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Paraguay and the Asian Markets: An Analysis from the Gravity Model

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ABSTRACT

Paraguay and the Asian Markets: An Analysis from the Gravity Model: This research presents an analysis of Paraguay's exports to Asia during the 2008-2019 period. This analysis aims to examine the opportunities for a greater commercial relationship between Paraguay and the economies of Asian countries. A gravity model of international trade and the panel data technique are used, including the main Asian countries that import Paraguayan products.

Keywords: Asia, International Trade, Exports, Gravity Model, Panel Data / Asia, Comercio internacional, Exportaciones, Modelo de gravedad, Datos de panel

INTRODUCTION

In the twelve years of the 2008-2019 period, Paraguay's exports to Asian countries totaled USD 9,387 million FOB, representing 10% of the country's total exports. The main destinations are: India, with a share of 17.7% of total sales to Asia; Israel, with 16.4%; Bangladesh, with 9.2%; Vietnam, with 8.7%; and Japan, with 7.2% of the total exported to the continent (BCP 2020).

Among the products sold by Paraguay to Asia, the following stand out: soybean oil, with 27.8% of the total value exported to the continent; soybeans and other seeds with 24.3%; frozen beef, with 16.1%; soybean meal, with

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10.1%; corn, with 4.2%; and hides and skins, with 4.1% (BCP 2020).

During the 2008-2019 period, the average annual income from sales to Asian countries was USD 782 million FOB. The percentage of exports to Asia in relation to total Paraguayan exports increased from 7.8% in 2008 to 9.9% in 2019. Sales were USD 791 million in 2019 and, according to preliminary data, exports to Asian countries amounted to USD 716 million in 2020, which would correspond to 9.1% of Paraguay's total sales abroad (BCP 2020).

This work analyzes Paraguay's exports to Asia during the 2008-2019 period through the application of a gravity model of international trade. The objective of this analysis is to examine the opportunities that a greater commercial relationship with the economies of the Asian continent would present.

THE GRAVITY MODEL OF INTERNATIONAL TRADE

The physical law of universal gravitation proposed by Isaac Newton in 1687 is the origin of the gravity model of international trade. The universal law of gravitation establishes that the greater the mass and proximity of two bodies, there will be more force of attraction between them. William Reilly used this approach to create a gravity model in 1931 to measure retail trade between two cities (Rosenberg 2020).

Later, Walter Isard contributed to the study of the gravity model by applying the methodology to regional analysis (Isard 1960). However, Chaney (2011) states that it was Jan Tinbergen who, in 1962, used the analogy with Newton's law of universal gravitation to describe the patterns of aggregate flows of bilateral exchange. Tinbergen described the exchange between countries A and B as proportional to their products and inversely proportional to the distance between them, which implied the application of the model to international trade.

According to Tinbergen, there are three factors that explain trade flows: (i) the potential supply of the exporting country and the potential demand of the importing country; (ii) the population; and (iii) resistance to trade, which in turn can be natural or artificial. Natural barriers are transportation costs and time, while artificial barriers are those imposed by governments, such as tariffs, import quotas and exchange controls (Sá Porto 2002).

Paul Krugman also contributed to the refinement of the gravity model with the most widespread theoretical justification presented in 1980, where trade depends positively on the income of the countries and negatively on the distance between them (Kume and Piani 2000). Azevedo (2004) states that, although there is no complete correspondence between the theoretical models of international trade and the variables used, several authors have shown that the gravity model can be derived from both the Heckscher-Ohlin model and imperfect competition models.

Since his empirical proposition in the 1960s, the equation representing the gravity model was based on a series of theoretical articles. These articles demonstrated that its basic formulation is consistent with various models of trade flows, with which its empirical application expanded (Frantianni 2007).

The gravity model strengthened its theoretical foundation with the incorporation of statistics and the development of the new theory of international trade in the 1980s and 1990s. The development of the model, added to the contribution of econometrics and the introduction of the panel data technique, affirmed it as a strong analysis tool (Nascimento and Júnior 2013).

