HOW EXCHANGE RATE VOLATILITY AFFECTS AGRICULTURAL EXPORTS IN NIGERIA

RESULTS AND DISCUSSION

This chapter is concerned with data analysis and presentation. It presents information of the variables and different model estimation used to examine how exchange rate volatility affects Nigeria agricultural exports (NAE). It also includes discussions explaining and relating to the objectives of the study. In the estimation, Nigeria NAEs into its various importing country markets during the period 1990-2020.

The data of GDP and population size were collected from WDI (World Bank). Data on agricultural exports were collected from the WTO (World Trade Organization). The calculation of the degree of openness was based on the data from UNCTAD and the WDI (World Development Indicators). Exchange rate data were gathered from the IMF website. The webpage of Travel Distance Calculator between Cities was used in calculating the distance between Lagos and the capital cities of the studied countries. Data on Insecurity was collected from Kneoma website based on GTI (Global Terrorism Indicator).

4.1 Description of Variables

In order to ascertain the distribution of the data being used for this analysis, some descriptive analyses were performed. But firstly, the variables were transformed to a linear form by logarithmic transformation.

Table 4.1: Descriptive Statistics

	LN_XIJ_	LN_YI_	LN_YJ_	LN_LI_	LN_LJ_	LN_OPI_	LN_OPJ_	LN_EXRIJ_	LN_DIJ_	D1I	D1J
Mean	2.556873	11.66998	12.00591	8.144675	8.066718	-0.934716	1.129538	1.927578	3.785970	0.967742	0.512903
Median	2.505150	11.68277	12.23270	8.142593	8.008809	-0.946697	1.355912	2.109415	3.856306	0.000000	0.000000
Maximum	4.219323	12.03165	13.38482	8.314161	9.149558	-0.569876	1.874005	2.554866	5.087540	2.000000	2.000000
Minimum	0.602060	11.29190	9.787017	7.978694	6.904531	-1.447625	-1.377800	0.905163	2.612784	0.000000	0.000000
Std. Dev.	0.886060	0.266104	0.921961	0.100501	0.629941	0.196395	0.762123	0.468518	0.637926	1.001096	0.774698
Skewness	-0.173210	-0.016271	-0.862222	0.034575	0.325582	-0.374502	-2.372340	-0.738844	-0.007345	0.064550	1.086354
Kurtosis	2.410909	1.402960	2.863578	1.790120	2.165514	3.340768	7.384306	2.244580	3.268735	1.004167	2.534251
Jarque-Bera	6.032536	32.95810	38.65077	18.96931	14.47160	8.746272	539.0660	35.57536	0.935607	51.66689	63.77711
Probability	0.048984	0.000000	0.000000	0.000076	0.000720	0.012612	0.000000	0.000000	0.626377	0.000000	0.000000
Sum	792.6306	3617.692	3721.831	2524.849	2500.683	-289.7619	350.1567	597.5492	1173.651	300.0000	159.0000
Sum Sq. Dev.	242.5964	21.88073	262.6538	3.121041	122.6192	11.91843	179.4771	67.82821	125.7473	309.6774	185.4484
Observations	310	310	310	310	310	310	310	310	310	310	310

Source: Author's computation using Eveiws 12.

Table 4.1 shows the descriptive statistics of the variables for the study. The results show that all variables are negatively skewed (or left-skewed) with reported values all between -0.5 and 0.5 except for D1j and D1i which are dummy variables representing insecurity in Partnering Countries and Nigeria respectively.

The kurtosis statistics revealed that the variables are leptokurtic because their values are less than 3, but variables such as real openness of Nigeria (OPJ) and partnering countries (OPI), Distance between Nigeria and partnering countries (LNDIJ) are platykurtic because its value is greater than three. Jarque-Bera statistics shows that all variables are normally distributed at 5% level of significance except distance whose probability is $0.626 > 0.05$.

The graphs below represents the linearized form of gross domestic product (figure 5; lngdp), population (figure 6; lnpop) and trade openness(figure 7; lnopj) of the ten partnering countries (China, South Africa, Russia, United States of America, United Kingdom, Niger, Japan, Ghana, Turkey, and India captured as numeral 1-10 respectively with randomly selected two-year data points)

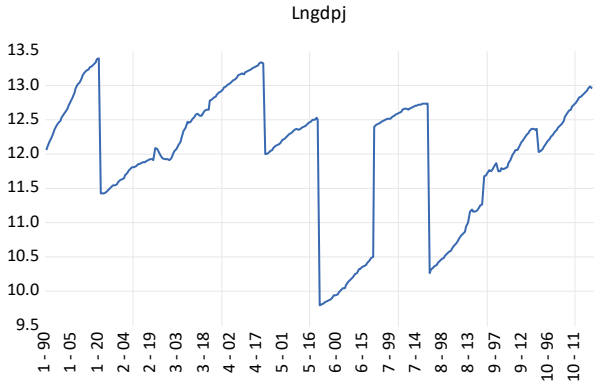

Figure (5) graph showing GDP of partnering countries

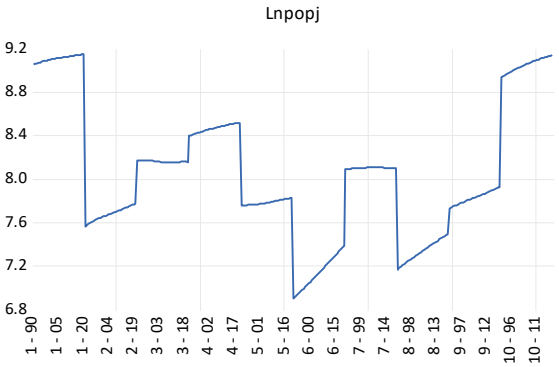

Figure (6) graph showing the population of partnering countries

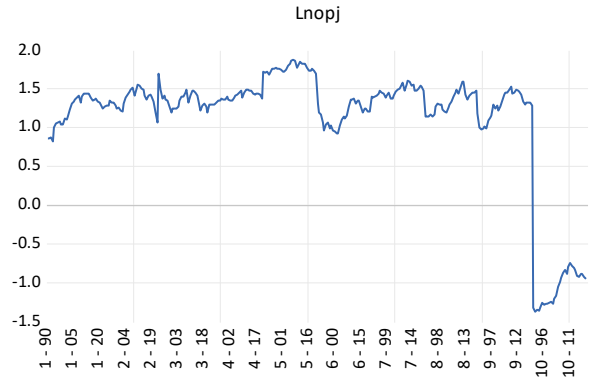

figure (7) graph showing the trade openness of partnering countries

The graphs presented below as figure 8, 9, 10, 11, 12 and 13 represents Nigeria agricultural exports, GDP, Exchange rate, population, insecurity and trade openness which are considered the major factors used in this research.

