmentally preferable' to other similar products because of its relatively benign impact on environment. Environmental services are provided by eco systems or human activities to address environmental problems and help to minimize the environmental damages and protect the bio-sphere of the earth. EGS can be also classified as environmental goods comprising of pollution management products, cleaner technologies and products, resource management products and environmentally preferable products. EGS also has environmental services comprising of sewage services, refuse services, sanitation and similar services and others. The EGS were first discussed as part of the liberalizing agenda[3] in the DOHA round of the multilateral trading round in 2001. The countries had wanted the tariff and non-tariff barriers to go down for trade of such EGS as this may lead to adoption of cleaner and cost effective technologies by firms and country at large and possibly mitigate climate change and improve energy efficiency. The CSGT (a subset of EGS) were discussed at the multilateral forums as countries wanted a smaller list to liberalize and where in negotiations could be easier done than concentrating on the entire list of environmental goods[4].

It is true that free and liberalized trade can make available such goods for countries which have no access to these goods or where in domestic industry are unable to produce

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[3] Liberalization has followed three routes namely the list approach, project/integrated approach and request for offer approach. Environmental Goods were always part of trade agenda but were subsumed within industrial or agricultural negotiations.

[4] For example WTO came out with a list of 153 goods for liberalization. The World Bank identified 47 products out of 153 products list proposed by proponents of Environment Goods liberalization in the WTO. These 47 products comprised diverse products from wind turbines to solar panels to water saving shower. Similarly OECD and ICTSD had their own lists of environmental goods and services.

them in sufficient scale or at affordable prices. For exporters additional market access can provide incentives to develop new products or technologies with less green house gas emissions. As a whole global climate impact will reduce definitely.

Most of the exporters of EGS are the developed nation but some of the developing countries are also becoming important players in heat and energy management equipment, noise and vibration abatement and in environmental services like air pollution control and solid waste management[5]. In this context developing countries should focus and emphasis more on CSGT trade.

Most of the emerging countries in Asia follow the export led growth. This study highlights the export potential trade gap of climate smart goods and technologies (CSGT) in the Asia, especially focusing on emerging economies in Asia. It deals with the potential trade gap of CSGT for Asian countries within the region and inter-regions especially with European Union (EU), North America (the USA and Canada) and rest of the world. This study is mainly based on the application of the gravity model.

The gravity analysis is useful to explain determinants of exports potential of CSGT for Asian countries within the region and with the US and regional economy like the EU. Gravity model is adopted to explain the role of economic size and endowments, distance between trading partner, membership of multilateral agreement, among others on trade of such climate smart goods or/and sub categories. In particular, the study considers the bilateral trade of the CSGT total exports for years 2008 in our gravity analysis. This study is a cross sectional data analysis for estimating the gravity equation.

This paper is organized as follows. Section 2 reviews the literature. Section 3 describes data and methodology. Section 4 presents results. Finally, Section 5 draws some concluding observations.

[5] See, Veena Jha (2008) for more details.

2. Literature Review

The gravity model of trade is based on the idea that trade volumes between two countries depend on the sizes of the two countries and the distance[6] between them. This simple model has been used extensively in analyzing trade and has been successful to a high degree in explaining trade[7]. There is debate on trade resistances that might limit or promote trade between particular trading partners, often relying on a number of variables to proxy total trade resistances, including trade related costs. Recently global climate change itself creates new resistances on international trade. This climate change resistances also create the opportunity for trade in new direction in the name of green businesses. The review of literature demonstrates the new direction of potential trade gap in climate friendly goods.

Anderson (1979) introduced the gravity model theoretical legitimacy. He derived the gravity equation from expenditure systems where goods are differentiated by country of origin and distance is the proxy of all transport costs. The theoretical foundations of the gravity model as described by Anderson (1979), Bergstrand (1985), Helpman (1987) and Deardorff (1995) start with the assumption of frictionless trade[8] or iceberg transport costs and then, with the exception of Bergstrand, derive a model where trade volumes between country pairs are proportions of the product of incomes or total world trade. Trade shares 'fall naturally into a gravity-equation' (Deardorff 1995). This probabilistic method is comparable to the analysis of trade intensities (Drysdale 1967; Drysdale and Garnaut 1982) which uses the relative size of an economy's trade as a benchmark for what that country is expected to

[6] Distance could be physical, cultural or/and political.

[7] Harrigan (2001) and Anderson and van Wincoop (2004) contain comprehensive reviews.