THE PANEL DATA TECHNIQUE

A panel data model is one that includes a sample of units of interest (individuals, companies, banks, cities, countries, etc.) for a given period of time (Mayorga and Muñoz 2000). The panel data technique is therefore a combination of cross-sectional and time series data.

With the application of econometrics, the gravity models went from their original configuration of transversal analysis to the use of panel data, which eliminated distortions that had been previously detected (Nascimento and Júnior 2013). According to Baronio and Vianco (2014), the main objective of applying the panel data technique is to capture unobservable heterogeneity, either between units and over time.

In this way, applying dashboard data enables you to analyze specific individual effects and temporal effects. Individual effects are those that unequally affect each of the study units, which are invariant over time and directly affect the decisions made by units. Temporal effects are those that affect all study units equally and that can be associated, for example, with macroeconomic shocks (Baronio and Vianco 2014).

The panel data technique has advantages and disadvantages. Among the advantages it can be mentioned that: (i) allows to have a greater number of observations, improving the efficiency of the estimates; (ii) recognizes unobservable heterogeneity, both between units and over time; (iii) assumes and incorporates into the analysis the fact that the units are heterogeneous, (iv) allows better study of the dynamics of adjustment processes; and (v) makes it possible to develop and test relatively complex models. The disadvantages are related to obtaining statistical information on the study units, when it is derived from surveys, interviews or other means (Mayorga and Muñoz 2000).

The estimation with the panel data technique can be carried out through the linear regression model under the Ordinary Least Squares method for combined data (OLSC), through the Fixed Effects (FE) model and through the Random Effects model (RE). The estimation through the OLSC model considers the longitudinal sample without taking into account the cross-sectional and time series nature of the data.

The FE model considers that there is a different constant term for each individual and assumes that the individual effects are independent of each other, so that the intercept of each individual remains fixed in time. The model considers that the explanatory variables affect the cross-sectional units equally and that these are differentiated by their own characteristics, measured by means of the intercept (Baronio and Vianco 2014).

On the other hand, the RE model considers that the individual effects are not independent of each other, but rather are randomly distributed around a given value. This model assumes that the number of factors that affect the dependent variable, but have not been explicitly included, can be appropriately summarized in the random disturbance. In this way, the RE model considers that both the impact of the explanatory variables, as well as the characteristics of each cross-sectional unit, are different. In the case of the RE model, the Ordinary Least Squares method is not applicable because its assumptions are not met, for which the Generalized Least Squares (GLS) method is preferable (Baronio and Vianco 2014).

METHOD: MODEL SPECIFICATION AND DATA SOURCE

The gravity model of international trade is expressed in the gravity equation, which is one of the most robust empirical findings in international economics. The gravity equation establishes that the bilateral exchange between two countries is proportional to their respective sizes, measured by the Gross Domestic Product (GDP), and inversely proportional to the geographical distance between them (Chaney 2011).

The basic gravity equation is expressed in the following way and in logarithmic form (Azevedo 2004):

$$Mij = B0 + B1\ lnYi + B2\ ln(Yi/Ni) + B3\ lnYj + B4\ ln(Yj/Nj) + B5\ lnDij + eij \quad (1)$$

where:
Mij is the bilateral trade in nominal exports or imports, or in the sum of both, from country i to country j;
Yw is the nominal GDP of countries i and j;
Nw is the population of countries i and j;
Dij is the distance between countries i and j;
B1, B2, B3 and B4 are parameters that are expected to have a positive sign;
B5 is a parameter that is expected to have a negative sign; and
eij is the error term.

The coefficients associated with the GDP of the exporting and importing countries are expected to show a positive sign. This is because the higher the income of a country, the greater the variety of products available for export and the greater the preference of its inhabitants for the variety of consumption.

There are also reasons that indicate that GDP per capita has a positive impact on trade, because as countries develop, the greater the supply and demand for differentiated products. The distance between countries, on the contrary, represents a resistance to trade and should present a negative impact (Azevedo 2004).