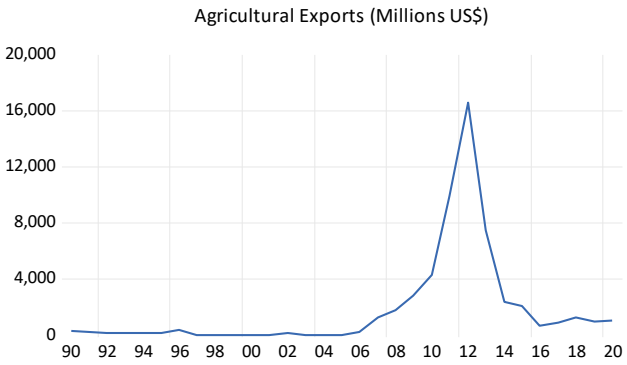

Figure (8) graph showing Nigeria's agricultural export

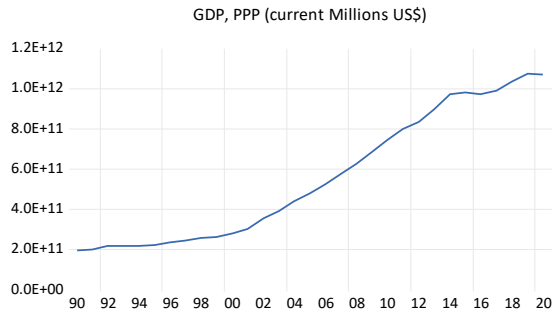

Figure (9) graph showing Nigeria's gross domestic product

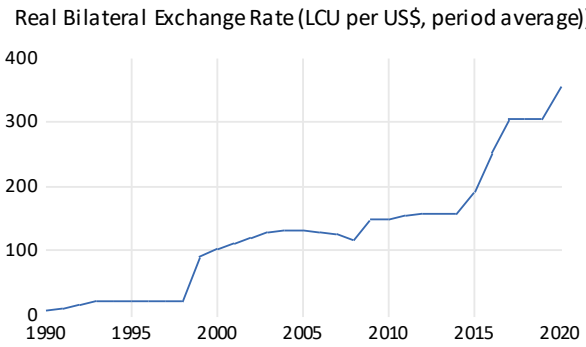

Figure (10) graph showing Nigeria's exchange rate

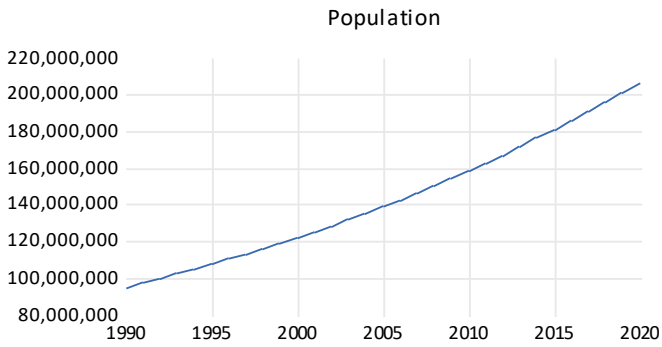

Figure (11) graph showing Nigeria's population

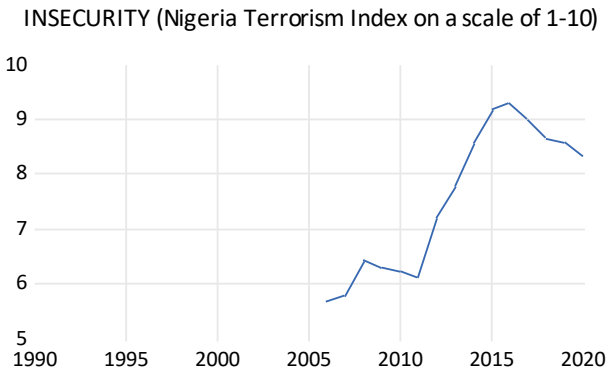

Figure (12) graph showing Nigeria's insecurity rate

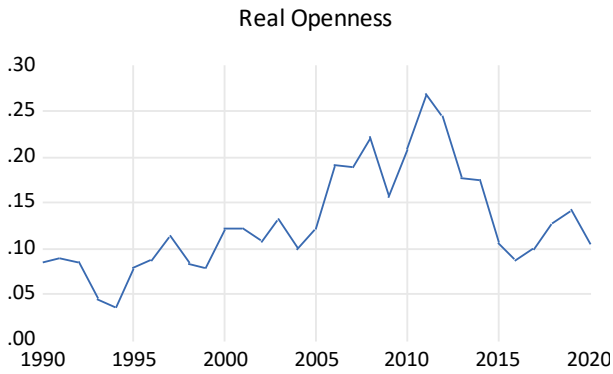

Figure (13) graph showing Nigeria's trade openness

Nigeria Agricultural Export (figure d) compared to GDP (Figure e) has been growing at a declining rate. The main reasons behind such negative performance were attributed to the increase of the share of non-agricultural exports specially petroleum and its by-products, the decrease in quality of agricultural exported products and a weak competitiveness in comparison to other competitors, and the growing domestic demand for agricultural production which consequently reduced the exportable surplus of agricultural commodities. Moreover, since the 1990 – 2006, the agricultural exports have been decreasing at an increasing dramatically until 2007. The least agricultural export was 4 million in 2001 and the highest was in 2012 at 16570 million dollars. Phenomenon like this led to the chronic deficit in agricultural trade balance.

Whereas the Nigerian monetary authorities fixed the official exchange rate at NGN423 to a dollar, there is a near 50% differential in the parallel market rate to the official rate. The fact that the exchange rate is not market determined, in that the official price of the dollar is not determined by the equilibrium of demand and supply, means that the official price of the dollar could be significantly higher or lower than its true market value (Owoo 2021).

The actual bilateral exchange rate is defined in this research as the number of the importing market units of currency that can be purchased by one Nigerian Naira. Nigeria exchange rate according to figure (f) has been increasing at a fluctuating rate.

Openness is an element that makes a difference in the formulation of gravity equations. Openness is the indicator of total exports plus total imports over GDP, Openness = (total exports + total imports)/real GDP. Nigeria economy openness as shown in figure (i) using a 5-years moving average has been increasing at a slightly slow rate with a major decline in 2016.

Insecurity in Nigeria has been of a fast increasing rate, graph (h) shows that the country insecurity increased tremendously after year 2010 Meanwhile its population (figure g) has a linear growth and growing at a geometric progression while its agricultural exports grows at an arithmetic progression.