[8] Bergstrand (1985) made the next significant contribution to giving the model a theoretical underpinning and deriving the model as a 'partial equilibrium subsystem of a general equilibrium model'. Prices are generally considered endogenous in gravity models because they are general equilibrium models with exporter supply and importer demand clearing, but Bergstrand (1985; 1989) introduces and justifies the use of prices from underlying production functions and utility functions where he argues that strong assumptions, such as perfect international commodity arbitrage, are clearly not met in reality. Helpman (1987) derives the gravity model from an imperfect competition model and Deardorff (1995) derives it from the Heckscher–Ohlin model. Indeed, the gravity model can be derived from numerous trade theories in one form or another and can be used to find empirical evidence of many trade theories with different assumptions about preferences and whether goods are differentiated or homogeneous (Deardorff 1995; Harrigan 2001).

trade. Although they give the gravity equation theoretical backing, the assumptions of frictionless trade or iceberg transport costs to capture all the frictions are strong but are a poor proxy for trade friction. The 'border puzzle[9]', of large unexplained trade costs when goods are traded across a national border, has been the focus of much of the literature since McCallum (1995). He applied the gravity model to estimate a value for the loss in trade volume accounted for by goods crossing the US–Canada border as compared to intra-national trade (between states or provinces) in both countries. The findings show that international border effects are inferred and that they matter even with two economies that share a large border and are highly integrated through a regional trade arrangement (RTA) such as NAFTA. Trading across borders will cause disconnect in relative prices as insurance, freight, tariffs, non-tariff barriers, and different regulatory structures cause uncertainty and impede trade to some extend (Rossi–Hansberg 2005).

Linnemann (1966) started a process in the literature of adding trade explicators and inhibitors to the gravity model. Frankel, Stein and Wei (1997) undertake a comprehensive study[10] of regional trading blocs using the gravity model as the main tool. The exchange rate volatility had been commonly included as a trade explanatory in the gravity model, Rose

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[9] Anderson and van Wincoop (2003) claim to solve the border puzzle using McCallum's data by deriving the gravity equation from expenditure functions and importantly adding what they call multilateral resistance. The multilateral resistance terms are important and mean that if country i's trade with country j is being analysed and there is no movement in the trade determinants, a change in country k's trade with country i will affect trade between i and j, as would be expected. Their specification explains away most of the border puzzle. McCallum (1995) found that trade between US and Canada was lower than trade within their borders by a factor, but Anderson and van Wincoop (2003) reduce this unexplained border effect to the border's lowering trade by 44 per cent. They assumed symmetric trade costs to solve their model, which is a significant but unrealistic assumption. Their results are disputed in an important paper by Balisteri and Hillberry (2006) who find that the theory consistent model of Anderson and van Wincoop (2003) does not explain away the border puzzle. Balisteri and Hillberry (2006) relax the assumption of symmetric border costs and account for structural bias in Anderson and van Wincoop (2003) that arises from the incorrect treatment of an adding up constraint which is implicit in the Anderson and van Wincoop (2003) model. The correct estimation of the Anderson and van Wincoop (2003) derivation shows that the literature still cannot explain the border puzzle, or what we prefer to describe here as unexplained resistances.

[10] There are many studies that measure the effects of bilateral and multilateral trade arrangements, both discriminatory and nondiscriminatory, but perhaps none as comprehensive and convincing as that of Frankel, Stein and Wei. They are able to quantify the amount by which different preferential trade arrangements (PTAs) and regional arrangements such as APEC, increase trade by adding trade agreement dummy variables into the standard gravity model. Analysis of regional or multilateral trade arrangements using gravity models is now commonplace and important in applied trade theory.

(2000) made an important contribution as the first to include a common currency dummy variable to explain trade[11].

The wide use of the model, and the policy implications drawn from its application that are quite significant in absolute dollar terms, have led to concentration in the literature on improving on the accuracy of the econometric specifications and techniques. Differing econometric specifications of the gravity equation are numerous[12]. Baldwin and Taglioni (2006) summarize errors that are frequently repeated in the literature. What they call the gold medal error, so named because of the relatively high effect it has on the estimates of all trade resistance variables, is due to the omission of the Anderson and van Wincoop (2003) multilateral resistance terms which are explained above footnote. The second most important error they identify is related to when trade between countries i and j is analyzed as an average of both trade from i to j and trade in the other direction.

Baldwin (1994), Nilsson (2000) and Egger (2002) are the most prominent examples in the literature that use the term trade 'potential' as the expected volume of trade between country pairs that the gravity model predicts. They then measure how far above or below predicted trade from actual trade. It gives a measure of how well a bilateral trade flow performs relative to the mean as predicted by the model. This study contributes in the

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[11] The finding that an economy which is so highly integrated with another economy that there is a common currency, increases trade three fold, as his European Union dummy suggested, had a large impact on the literature with significant policy implications. The idea of increased trade from a common currency is intuitive, but the magnitude was surprising. Baldwin and Taglioni (2006) reduce the magnitude of the common currency effect significantly using Anderson and van Wincoop (2003)'s structural estimation with multilateral resistance.