The two standardized ways of measuring the size of countries in a gravity model are per capita product and population. Holding output constant, the population coefficient is generally negative, capturing the well-known phenomenon that larger countries tend to be relatively less open to trade as a percentage of their output. It is mathematically equivalent to express the explanatory variables as GDP and GDP per capita, or as GDP and population, showing inverse signs the coefficients associated with GDP per capita and population (Frankel 1997).

Considering the objective of this study, the gravity model to be applied was specified as follows:

ln EXPij = B0 + B1 ln GDPi + B2 ln CAPi + B3 ln GDPj + B4 ln CAPj + B5 ln DISTij + eij (2)

where:

EXPij is Paraguay's exports to country j;
GDPi is the GDP of Paraguay;
CAPi is the GDP per capita of Paraguay;
GDPj is the GDP of country j;
CAPj is the GDP per capita of country j;
DISTij is the distance between the capital of Paraguay and the capital of country j;
B1, B2, B3 and B4 are parameters that are expected to have a positive sign;
B5 is a parameter that you expect to have a negative sign; and
eij is the error term.

Equation 2 was estimated with the panel data technique, through the statistical program Gnu Regression, Econometrics and Time-series Library (GRETL), version 2019c.

The data cover the main Asian destination countries for Paraguay exports during the twelve years of the 2008-2019 period. The ten countries considered are: Bangladesh, China, South Korea, Hong Kong (China), India, Indonesia, Israel, Japan, Thailand and Vietnam. Together, exports to these ten countries represented 85.5% of the total value of Paraguayan exports to Asia during the period analyzed.

To estimate the gravity equation, annual data for the 2008-2019 period were used, separated into ten panels, one for each importing country. The data on exports from Paraguay to these countries are statistics from the Central Bank of Paraguay. Current dollar values were converted to constant 2010 dollars.

The GDP and GDP per capita in constant 2010 dollars were obtained from the World Bank's World Development Indicators database. The distance in kilometers between the capital of Paraguay and the capital of each of the importing countries was obtained from www.DistanceCalculator.net.

To determine which panel data model is the most appropriate, the Hausman and Breusch-Pagan contrasts were used. An analysis of the relationships between the variables was also carried out to detect collinearity problems, and a test to check the normality of the error, a condition that must be met for the application of the other parametric tests of hypotheses associated with the linear regression model.

Similarly, the eventual presence of heteroscedasticity and autocorrelation was graphically verified. These problems affect both cross-sectional and time series data, so they can be presented in the estimation with panel data (Gujarati 2006).

RESULTS

The gravity equation was estimated by applying three panel data models: (1) Ordinary Least Squares for Combined data (OLSC); (2) Fixed Effects (FE); and (3) Random Effects (RE). Annual data from the 2008-2019 period were used, with a total of 120 observations divided into ten panels.

An analysis of the relationships between the variables was carried out through the matrix of coefficients, observing a strong correlation between the GDP and the GDP per capita of Paraguay, for which the variable that measures the GDP per capita of Paraguay was excluded in order to avoid a collinearity problem. In the case of the FE model, the same also happened with the variable that measures distance.

The estimation by robust standard errors was used, in order to correct the heteroscedasticity and autocorrelation problems detected. According to the normality test of the residuals, the error has a normal distribution in the three models, as the null hypothesis is not rejected with non-significant p-values at the 1% level (Table 1).