Model Estimation

Therefore, the value of agricultural exports (Xij) from Nigeria i to its trading partners' j is defines as follows:

$lnX_{ijt} = \beta_0 + \beta_1 lnGDP_{it} + \beta_2 lnGDP_{jt} + \beta 3lnDist_{ij} + \beta 4lnPOPit + \beta 5lnPOPjt + \beta 6lnexrijt + \beta 7lnOP_{it} + \beta 8lnOP_{jt} + \beta 9lnD_{ijt} + \beta 10D1_{it} + \beta 11lnD1_{jt} + EU\ jt$ ………………………………(7)

In summary, the annual data covers 10 countries for the years 1990 to 2020 with one dependant variable and 10 explanatory variables (a total of n = 310, N = 10, and T = 31), and all variables are expressed in natural logarithm.

4.2 Results and Discussion of the Univariate Characteristics of Variables

Before the estimation of Equation, the univariate characteristics of the variables were analysed.

Table 4.2. Panel unit root test.

Test	LLC	IPS
Agricultural Exports (LnX_{ij})	-18.28(0.000)[bc]	-21.42(0.000)[bc]
Nigeria's Population (LnL_i)	-1.99(0.02)[abc]	-1.55(0.000)[b]
Partners' Population (LnL_j)	-5.22(0.000)[abc]	-5.22(0.000)[abc]
Nigeria's Openness ($LnOP_i$)	-12.89(0.003)[ab]	-16.52(0.00)[bc]

Partners' Openness ($LnOP_j$)	-11.568(0.000)^{abc}	-16.69(0.00)^{abc}
Exchange Rate ($LnExr_{ij}$)	-13.53(0.000)^{abc}	-15.28(0.000)^{abc}
Nigeria's GDP (LnY_i)	-8.99(0.00)^{ac}	-9.92(0.000)^{c}
Partners' GDP (LnY_i)	-7.16(0.000)^{abc}	-11.11(0.00)^{bc}

Notes: $^{a}/^{b}/^{c}$ denotes rejection of the null hypothesis at 10%/5%/1% level. Probabilities are in parenthesis.

The results presented in Table 4. 2 imply that both the LLC and IPS reject the null of unit root for all variables. That means all variables are stationary and this implies that co-integration test is not required and the Equation (4) can be estimated using the ordinary least square method.

4.3 Gravity model estimation Results and Discussion

Since this study deals with the agricultural export flows of Nigeria to its 10 importing markets, the fixed effects model will be a more appropriate model than the random effect specification. Furthermore, we also apply the Hausman test to check whether the fixed effects model is more efficient than the random effects model. This will be true if the null hypothesis of no correlation between the individual effects and the regressors is rejected (Hausman et.al, 2005).

To identify the factors determining Nigeria's agricultural export to ten of its partnering (trading) countries, we estimate the model using the maximum likelihood estimator of the SFGM. Alternatively, we use the FE, OLS, the PPML and the Heckman model to confirm the robustness of the results obtained from the SFGM. The results of the estimations for this study gravity model are presented in Tables 4.3. Based on the Hausman test, the FE model is preferred to the random effects model.

Table 4.3. Gravity model estimation results

Variables	SFGM ln(Xijt)	FE ln(Xijt)	OLS ln(Xijt)	PPML (Xijt)	Heckman ln(Xijt)
	Coeff. p>|z|	Coeff. p>|z|	Coeff. p>|z|	Coeff. p>|z|	Coeff. p>|z|
LnY_{it}	4.87*** (0.00)	4.84*** (0.00)	5.04*** (0.00)	9.87***(0.00)	4.95*** (0.00)
LnY_{jt}	-0.01(0.88)	-0.23(0.37)	-0.03(0.728)	-0.04*** (0.00)	0.02(0.79)
LnL_{it}	-4.75***(0.01)	-11.00***(0.00)	-11.56***(0.00)	-11.56*** (0.00)	-6.12***(0.00)
LnL_{jt}	-0.01(0.9)	-0.02(0.97)	0.002(0.86)	0.01** (0.02)	0.03(0.73)
$LnOP_{it}$	0.37(0.08	-0.11(0.5)	0.067(0.69	5.77*** (0.00)	0.99*** (0.00)
$LnOP_{jt}$	0.02(0.7)	0.36(0.18)	0.024(0.58)	0.02*** (0.00)	0.02(0.67)
$LnExr_{ijt}$	-1.04***(0.00)	-0.71***(0.00)	-0.73***(0.00)	-3.38***(0.00)	-0.83***(0.00)
LnDijt	0.00(0.1)	0.09(0.78)	0.01(0.89)	0.00*** (0.00)	0.00(0.93)
D1it	0.33*** (0.00)	0.66*** (0.00)	0.66***(0.00)	-0.015** (0.04)	
D1jt	0.31***(0.000	0.22*** (0.00)	0.19***(0.00)	0.09*** (0.00)	
*Constan*t	-11.55(0.31)	38.41*** (0.002)	38.57***(0.00)	-64.47(0.00) ***	-2.89(0.73)
LR-test	1183.88	-----	-----	-----	-----
λ	1***	-----	-----	-----	-----
Hausmann test	-----	0.000***	------	-----	------
R^2	62.6	0.81	0.81	0.77	------
No. of obs.	310	310	310	310	310

Note. *** and ** indicate statistical significance at the 1% and 5% level, respectively.
Source. Authors' calculation.

As shown in Table 4.3, regarding other variables in the extended gravity model, the coefficient of LnL_{it} is negative in all models but statistically significant in all models (SFGM, FE, PPML and Heckman estimations). An increase in Nigeria's population causes its agricultural exports to reduce. Owoo (2021) argues that population is a major obstacle for increased agricultural exports

in Nigeria. This is because there is high demand for food products in the domestic market; thus, reducing the volume of agricultural products available for exports.

The Coefficient of Population of partnering countries is positive and only significant in the PPML estimation. This agrees with the postulation that larger countries are expected to engage in more bilateral trade (Shahriar et al., 2019b).

The coefficient of LnL_{jt} is positive and not significant in all model except in the PPML estimation. This shows that an increase in the population of importing country result in an increase in Nigeria's agricultural trade. Barma (2017) documents a similar result for India and its agricultural products' trading partners.

The $LnExr_{ijt}$ is negatively and statistically significant in all models, although it maintained its negative coefficient. An increase in $LnExr_{ijt}$ results to a decrease of the Nigerian agricultural exports. This finding indicates that the appreciation of the local currency (Naira) against the importing country's currency dissuades exportation of agricultural products from Nigeria to importing countries. Currency appreciation makes agricultural products exports costlier for importing countries. The depreciation of the Nigerian currency (Naira) would improve trade (Igue and Ogunleye 2014). This agrees with Kalbasi (2001), real bilateral exchange rate was added in their empirical model as an explanatory variable in examining Mercosur-EU trade flows and stated that the expected coefficient of the actual bilateral exchange rate is to be negative.