[12] The question of using population as an explanatory variable is one example where the gravity equation is inconsistent. The theoretical underpinnings derived by Anderson (1979) Helpman (1987) Deardorff (1995), do not justify the inclusion of population, and its effect is positive sometimes and negative other times. A positive effect, implying that a country with a higher population trades more, would be the expected result for developing economies as they tend to be specialised in labour-intensive exports. A negative effect for population size could be due to economies with larger populations having an absorption effect (Martínez–Zarzoso and Nowak–Lehmann 2003). Then why do so many researchers include population? Including the log of GDP and log of population separately in the log linearisation of the gravity model for estimation, is equivalent to including the log of GDP per capita with a restriction on the estimated coefficients of GDP and population separately. However, many papers do not explicitly say this, and the population term is included in the model to control for country size but often ignored in the analysis. The reason GDP per capita is included in so many models is that it has meaning in the context of using the Linder hypothesis in explaining trade flows.

empirical measurement of potential trade gap of climate smart goods for Asia. It also highlights the climate smart export-led growth model for emerging Asian countries.

3. Data and Methodology

This study has been able to define 64 such goods under 6 digit HS code (2002) by putting together various lists that have been defined by various international organizations recently. The list[13] is arrived by defining concordance series from series of list given by the World Bank, ICTSD, WTO, APEC and the OECD. The study considers these CSGTs as one category and estimates above mentioned trade indicators for this category. Following the World Bank (2008) we have been able to sub group these 64 goods further into clean coal technologies (HS code 840510, 841181 and 841182), Wind Energy (HS code 848340 and 848360), Solar Photovoltaic systems (Hs code 850720, 853710 and 854140) and Energy Efficient Lighting (HS code 853931). The study besides these four sub groups have also considered 'Other Codes' as the fifth group which consists of all HS codes not considered in the four categories above. All these 64 CSGT items are considered as single trade item for this study purpose.

Climate Smart Goods (CSGT) trade data (in value, 1000 US dollar) is taken from UN COMTRADE data (www.comtrade.un.org) for the year 2008. Gross Domestic Production (GDP) and per capita GDP data are taken World Bank Development Indicators (www.worldbank.org\data) for corresponding years. Distance between countries and other dummy variables are taken from the dist_cepii.xls file of CEPII DATABASE (see the website: www.cepii.fr). Total observation is reduced after combining all the variables for each pair of trading partners[14]. This filtered data set is used in the empirical analysis.

The following gravity model is considered for the analysis

[13] List of 64 climate smart goods with HS code is given in Appendix.
[14] This study considers fully matched data only.

$$X_{ij} = \beta_0 + \beta_1 GDP_i + \beta_2 GDP_j + \beta_3 PCGDP_i + \beta_4 PCGDP_j + \beta_5 DT_{ij} + \beta_6 D_{contig} + \beta_7 D_{comlang} + \beta_8 D_{comlang\_ethno} + \beta_9 D_{colony} + \beta_{10} D_{comcol} + \beta_{11} D_{col45} + \beta_{12} D_{smctry} + \beta_{13} Tariff_j + \varepsilon_{ij}$$

Where x_{ij} denotes the value of country i exports to country j, GDP_i and $PCGDP_i$ denote the exporting country's gross domestic product and per capita GDP, respectively; and GDP_j and $PCGDP_j$ denote the gross domestic product and per capita GDP of the partner of the exporting country, respectively; DT_{ij} denotes the distance between the exporting country and its partner; D_{contig}, $D_{comlang}$, $D_{comlang\_ethno,}$ D_{colony}, D_{comcol}, D_{col45} and D_{smctry} are the dummy variables for contiguity, common language, colony, common colony, colony from 1945 and small country, respectively.

In our regression analysis we have used the log values of all the variables (except dummies) to overcome heteroscedasticity problem.

4. Results

Overall trade performance was quite satisfactory in Asia in 2008. Export of CSGT performance was very good during the crisis period especially in 2008. Initially the preliminary findings are summarized and discussed. Asia's actual export of CSGT trade was nearly 119.74 billion USD in 2008. Out of it, intraregional and interregional trades were 61.19 and 58.55 billion USD, respectively. Intraregional demand was nearly 51% and only 49% for interregional demand of CSGT. It is true that internal demand within the region is very high for the climate smart goods and over time it will increase with economic development.