Table 1: Results

	Model 1: OLSC	Model 2: FE	Model 3: RE (GLS)
const	-8,833 (20,28)	-125,1 (115,8)	-8,811 (20,20)
ln_GDPi	2,260** (0,8148)	1,607 (1,542)	2,261*** (0,8048)
ln_GDPj	0,05022 (0,08093)	5,927 (7,079)	0,05284 (0,09278)
ln_CAPj	-0,07958 (0,07502)	-6,557 (8,627)	-0,08324 (0,07540)
ln_DISTij	-2,967*** (0,5416)		-2,974*** (0,5386)
N			120
R^2			0,3102

Dependent variable: ln_EXPij
Robust standard errors (HAC), standard errors in parentheses
** significant at the 5% level, *** significant at the 1% level

In order to define the most appropriate panel data model, the Hausman contrast was applied, which resulted in a non-significant p-value at the 1% level. This indicates that the null hypothesis that the RE model is consistent cannot be rejected, contrary to the FE model. For its part, the Breusch-Pagan Lagrange multiplier yielded a significant p-value at the 1% level, which implies an indication against the null hypothesis that the OLSC model is adequate, in favor of the RE model.

Defining the RE model as the appropriate one, its results indicate that the independent variables generally explain the dependent variable at a level of 31.02% (R squared value). In this way, it is possible to affirm that the GDP of Paraguay, the GDP and the GDP per capita of the importing countries, and the distance between the Paraguayan capital and that of the importing countries explain 31.02% of Paraguayan exports to the ten Asian countries considered, in the period 2008-2019.

The coefficient of the Paraguayan GDP variable is statistically significant at the 1% level and has a positive sign. This coefficient indicates that with a 1% increase in Paraguay's GDP, exports increase by 2.26%, keeping the other variables of the model constant (the p-value indicates that the null hypothesis of individual non-significance should be rejected).

The coefficients of the variables GDP and GDP per capita of the importing countries are not statistically significant (the p-value indicates that the null hypothesis of individual non-significance cannot be rejected).

Finally, the coefficient of the variable that measures the distance between the capital of Paraguay and the capitals of the importing countries is statistically significant at the 1% level and has a negative sign. Its coefficient expresses that an increase of 1% in the distance between the capitals of Paraguay and the importing countries produces a reduction of 2.97% in exports from Paraguay.

DISCUSSION

Using the panel data technique and the Random Effects (RE) model, the independent variables of the proposed gravity model explain 31% of Paraguayan exports to Asia in the 2008-2019 period.

With regard to this relatively low coefficient of determination, Zanquetta de Pintor et al. (2019), citing Castilho (2002), state that the gravity models with a higher level of disaggregation generally show lower coefficients of determination due to the "disaggregation bias". This bias implies that variables such as GDP and population, which represent income or the size of the country, lose explanatory power over disaggregated trade flows.

The strong positive link between Paraguay's GDP and exports to Asia is highlighted, a result that is consistent with what is expected according to theory. This relationship indicates that a higher income from Paraguay would increase export capacity, and that most of the exported products would not compete in the domestic market.

Regarding the variable that measures distance, the result indicates that an increase in the distance between Paraguay and the ten Asian countries considered is associated with a decrease in exports. This result coincides with the theoretical foundation of the gravitational model that transportation costs and time constitute natural barriers to international exchange.

The results obtained would indicate that there is a potential for growth in the export capacity of Paraguayan products to Asia, especially those for already consolidated sales, such as: seeds, flour and oil of soybean; corn; frozen beef and leather. Paraguay has competitive advantages in these products, which do not compete in the domestic market.

According to WWF (2016), the greatest expansion of soybean cultivation worldwide occurred in South America: from 17 million hectares cultivated in 1990 to 46 million in 2010. In this region, Paraguay is ranked third in soybean productivity, after Brazil and Argentina. Regarding the world demand for soybeans and beef, it showed an exponential growth during the last decade.

Paraguay, with an economic structure based on the primary sector, participates in an important way in this international market. Soybeans and beef represent 25% of Paraguay's GDP and 65% of exports. At the world level, Paraguay has been among the five largest soybean producers and among the ten largest exporters of beef (WWF 2016).

According to WWF (2014), the rapid growth of soybean cultivation is related to the increasing production of meat, especially pork and chicken. In Asia, China's soybean consumption doubled in the last decade, from 25.7 million tons in 2000 to 55 million in 2009, of which 41 million tons were imported.