From Tables 4.3, the signs and significance of Nigeria GDP (LnY_{it}), is positive and significant in all models and this follows the theoretical postulations of the gravity model suggests that the economic size (GDP) of both exporter influences bilateral trade between countries. An increase in

the economic size of Nigeria would promote agricultural exports in Nigeria. The larger the economic production size, the more agricultural product Nigeria will have to exports.

Coefficient of GDP of partnering countries (LnY_{jt}) is negative and only significant in the FE and PPML estimation, this would imply that as partnering countries produce more they tend to import less agricultural products.

Coefficient of Nigeria's trade openness ($LnOP_{it}$) is positive and only significant in the PPML and Heckman model estimation, this would imply that agricultural exports in Nigeria will increase as the trade openness increases.

Coefficient of Openness of partnering countries ($LnOP_{jt}$) is positive and only significant in the PPML estimation, this would imply that as partnering countries' economies are openness to trade increases, Nigeria's agricultural exports also increases..

For the distance variable (*LnDijt*), the coefficient is positive and statistically significant in the PPML estimation and this suggests that the kilometer gap between Nigeria and the importing country stimulate agricultural exports from Nigeria.

The Dummy variable, Insecurity of Nigeria (*D1it*) based on the Global Terrorism Index (GTI), coefficient of *D1it* is positive in SFGM, FE and OLS estimation is positive and significant except for the PPML estimation which is negative but significant. Considering that the PPML and Heckman model are the best gravity equations to deal with a zero trade problem and perform better when compared with other gravity specifications (Shahriar et al., 2019b). In addition, it solves the problem of zero trade, the PPML also addresses the problem of heteroscedasticity and multi-collinearity which could cause biased results when estimating log-linearized gravity models and interpreting the elasticity (Santos Silva and Tenreyro, 2011).

Therefore the PPML estimation is accepted, this suggests that there is a negative relationship between the level of insecurity in Nigeria and agricultural exports in Nigeria. An increase in agricultural exports will be dependent on reduction in terrorism (insecurity) in Nigeria.

The Dummy variables, Insecurity of partnering countries (*D1jt*) based on the Global Terrorism Index (GTI), coefficient of *D1jt* is positive in SFGM, FE, OLS and PPML estimation is positive and significant except for the Heckman model estimation which did not consider the dummy variables. This suggests that Insecurity (Terrorism) affects partnering countries production ability, therefore they depend on importing agricultural products.

The R-squared in the FE and OLS model estimation shows that eighty one percent of the dependent variable (agricultural exports) is explained by the independent variables (GDP, Population, Openness Exchange Rate, Distance and Insecurity of Nigeria and its Partnering countries) while the PPML and SFGM estimation shows that only seventy-seven and sixty-six percent respectively is explained. This could suggests that based on the constant estimation that outside the stated independent variables, other factors could as well influence agricultural exports in Nigeria.

5.1 Summary

Recognizing the importance of agricultural exports in the Nigerian economy, this study attempted to analyze Nigeria Agricultural Exports (NAE) empirically and to identify the factors influencing NAEs their exporting markets. More specifically, we employed the gravity model, which is considered one of the most efficient models in explaining bilateral trade, to NAEs covering the period 1990 to 2020 in order to investigate the factors that determine export flows of agricultural products from Nigeria to its 10 trading partners. Regression analysis was performed using the fixed effects model, OLS, PPML, and Heckman Model. When choosing between fixed and random effects, the Hausman test rejected the null hypothesis (random effects were efficient). Therefore, the research demonstrated that the fixed effects model generated the most reliable results and then interpreted the results using this model.

The following findings emerged based on a variety of estimators. We find that agricultural export trade in Nigeria is favourably determined by its economic size (GDP) and that of its trading countries (importers) as well as the importers' population. Also, we find that Nigeria's agricultural export trade is adversely influenced by the exchange rate and insecurity of Nigeria. Moreover, we find that agricultural export trade from Nigeria to its selected ten importing trading countries is relatively and largely dependent on Nigeria's openness and openness of the partnering countries.

5.2 Conclusion

In this research of how exchange rate volatility affects agricultural exports, we conclude based on the results in this study that, NAEs patterns follow the basic gravity model, implying that bilateral trade flows will increase in proportion to the trading partner's GDP and Population. Therefore, in order to expand bilateral trade flows, it appears to be more desirable for Nigeria to promote exports

to countries by trading with countries having large economies. Nigeria's exchange rate volatility and high level of insecurity affects insecurity negatively, the results suggests that depreciation in Nigeria's Naira against the currencies of its partners affects agricultural exports negatively.

5.2 Recommendation

In line with the findings of this study, I recommend the following;

- Nigeria policy should be directed towards maintaining a relatively stable exchange rate as this would facilitate agricultural export trade in Nigeria
- Agricultural exports should be stimulated by formulating and implementing macroeconomic policies aimed at increasing the economic size (domestic productivity) of Nigeria.
- Trade relationship between Nigeria and trading partner countries should be strengthened
- Issues of Insecurity should be given maximum consideration as this has adverse influence on agricultural productivity as well as agricultural product exports.
- Further research efforts should be undertaken in other to the existing body of knowledge by focusing on the agricultural imports of Nigeria.

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APPENDIX

Table4.1 Descriptive statistics

	LN_XIJ_	LN_YI_	LN_YJ_	LN_LI_	LN_LJ_	LN_OPI_	LN_OPJ_	LN_EXRIJ_	LN_DIJ_	D1I	D1J
Mean	2.556873	11.66998	12.00591	8.144675	8.066718	-0.934716	1.129538	1.927578	3.785970	0.967742	0.512903
Median	2.505150	11.68277	12.23270	8.142593	8.008809	-0.946697	1.355912	2.109415	3.856306	0.000000	0.000000
Maximum	4.219323	12.03165	13.38482	8.314161	9.149558	-0.569876	1.874005	2.554866	5.087540	2.000000	2.000000
Minimum	0.602060	11.29190	9.787017	7.978694	6.904531	-1.447625	-1.377800	0.905163	2.612784	0.000000	0.000000
Std. Dev.	0.886060	0.266104	0.921961	0.100501	0.629941	0.196395	0.762123	0.468518	0.637926	1.001096	0.774698
Skewness	-0.173210	-0.016271	-0.862222	0.034575	0.325582	-0.374502	-2.372340	-0.738844	-0.007345	0.064550	1.086354
Kurtosis	2.410909	1.402960	2.863578	1.790120	2.165514	3.340768	7.384306	2.244580	3.268735	1.004167	2.534251
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Probability	0.048984	0.000000	0.000000	0.000076	0.000720	0.012612	0.000000	0.000000	0.626377	0.000000	0.000000
Sum	792.6306	3617.692	3721.831	2524.849	2500.683	-289.7619	350.1567	597.5492	1173.651	300.0000	159.0000
Sum Sq. Dev.	242.5964	21.88073	262.6538	3.121041	122.6192	11.91843	179.4771	67.82821	125.7473	309.6774	185.4484
Observations	310	310	310	310	310	310	310	310	310	310	310