Following Baldwin (1994), Nilsson (2000) and Egger (2002) many Asian countries are far below the expected trade performance as the literature define the term 'trade potential' between country pairs and it is measured how far above or below potential trade actual trade is. Trade potential is measured as the difference between actual export and predicted value of export of CSGT. It is a measurement of how well a bilateral trade flow performs relative to the model predicted mean value for Asian countries.

Using econometrics technique the above gravity equation is estimated for analysis purpose. Table 1 presents the estimated results of the gravity model for the CSGT in 2008. Statistically significant coefficients are highlighted and marked with stars (***). The coefficients of GDP reporter, GDP partner, per capita GDP of reporter, geographical distance between two countries, common colony and small country are statistically significant at 1% level. The coefficient of common language is also significant at 10% level (actual significance level is 6.7% or P-value is 0.0667) and marked as one star (*).

Considering only statistically significant coefficients the estimated export of CSGT is

$$X_{ij} = -49.27 + 1.605\,GDP_i + 0.94\,GDP_j - 0.28\,pcgdp_i - 0.93\,DT_{ij} + 0.69\,D_{cmcl} + 2.99\,D_{smctry}$$

The export elasticity of climate smart goods (CSGT) is elastic with respect to gross domestic production (GDP) of reporting country which suggests that export of CSGT would be increased by more than 1.6 percent if income of the reporting country increases by one percent. So, the growth of CSGT export is more than the reporter country's GDP growth. The CSGT export led-growth is highly important to follow sustainable development to all reporting countries in Asia. In terms of scale effect, the export of CSGT for reporter country is playing an important role for its economic growth. The export elasticity of CSGT is inelastic with respect to partner country's GDP. It suggest that if partner country's GDP increases by one percent the export of CSGT increases by 0.94 percent in reporter country's GDP. From this probably one can guess that one part of partner country's internal demand is fulfilled by their production of CSGT. The export of CSGT decreases by 0.28 percent as per capita GDP increases by one percent. It is due to internal demand of CSGT. It is true that internal demand of CSGT increases in each country with their economic growth in Asia. It might help the emerging Asian nations to grow with sustainable development. It is clear that export of CSGT increases in Asia due to possibly economics of scale that also raises per capita income which increase internal demand of CSGT. Internal demand increases because of the awareness of global climate change and availability of CSGT. So the opportunity of green business in Asia is growing and business of CSGT is expanding. Countries in Asia are prepared to shape the economy towards sustainable development. The coefficient of distance between country pair is negative as it is expected in the gravity model. This observation supports the existing literature on trade gravity model. The exports of CSGT are more in the common colony compared to others. Overall CSGT exports are higher in small countries compare to others in Asia. Constant term is statistically highly significant which might capture other unknown factors. Detail depth study is required to explore the reasons behind it.

4.1 Discussion

Using the gravity model we estimate the predicted export trade value of the reporting country with its trade partners. Now it could be analyzed in details. For this analysis purpose our focus is on Asian countries. There is gap between the actual and predicted value. More specifically, in this study the ‘trade potential’ is the trade gap which is defined as the actual trade less than predicted value. ‘Trade potential’ suggests that there is a scope to increase the export of climate smart goods with its partner. The total estimated export potential of climate smart goods in Asia is around 30 – 35 billion US dollar.

Trade performances of CSGT export are far below their predicted value in many Asian nations. This trade gap suggests that they could increase the export of CSGT. These countries could be increased their potential export trade of CSGT nearly 7.34 billion USD. Among these countries India (4.2 billion USD) is in the top followed by Russia (1.51 billion USD), Pakistan (0.98 billion USD), Hong Kong China (0.59 billion USD), Azerbaijan (6.7 million USD) and Bhutan (1.86 thousand USD) etc. These major countries have huge untapped potential trade gap of CSGT.

Intraregional demand for CSGT is also very high. Actual intraregional import was 61.2 billion USD in 2008. Some countries could not fulfill its import demand during the crisis period in 2008. These countries could be increased their import trade of CSGT nearly 19.84 billion USD only through intraregional trade. The major import potential countries are Korean republic (15.78 billion USD), Pakistan (2.79 billion USD), Armenia (7.37 million USD) and Bangladesh (1.26 billion USD) etc.

This study analyzes trade potential in two ways – intra region and the rest of the world. The rest of the world is sub-divided into European Union (EU), North America (USA & Canada) and others. The potential trade gap of CSGT for each member is identified its partners within region, EU and the US and Canada. Now the paper discusses the potential trade gap of CSGT for selected few emerging countries of Asia.