With regard to beef, population growth and increased income generate, as in the case of soybeans, a growing international demand. Livestock contributes 15% of the calories and 25% of the proteins in the world diet, since meat provides essential micronutrients that are not easily obtained through vegetable products (FAO 2009).

Although Paraguay has access to numerous export markets, the country sells approximately 90% of its beef to just five countries. The livestock sector recognizes the need to diversify export destinations, especially towards those that pay higher prices, standing out in Asia: Japan, South Korea and China, and in Southeast Asia: Singapore, Vietnam and Malaysia (USDA 2020).

Likewise, as a member of the Southern Common Market (MERCOSUR), Paraguay has gained greater commercial relations with certain extra-regional countries that represent new open markets for exports to Asia, such as India and Israel (Arce 2013).

Through the Revealed Comparative Advantages Index, Arce (2013) concludes for the case of India that Paraguay has competitive advantages in the oil and chemical products sector. With regard to Israel, the advantages are revealed in the wood and beef products industry. In fact, an increase in beef exports to Israel is expected from 2021 (USDA 2020).

On the other hand, China became the main destination for aggregate South American exports in 2016, even surpassing the United States of America. The increase in demand for agricultural and mineral commodities transformed China into a leading trading partner for Latin American countries. Paraguay and China do not have established diplomatic relations, so the link with this country should be reconsidered (Rojas 2018).

According to Rojas (2018), Paraguay should build the foundations of a foreign policy of strategic positioning in the Asia-Pacific Region. This would imply redefining new terms of the relationship with Taiwan and establishing greater ties with China. This projection policy towards Asia should also include a renewal of the agenda with traditional partners such as South Korea and Japan.

CONCLUSIONS

The proposed gravity equation of international trade showed relative consistency with its theoretical foundation. Through the panel data technique and the Random Effects model, it was verified that the independent variables explain 31% of Paraguay's exports to its ten main trading partners in Asia in the 2008-2019 period.

The variables that measure the Gross Domestic Product (GDP) of Paraguay and the distance that separates Paraguay from the importing countries presented significant coefficients. As indicated by the theory of the gravity model, there was a positive relationship between Paraguay's GDP and exports, and a negative relationship between distance and exports.

Paraguay, with an economic structure based on the primary sector, would have important opportunities to expand its exports to the Asian continent. These opportunities would be more relevant in products such as soybeans and beef.

In addition to traditional partners such as Japan, South Korea, and Taiwan, Paraguay's deepening trade relations with Asia should include India, Israel, Bangladesh, Vietnam, and other countries such as Indonesia, Thailand, Singapore, and Malaysia. Paraguay should also build greater ties with China, a country that has become the main destination for South American exports.

Finally, the analysis of Paraguay's international trade with Asia could be deepened through the introduction of new variables that enrich the analysis, as well as through other models and different perspectives.

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Annexed

Correlation coefficients

ln_GDPi	ln_CAPi	ln_GDPj	ln_CAPj	ln_DISTij	ln_EXPij	
1,0000	0,9978	0,1108	0,0908	0,0000	0,3521	ln_GDPi
	1,0000	0,1097	0,0899	0,0000	0,3601	ln_CAPi
		1,0000	0,2742	0,1992	-0,0044	ln_GDPj
			1,0000	-0,0521	-0,0432	ln_CAPj
				1,0000	-0,4144	ln_DISTij
					1,0000	ln_EXPij

Critical value at 5% (two-tailed) = 0,1793 for n = 120

Model 1: Ordinary Least Squares method for combined data (OLSC)

	coefficient	*std. error*	*t-ratio*	*p-value*	
Const	-8,83344	20,2814	-0,4355	0,6734	
ln_GDPi	2,26032	0,814815	2,774	0,0216	**
ln_GDPj	0,0502223	0,0809276	0,6206	0,5503	
ln_CAPj	-0,0795803	0,0750242	-1,061	0,3164	
ln_DISTij	-2,96674	0,541553	-5,478	0,0004	***

Dependent variable: ln_EXPij, robust standard errors (HAC)