Time-invariant inefficiency model
Group variable: country

Number of obs = 300
Number of groups = 10

Obs per group: min = 30
avg = 30
max = 30

Wald chi2(11) = 914.14
Log likelihood = -182.62274 Prob > chi2 = 0.0000

L.lnxij	Coef.	Std. Err.	z	P>|z|	[99% Conf.	Interval]
lnexrij	-1.844985	.1858101	-9.93	0.000	-2.3236	-1.36637
lnyj	-.0140491	.092207	-0.15	0.879	-.2515586	.2234604
lnlj	-.0117863	.1079697	-0.11	0.913	-.2898979	.2663252
lnopj	.0194969	.0512972	0.38	0.704	-.112636	.1516297
lndij	.0003401	.0867748	0.00	0.997	-.223177	.2238572
lnli	-4.745385	2.25341	-2.11	0.035	-10.54978	1.059014
lnopi	.3738363	.218686	1.71	0.087	-.1894614	.937134
lndxij	-.2113275	.1029058	-2.05	0.040	-.4763953	.0537402
dli	.3351627	.0951927	3.52	0.000	.0899625	.5803629
dlj	.3149364	.0605418	5.20	0.000	.1589909	.4708818
lnyi	4.847522	.8446758	5.74	0.000	2.671781	7.023263
_cons	-11.55435	11.48792	-1.01	0.315	-41.14528	18.03657
/mu	-.0828434	24.34227	-0.00	0.997	-62.78437	62.61868
/lnsigma2	-1.6203	.0831709	-19.48	0.000	-1.834534	-1.406066
/ilgtgamma	-10.03841	362.5265	-0.03	0.978	-943.8449	923.7681
sigma2	.1978394	.0164545			.1596879	.2451056
gamma	.0000437	.0158371			.	1

Time-invariant inefficiency model — Number of obs = 300
Group variable: country — Number of groups = 10

Obs per group: min = 30
avg = 30
max = 30

Wald chi2(11) = 914.14
Log likelihood = -182.62274 — Prob > chi2 = 0.0000

L.lnxij	Coef.	Std. Err.	z	P>|z|	[99.9% Conf.	Interval]
lnexrij	-1.844985	.1858101	-9.93	0.000	-2.456398	-1.233572
lnyj	-.0140491	.092207	-0.15	0.879	-.3174587	.2893606
lnlj	-.0117863	.1079697	-0.11	0.913	-.3670636	.3434909
lnopj	.0194969	.0512972	0.38	0.704	-.149298	.1882917
lndij	.0003401	.0867748	0.00	0.997	-.2851947	.2858749
lnli	-4.745385	2.25341	-2.11	0.035	-12.16029	2.66952
lnopi	.3738363	.218686	1.71	0.087	-.3457557	1.093428
lndxij	-.2113275	.1029058	-2.05	0.040	-.5499419	.1272868
dli	.3351627	.0951927	3.52	0.000	.0219285	.6483969
dlj	.3149364	.0605418	5.20	0.000	.1157218	.5141509
lnyi	4.847522	.8446758	5.74	0.000	2.068093	7.62695
_cons	-11.55435	11.48792	-1.01	0.315	-49.35567	26.24696
/mu	-.0829286	24.38548	-0.00	0.997	-80.32401	80.15815
/lnsigma2	-1.6203	.0831749	-19.48	0.000	-1.893989	-1.346611
/ilgtgamma	-10.03792	362.8358	-0.03	0.978	-1203.959	1183.883
sigma2	.1978394	.0164553			.1504704	.2601204
gamma	.0000437	.0158584			.	1

Dependent Variable: LN_XIJ_
Method: Panel Least Squares
Date: 12/06/22 Time: 18:27
Sample: 1990 2020
Periods included: 31
Cross-sections included: 10
Total panel (balanced) observations: 310

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LN_YI_	5.042269	0.718974	7.013149	0.0000
LN_YJ_	-0.027775	0.079808	-0.348016	0.7281
LN_LI_	-11.55652	1.886118	-6.127145	0.0000
LN_LJ_	0.016669	0.093158	0.178931	0.8581
LN_OPI_	-0.067980	0.171610	-0.396132	0.6923
LN_OPJ_	0.024385	0.044477	0.548260	0.5839
LN_EXRIJ_	-0.727228	0.157956	-4.603990	0.0000
LN_DIJ_	0.010124	0.075675	0.133783	0.8937
D1I	0.662471	0.067317	9.841112	0.0000
D1J	0.196897	0.052901	3.721952	0.0002
C	38.56708	9.688377	3.980757	0.0001

R-squared	0.809451	Mean dependent var	2.556873
Adjusted R-squared	0.803078	S.D. dependent var	0.886060
S.E. of regression	0.393197	Akaike info criterion	1.005828
Sum squared resid	46.22660	Schwarz criterion	1.138416
Log likelihood	-144.9033	Hannan-Quinn criter.	1.058831
F-statistic	127.0147	Durbin-Watson stat	2.154059
Prob(F-statistic)	0.000000		

Dependent Variable: LN_XIJ_
Method: Panel Least Squares
Date: 12/06/22 Time: 18:32
Sample: 1990 2020
Periods included: 31
Cross-sections included: 10
Total panel (balanced) observations: 310

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LN_YI_	4.838815	0.748819	6.461930	0.0000
LN_YJ_	-0.233340	0.261843	-0.891144	0.3736
LN_LI_	-11.00362	2.042079	-5.388442	0.0000
LN_LJ_	-0.022310	0.563390	-0.039600	0.9684
LN_OPI	-0.113763	0.180211	-0.631276	0.5284
LN_OPJ_	0.367850	0.273681	1.344083	0.1800
LN_EXRIJ_	-0.707667	0.161239	-4.388938	0.0000
LN_DIJ	0.095520	0.342258	0.279087	0.7804
D1I	0.662617	0.068193	9.716829	0.0000
D1J	0.222341	0.056948	3.904294	0.0001
C	38.41570	10.17844	3.774223	0.0002

Effects Specification

Cross-section fixed (dummy variables)