During global economic crisis in 2008 China's trade performance was better than any other country in the region or/and in the world. China can adjust trade immediately within region (Dinda 2011a). **China** has utilized moderately trade of CSGT and still has potential to increase its trade of CSGT. Within Asia, China has strong trade potential to export to Korean Republic, Armenia, Hong Kong, Bhutan and Nepal. China can also increase CSGT trade with small countries. The most important and encouraging China's potential trade gap of CSGT are with European Union, especially Luxembourg and Austria. The estimated China's potential exports of CSGT are 190 million US dollar within ESCAP region and 31.3 million USD with EU. China has strong trade potential particularly with South Korea and estimated potential export of CSGT to Republic of Korean is nearly 170 million USD. China should explore this potential trade gap and helps to stimulate to control climate change regional as well as global.

India has potential to increase its potential trade gap of CSGT. Within Asia, India has strong potential export trade of CSGT to Pakistan, Mongolia, Bangladesh, Armenia, Kazakhstan, Azerbaijan, Japan, Vanuatu, Russia, China, Kyrgyz Republic, New Zealand, Hong Kong, Korean Republic, Indonesia, Iran, Philippines, Georgia. India has a great potential export trade of CSGT to developed countries. The most important and encouraging India's CSGT trade potential are with European Union, especially Luxembourg, UK, Latvia, Cyprus, Greece, Hungary, Slovenia, Slovakia, Austria, Finland, Ireland, Poland, Spain, Lithuania, Bulgaria, Romania, Denmark, Sweden, France, Italy and Czech Republic. India has trade potential to increase trade of CSGT with Canada. The estimated India's CSGT exports potential are 4.976 billion US dollar within Asia and 1.01 billion USD with EU. India's export potential trade gap of CSGT is higher in Asia than EU. India has strong trade potential with Pakistan, Bangladesh, China, Japan, Russia, and South Korea and estimated potential export of CSGT to these countries are nearly 4.9 billion USD. India's CSGT export potential to Pakistan and Bangladesh is 4.4 billion USD. India should explore this potential trade gap and can stimulate to control climate change in the region. India's CSGT potential trade gap top partners in EU are UK, France, Italy, Poland, Greece and Austria and this potential trade gap is nearly 1 billion USD. India has potential to increase its export of CSGT to Asia and EU approximately more than 6 billion USD.

5. Conclusion

This paper highlights the export potential trade gap of CSGT in Asia. Since most of the emerging economies in Asia follow the export-led growth, this study highlights the potential trade gap of CSGT in Asia. Applying the gravity model this paper suggests that there is a scope to increase the export of climate smart goods with trading partners. In Asia, the estimated export gap of CSGT was nearly 30 billion US dollar (USD) in 2008. This study contributes in the empirical measurement of potential trade gap of climate smart goods in Asia. Paper supports the export-led growth model of climate smart goods in Asia.

This paper also identified the trade potential in CSGT for each country and also its partners within Asia, EU, and the US and Canada. There is a huge variation in the potential trade gap among nations. This study identified one of the major reasons was the variation of tariff rates between countries in 2008. Other reasons might be lack of awareness, unavailability of technology, lack of skilled labour for production of CSGT, govt. policy towards climate smart goods, lack of trade facilitations etc. Our next agenda is to explore these in details. More depth study is needed.

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Table 1: Results of the trade gravity model for the export of climate smart goods in 2008

	Coefficients	Standard Error	t	P-value
Intercept	**-49.2722*****	1.717189	**-28.6935**	6.7E-156
GDP_reporter	**1.605207*****	0.045923	**34.95458**	1.1E-216
GDP_partner	**0.940022*****	0.035135	**26.75493**	3.3E-138
pcgdp_reporter	**-0.28074*****	0.052835	**-5.31359**	1.17E-07
pcgdp_partner	-0.07698	0.051787	-1.48651	0.137275
distw	**-0.9346*****	0.105363	**-8.87032**	1.39E-18
contig	0.142705	0.439915	0.324391	0.74567
comlang_off	0.017709	0.356485	0.049675	0.960385
comlang_ethno	*0.576956**	0.314579	1.83406	0.066769
colony	0.83704	0.786272	1.064568	0.287179
comcol	**0.689932*****	0.246621	**2.797538**	0.00519
col45	1.12345	0.947884	1.185219	0.236048
smctry	**2.995375*****	0.79718	**3.757463**	0.000176

Note: '***', '**' and '*' denote the statistical level of significant at 1%, 5% and 10%, respectively.