R-sq	0,310229	R-sq corr	0,286237
F(4, 9)	21,06986	P-value (F)	0,000136

Normality test: Null hypothesis: [The error has a normal distribution] Chi-sq (2) = 7,60397 p = 0,0223264

Model 2: Fixed Effects (FE)

	coefficient	*std. error*	*t-ratio*	*p-value*
Const	-125,130	115,810	-1,080	0,3080
ln_GDPi	1,60723	1,54203	1,042	0,3245
ln_GDPj	5,92707	7,07872	0,8373	0,4241
ln_CAPj	-6,55660	8,62708	-0,7600	0,4667

Dependent variable: ln_EXPij, robust standard errors (HAC)

R-sq MCVF (LSDV)	0,476640	R-sq 'intra'	0,210034

Normality test: Null hypothesis: [The error has a normal distribution] Chi-sq (2) = 4,29291 p = 0,116898

Modelo 3: Random Effects (RE) (GLS)

	coefficient	*std. error*	*z*	*p-value*	
Const	-8,81070	20,1957	-0,4363	0,6626	
ln_GDPi	2,26069	0,804836	2,809	0,0050	***
ln_GDPj	0,0528416	0,0927823	0,5695	0,5690	
ln_CAPj	-0,0832385	0,0753992	-1,104	0,2696	
ln_DISTij	-2,97404	0,538585	-5,522	<0,0001	***

Dependent variable: ln_EXPij, robust standard errors (HAC)

Var (between) = 0,176087 Var (within) = 0,50729
Theta = 0,560003 Corr (y,yhat)^2 = 0,310198

Normality test: Null hypothesis: [The error has a normal distribution] Chi-sq (2) = 7,59449 p = 0,0224325
Hausman test: Null hypothesis: [GLS estimators are consistent] Chi-sq (2) = 0,771401 p = 0,679974
Breusch-Pagan test: Null hypothesis: [Variance of the unit-specific error = 0]
Chi-sq (1) = 14,6212 p = 0,000131428

Data

Country: Bangladesh, DISTij: 16762			
Year	**EXPij**	**GDPj**	**CAPj**
2008	7360849	103950531261	720
2009	6246136	109194965287	748
2010	45615890	115279077465	781
2011	40050349	122731154082	822
2012	37341764	130735015707	866
2013	89331829	138596904008	907
2014	95539688	146997344630	951
2015	87198373	156629551255	1002
2016	131104593	167771360259	1062
2017	106999613	179992118771	1127
2018	77012465	194146236466	1203
2019	49449098	209974367462	1288

Country: China, DISTij: 18274			
Year	**EXPij**	**GDPj**	**CAPj**
2008	96680170	5029291070606	3797
2009	38521490	5501980339596	4133
2010	34230577	6087163874512	4550
2011	25572341	6668538680619	4961
2012	35592365	7192934987439	5325
2013	45281126	7751549114989	5711
2014	39091755	8327160831972	6104
2015	27648717	8913503612416	6500
2016	19977136	9523968278958	6908
2017	25615698	10185617478789	7347
2018	24053284	10873123622055	7807
2019	10541276	11537484336928	8255

Country: South Korea, DISTij: 18558			
Year	**EXPij**	**GDPj**	**CAPj**
2008	42916021	1062750941696	21665
2009	4178510	1071175357672	21724
2010	2472466	1144066965324	23087
2011	89819164	1186233472871	23755
2012	27521398	1214733099700	24198
2013	41106804	1253175863016	24850
2014	48299998	1293308240994	25486
2015	33884191	1329638605060	26064
2016	57633343	1368821481990	26726
2017	92565052	1412071254753	27493
2018	27419239	1453125867702	28158
2019	82697467	1482760164323	28675