R-squared	0.811668	Mean dependent var	2.556873
Adjusted R-squared	0.799329	S.D. dependent var	0.886060
S.E. of regression	0.396922	Akaike info criterion	1.052189
Sum squared resid	45.68876	Schwarz criterion	1.293259
Log likelihood	-143.0893	Hannan-Quinn criter.	1.148559
F-statistic	65.78058	Durbin-Watson stat	2.171036
Prob(F-statistic)	0.000000		

Correlated Random Effects - Hausman Test
Equation: Untitled
Test period random effects

Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Period random	339.638497	5	0.0000

Period random effects test comparisons:

Variable	Fixed	Random	Var(Diff.)	Prob.
LN_YJ	-0.000000	0.000000	0.000000	0.0000
LN_LJ_	0.000000	-0.000000	0.000000	0.0000
LN_OPJ_	0.000000	-0.000000	0.000000	0.0000
LN_DIJ_	0.000000	0.000000	0.000000	0.0038
D1J	0.000000	0.000000	0.000000	1.0000

Period random effects test equation:
Dependent Variable: LN_XIJ_
Method: Panel Least Squares
Date: 12/06/22 Time: 18:37
Sample: 1990 2020
Periods included: 31
Cross-sections included: 10
Total panel (balanced) observations: 310
WARNING: estimated coefficient covariance matrix is of reduced rank

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	2.556873	3.83E-14	6.68E+13	0.0000
LN_YI_	NA	NA	NA	NA
LN_YJ_	-6.04E-14	6.86E-15	-8.800971	0.0000
LN_LI_	NA	NA	NA	NA
LN_LJ_	1.19E-13	8.00E-15	14.91985	0.0000
LN_OPI_	NA	NA	NA	NA
LN_OPJ_	4.61E-14	3.83E-15	12.02285	0.0000
LN_EXRIJ_	NA	NA	NA	NA
LN_DIJ	1.69E-14	6.51E-15	2.600239	0.0098
D1I	NA	NA	NA	NA
D1J	0.000000	6.00E-15	0.000000	1.0000

Effects Specification

Period fixed (dummy variables)

R-squared	1.000000	Mean dependent var	2.556873
Adjusted R-squared	1.000000	S.D. dependent var	0.886060
S.E. of regression	3.37E-14	Akaike info criterion	-59.09294
Sum squared resid	3.12E-25	Schwarz criterion	-58.65902
Log likelihood	9195.406	Hannan-Quinn criter.	-58.91948
F-statistic	6.09E+27	Durbin-Watson stat	0.009537
Prob(F-statistic)	0.000000		

Dependent Variable: LN_XIJ
Method: ML Heckman Selection (Newton-Raphson / Marquardt steps)
Date: 12/06/22 Time: 18:53
Sample: 1990 2020
Included observations: 310
Selection Variable: LN_DXIJ
Convergence achieved after 4 iterations
Coefficient covariance computed using observed Hessian

Variable	Coefficient	Std. Error	t-Statistic	Prob.
Response Equation - LN_XIJ_				
LN_YI	4.784834	0.870822	5.494618	0.0000
LN_YJ_	-0.017215	0.059730	-0.288219	0.7734
LN_LI	-5.855128	1.894230	-3.091033	0.0022
LN_LJ_	0.027310	0.072304	0.377705	0.7059
LN_OPI	1.011779	0.154297	6.557333	0.0000
LN_OPJ	0.016089	0.034617	0.464762	0.6425
LN_EXRIJ_	-0.805531	0.179449	-4.488913	0.0000
LN_DIJ_	0.004740	0.056009	0.084631	0.9326
C	-2.898306	7.255126	-0.399484	0.6898
Selection Equation - LN_DXIJ_				
LN_YI_	25.59685	3.793417	6.747702	0.0000
LN_YJ_	0.079451	0.400592	0.198334	0.8429
LN_LI_	-39.32058	9.285936	-4.234423	0.0000
LN_LJ_	-0.146493	0.445719	-0.328667	0.7426
LN_OPI_	-3.940999	0.964533	-4.085915	0.0001
LN_OPJ_	-0.086540	0.212367	-0.407500	0.6839
LN_EXRIJ_	-3.876147	0.600570	-6.454118	0.0000
LN_DIJ_	0.002700	0.388607	0.006947	0.9945
C	26.74247	37.35705	0.715861	0.4747
Interaction terms				
@LOG(SIGMA)	-1.339081	0.051371	-26.06686	0.0000
TFORM(RHO)	-0.543331	0.702423	-0.773510	0.4399
SIGMA	0.262087	0.013464	19.46624	0.0000
RHO	-0.316851	0.345254	-0.917733	0.3595

Root MSE	0.225140	Mean dependent var	2.957318
S.D. dependent var	0.614282	S.E. of regression	0.232774
Akaike info criterion	0.764903	Sum squared resid	15.71330
Schwarz criterion	1.005972	Log likelihood	-98.55999
Hannan-Quinn criter.	0.861272		

Dependent Variable: XIJ
Method: ML/QML - Poisson Count (Newton-Raphson / Marquardt steps)
Date: 12/06/22 Time: 18:44
Sample: 1990 2020
Included observations: 310
Convergence achieved after 8 iterations
Coefficient covariance computed using observed Hessian

Variable	Coefficient	Std. Error	z-Statistic	Prob.
LN_YI_	9.866816	0.073309	134.5916	0.0000
LN_YJ_	-0.038777	0.005018	-7.727431	0.0000
LN_LI_	-3.992520	0.204022	-19.56906	0.0000
LN_LJ_	0.014387	0.006204	2.319228	0.0204
LN_OPI_	5.770279	0.016100	358.3913	0.0000
LN_OPJ_	0.024948	0.002957	8.438416	0.0000
LN_EXRIJ_	-3.381385	0.020360	-166.0761	0.0000
LN_DIJ_	0.020126	0.004404	4.569728	0.0000
D1I	-0.015135	0.007439	-2.034488	0.0419
D1J	0.086236	0.002443	35.30432	0.0000
C	-64.47046	0.923256	-69.82942	0.0000

R-squared	0.766956	Mean dependent var	1806.226
Adjusted R-squared	0.759162	S.D. dependent var	3487.225
S.E. of regression	1711.364	Akaike info criterion	546.4310
Sum squared resid	8.76E+08	Schwarz criterion	546.5636
Log likelihood	-84685.81	Hannan-Quinn criter.	546.4840
Restr. log likelihood	-620966.1	LR statistic	1072561.
Avg. log likelihood	-273.1800	Prob(LR statistic)	0.000000

Dependent Variable: LN_XIJ
Method: Two-Step Heckman Selection
Date: 12/06/22 Time: 18:55
Sample: 1990 2020
Included observations: 310
Selection Variable: LN_DXIJ
Coefficient covariance computed using two-step Heckman method

Variable	Coefficient	Std. Error	t-Statistic	Prob.
Response Equation - LN_XIJ_				
LN_YI	4.952802	0.902081	5.490416	0.0000
LN_YJ	-0.017083	0.064078	-0.266602	0.7900
LN_LI_	-6.124883	1.910305	-3.206232	0.0015
LN_LJ	0.026819	0.076695	0.349678	0.7268
LN_OPI	0.989928	0.163692	6.047509	0.0000
LN_OPJ_	0.015821	0.036727	0.430767	0.6670
LN_EXRIJ	-0.829541	0.201746	-4.111811	0.0001
LN_DIJ	0.004988	0.060418	0.082552	0.9343
C	-2.642732	7.557695	-0.349674	0.7268
Selection Equation - LN_DXIJ				
LN_YI	26.30787	3.744571	7.025604	0.0000
LN_YJ_	0.074448	0.403163	0.184659	0.8536
LN_LI	-41.36777	8.927532	-4.633729	0.0000
LN_LJ	-0.139654	0.446989	-0.312433	0.7549
LN_OPI_	-3.540161	0.974503	-3.632785	0.0003
LN_OPJ	-0.082595	0.213725	-0.386454	0.6994
LN_EXRIJ	-3.842609	0.615104	-6.247091	0.0000
LN_DIJ	0.006032	0.392699	0.015360	0.9878
C	35.44268	35.27137	1.004857	0.3158

Root MSE	0.224470	Mean dependent var	2.957318
S.D. dependent var	0.614282	S.E. of regression	0.232082
Akaike info criterion	2.427360	Sum squared resid	15.61996
Schwarz criterion	2.644323	Log likelihood	-358.2408
Hannan-Quinn criter.	2.514093		

Redundant Variable Test
Equation: UNTITLED
Redundant variables: D1J
Specification: LN_XIJ_ LN_YI_ LN_YJ_ LN_LI_ LN_LJ_ LN_OPI_
LN_OPJ_ LN_EXRIJ_ LN_DIJ_ D1I D1J C
Null hypothesis: D1J is not significant

	Value	df	Probability
t-statistic	3.721952	299	0.0002
F-statistic	13.85293	(1, 299)	0.0002
Likelihood ratio	13.85293	1	0.0002

F-test summary:

	Sum of Sq.	df	Mean Squares
Test Deviance	2.141718	1	2.141718
Restricted Deviance	48.36832	300	0.161228
Unrestricted Deviance	46.22660	299	0.154604
Dispersion SSR	46.22660	299	0.154604

LR test summary:

	Value
Restricted Deviance	48.36832
Unrestricted Deviance	46.22660
Dispersion	0.154604

Restricted Test Equation:
Dependent Variable: LN_XIJ_
Method: Generalized Linear Model (Newton-Raphson / Marquardt steps)
Date: 12/08/22 Time: 08:05
Sample: 1990 2020
Included observations: 310
Family: Normal
Link: Identity
Dispersion computed using Pearson Chi-Square
Convergence achieved after 0 iterations
Coefficient covariance computed using observed Hessian

Variable	Coefficient	Std. Error	z-Statistic	Prob.
LN_YI_	5.326979	0.730046	7.296769	0.0000
LN_YJ_	-0.012174	0.081387	-0.149586	0.8811
LN_LI_	-9.790587	1.864160	-5.252010	0.0000
LN_LJ_	0.014574	0.095131	0.153196	0.8782
LN_OPI_	-0.173654	0.172832	-1.004756	0.3150
LN_OPJ_	0.008643	0.045214	0.191163	0.8484
LN_EXRIJ_	-0.964612	0.147570	-6.536633	0.0000
LN_DIJ_	0.007284	0.077275	0.094257	0.9249
D1I	0.635420	0.068342	9.297687	0.0000
C	21.20570	8.671534	2.445438	0.0145

Mean dependent var	2.556873	S.D. dependent var	0.886060
Sum squared resid	48.36832	Root MSE	0.395002
Log likelihood	-152.0056	Akaike info criterion	1.045198
Schwarz criterion	1.165732	Hannan-Quinn criter.	1.093382
Deviance	48.36832	Deviance statistic	0.161228
Restr. deviance	242.5964	LR statistic	1204.682
Prob(LR statistic)	0.000000	Pearson SSR	48.36832
Pearson statistic	0.161228	Dispersion	0.161228

YEAR	Exports of goods and services (current US$)	Imports of goods and services (current US$)	GDP (current US$)	GDP, PPP (current international $)	GNI (current US$)	Official exchange rate (LCU per US$, period average)	Population, total	Insecurity	Real Openness
1990	4.49E+10	3.52E+10	3.61E+11	1.11E+12	3.62E+11	4.783208	1.14E+09		7.190477
1991	5.15E+10	4.08E+10	3.83E+11	1.26E+12	3.84E+11	5.323392	1.15E+09		7.331527
1992	5.79E+10	5.35E+10	4.27E+11	1.47E+12	4.27E+11	5.514592	1.16E+09		7.578085
1993	5.34E+10	6.18E+10	4.45E+11	1.71E+12	4.44E+11	5.761958	1.18E+09		6.720258
1994	1.05E+11	9.73E+10	5.64E+11	1.98E+12	5.63E+11	8.618743	1.19E+09		10.20072
1995	1.32E+11	1.2E+11	7.35E+11	2.24E+12	7.23E+11	8.351417	1.2E+09		11.23187
1996	1.55E+11	1.37E+11	8.64E+11	2.51E+12	8.51E+11	8.314175	1.22E+09		11.64007
1997	1.87E+11	1.45E+11	9.62E+11	2.79E+12	9.51E+11	8.289817	1.23E+09		11.90967
1998	1.89E+11	1.45E+11	1.03E+12	3.04E+12	1.01E+12	8.278958	1.24E+09		10.97257
1999	1.99E+11	1.68E+11	1.09E+12	3.32E+12	1.08E+12	8.27825	1.25E+09		11.04688
2000	2.53E+11	2.24E+11	1.21E+12	3.68E+12	1.2E+12	8.278504	1.26E+09		12.96082
2001	2.72E+11	2.44E+11	1.34E+12	4.08E+12	1.32E+12	8.277068	1.27E+09		12.64669
2002	3.33E+11	2.96E+11	1.47E+12	4.52E+12	1.46E+12	8.276958	1.28E+09		13.89995
2003	4.48E+11	4.12E+11	1.66E+12	5.07E+12	1.65E+12	8.277037	1.29E+09		16.94883
2004	6.07E+11	5.56E+11	1.96E+12	5.74E+12	1.95E+12	8.276801	1.3E+09		20.27816
2005	7.73E+11	6.49E+11	2.29E+12	6.59E+12	2.27E+12	8.194317	1.3E+09		21.57193
2006	9.92E+11	7.83E+11	2.75E+12	7.66E+12	2.75E+12	7.973438	1.31E+09		23.16637
2007	1.26E+12	9.5E+11	3.55E+12	8.99E+12	3.56E+12	7.607533	1.32E+09		24.5709
2008	1.5E+12	1.15E+12	4.59E+12	1E+13	4.62E+12	6.948655	1.32E+09		26.35622
2009	1.26E+12	1.04E+12	5.1E+12	1.11E+13	5.09E+12	6.831416	1.33E+09		20.84807
2010	1.65E+12	1.43E+12	6.09E+12	1.24E+13	6.06E+12	6.770269	1.34E+09	5.59	24.93692
2011	2.01E+12	1.83E+12	7.55E+12	1.38E+13	7.48E+12	6.461461	1.35E+09	5.03	27.67696
2012	2.18E+12	1.94E+12	8.53E+12	1.51E+13	8.51E+12	6.312333	1.35E+09	4.99	27.22923
2013	2.35E+12	2.12E+12	9.57E+12	1.62E+13	9.49E+12	6.195758	1.36E+09	4.59	27.64046
2014	2.46E+12	2.24E+12	1.05E+13	1.71E+13	1.05E+13	6.143434	1.37E+09	5.21	27.47533
2015	2.36E+12	2E+12	1.11E+13	1.78E+13	1.1E+13	6.227489	1.38E+09	6.21	24.52892
2016	2.2E+12	1.94E+12	1.12E+13	1.87E+13	1.12E+13	6.644478	1.39E+09	6.11	22.14852
2017	2.42E+12	2.21E+12	1.23E+13	1.99E+13	1.23E+13	6.758755	1.4E+09	5.54	23.2951
2018	2.66E+12	2.56E+12	1.39E+13	2.17E+13	1.38E+13	6.615957	1.4E+09	5.11	24.01347
2019	2.63E+12	2.5E+12	1.43E+13	2.34E+13	1.42E+13	6.908385	1.41E+09	4.47	21.86291
2020	2.72E+12	2.36E+12	1.47E+13	2.43E+13	1.46E+13	6.900767	1.41E+09	3.59	20.94492