Country: Hong Kong (China), DISTij: 19115

Year	EXPij	GDPj	CAPj
2008	4518176	219543765618	31554
2009	6816470	214145031721	30711
2010	5430734	228637697575	32550
2011	14490795	239645793590	33888
2012	42313550	243720447901	34086
2013	90288196	251279570348	35003
2014	111716552	258221046638	35718
2015	48355491	264386829327	36261
2016	26951530	270122507356	36818
2017	34972388	280362944357	37929
2018	26121537	288346170949	38699
2019	11961220	284743319786	37928

Country: India, DISTij: 15532

Year	EXPij	GDPj	CAPj
2008	54050064	1431812781421	1193
2009	73791368	1544380310593	1268
2010	72018766	1675615335601	1358
2011	36958173	1763440111904	1410
2012	20303895	1859659734291	1469
2013	47437133	1978419583618	1545
2014	173562696	2125024977748	1640
2015	188239149	2294947360720	1752
2016	185681198	2484425233784	1876
2017	247572626	2659423696537	1987
2018	231400264	2822169439127	2086
2019	198314889	2940156656485	2152

Country: Indonesia, DISTij: 16133

Year	EXPij	GDPj	CAPj
2008	4222642	679403088245	2885
2009	14903590	710851782010	2979
2010	6931613	755094160363	3122
2011	26317108	801681840622	3271
2012	19362214	850023661688	3421
2013	90984765	897261717987	3563
2014	23367303	942184637117	3693
2015	30812365	988128596686	3824
2016	44048497	1037861792573	3968
2017	19173241	1090479163408	4121
2018	79645248	1146853725883	4285
2019	24226514	1204479845862	4451

Country: Israel, DISTij: 11678			
Year	**EXPij**	**GDPj**	**CAPj**
2008	87394405	219555160962	30040
2009	65806452	221584427356	29601
2010	98996854	233995676088	30694
2011	122693487	245188853424	31573
2012	120596782	250723348309	31695
2013	144897740	261123489448	32399
2014	110974589	270937032854	32978
2015	141261942	277141740528	33071
2016	150748993	288177653283	33721
2017	118893585	298369641485	34243
2018	94166042	308674441425	34750
2019	138061909	319390655678	35279

Country: Japan, DISTij: 17973			
Year	**EXPij**	**GDPj**	**CAPj**
2008	87121933	5784066298239	45166
2009	48270997	5470777391094	42725
2010	38413775	5700098114744	44508
2011	43751753	5693518985133	44539
2012	24777568	5778642194553	45277
2013	66934169	5894230516027	46249
2014	83810824	5916317345752	46484
2015	71995740	5988669235429	47103
2016	38073737	6019926762461	47403
2017	51703633	6150456276848	48511
2018	28688458	6170335002849	48766
2019	29769209	6210698351093	49188

Country: Thailand, DISTij: 17394			
Year	**EXPij**	**GDPj**	**CAPj**
2008	32965931	319473632807	4802
2009	12060421	317267289652	4745
2010	27808145	341104820155	5076
2011	18782309	343970551186	5094
2012	10340404	368883637205	5438
2013	32913044	378797368589	5559
2014	118799013	382526345001	5589
2015	23879294	394514326506	5741
2016	58382094	408043089557	5916
2017	11547932	424635143108	6135
2018	24948929	442260737640	6370
2019	43954820	452674624298	6502

Country: Vietnam, DISTij: 18263

Year	EXPij	GDPj	CAPj
2008	16257837	103355590690	1198
2009	40211260	108934619581	1251
2010	38363947	115931749697	1318
2011	66907573	123166241860	1386
2012	50721640	129629226783	1443
2013	31928779	136657571782	1506
2014	52556645	144834688913	1579
2015	66534179	154508616052	1667
2016	145600993	164104855205	1753
2017	80227783	175284081081	1853
2018	90108476	187686812137	1964
2019	67151958	200857611961	2082

Country: Paraguay

GDPi	CAPi
24550515091	4037
24487181775	3973
27215968616	4356
28372405344	4479
28219616269	4395
30595001138	4699
32082190602	4861
33070442062	4944
34496738802	5090
36205628582	5272
37420751807	5380
37409557616	5310

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