COUNTRY 2: SOUTH AFRICA

YEAR	Exports of goods and services (current US$)	Imports of goods and services (current US$)	GDP (current US$)	GDP, PPP (current international $)	GNI (current US$)	Official exchange rate (LCU per US$, period average)	Population, total	Insecurity	Real Openness
1990	2.71E+10	2.1E+10	1.26E+11	2.6E+11	1.22E+11	2.587321	36800507		18.52471
1991	2.61E+10	2.1E+10	1.35E+11	2.66E+11	1.32E+11	2.761315	37718952		17.7258
1992	2.79E+10	2.26E+10	1.47E+11	2.66E+11	1.44E+11	2.852014	38672611		18.93949
1993	2.93E+10	2.32E+10	1.47E+11	2.76E+11	1.45E+11	3.267742	39633754		19.03963
1994	3E+10	2.7E+10	1.54E+11	2.91E+11	1.51E+11	3.550798	40564061		19.58611
1995	3.44E+10	3.34E+10	1.72E+11	3.06E+11	1.69E+11	3.627085	41435761		22.14128
1996	3.55E+10	3.33E+10	1.63E+11	3.25E+11	1.6E+11	4.299349	42241007		21.181
1997	3.66E+10	3.49E+10	1.69E+11	3.39E+11	1.66E+11	4.607962	42987456		21.05872
1998	3.45E+10	3.29E+10	1.53E+11	3.45E+11	1.5E+11	5.528284	43682259		19.52861
1999	3.37E+10	3.03E+10	1.52E+11	3.58E+11	1.48E+11	6.109484	44338551		17.87388
2000	3.7E+10	3.31E+10	1.52E+11	3.82E+11	1.49E+11	6.939828	44967713		18.37489
2001	3.57E+10	3.09E+10	1.35E+11	4.01E+11	1.32E+11	8.609181	45571272		16.61214
2002	3.67E+10	3.23E+10	1.29E+11	4.22E+11	1.26E+11	10.54075	46150913		16.34807
2003	4.71E+10	4.3E+10	1.97E+11	4.43E+11	1.92E+11	7.564749	46719203		20.32592
2004	5.82E+10	5.85E+10	2.56E+11	4.76E+11	2.51E+11	6.459693	47291610		24.53807
2005	6.82E+10	6.88E+10	2.89E+11	5.17E+11	2.84E+11	6.359328	47880595		26.51787
2006	7.93E+10	8.41E+10	3.04E+11	5.62E+11	2.99E+11	6.771549	48489464		29.04879
2007	9.31E+10	9.71E+10	3.33E+11	6.09E+11	3.23E+11	7.045365	49119766		31.26362
2008	1.02E+11	1.07E+11	3.16E+11	6.4E+11	3.07E+11	8.261223	49779472		32.5853
2009	8.24E+10	8.11E+10	3.3E+11	6.34E+11	3.23E+11	8.473674	50477013		25.78072
2010	1.08E+11	1.03E+11	4.17E+11	6.61E+11	4.09E+11	7.321222	51216967	0.29	31.80826
2011	1.27E+11	1.23E+11	4.58E+11	6.97E+11	4.47E+11	7.261132	52003759	0.14	35.94187
2012	1.18E+11	1.24E+11	4.34E+11	6.98E+11	4.24E+11	8.209969	52832659	0.05	34.58091
2013	1.14E+11	1.22E+11	4.01E+11	7.31E+11	3.91E+11	9.655056	53687125	2.35	32.30884
2014	1.11E+11	1.16E+11	3.81E+11	7.42E+11	3.72E+11	10.85266	54544184	3.04	30.57109
2015	9.61E+10	1.01E+11	3.47E+11	7.59E+11	3.39E+11	12.75893	55386369	4.23	25.91602
2016	9.11E+10	8.96E+10	3.24E+11	7.73E+11	3.15E+11	14.70961	56207649	3.53	23.39108
2017	1.04E+11	9.99E+10	3.81E+11	7.9E+11	3.71E+11	13.3238	57009751	4.09	25.84406
2018	1.11E+11	1.09E+11	4.05E+11	8.21E+11	3.94E+11	13.23393	57792520	4.26	26.87543
2019	1.06E+11	1.04E+11	3.88E+11	8.37E+11	3.78E+11	14.44843	58558267	4.51	25.10622
2020	9.32E+10	7.83E+10	3.35E+11	7.92E+11	3.3E+11	16.45911	59308690	4.36	21.64505

COUNTRY 3: RUSSIA

YEAR	Exports of goods and services (current US$)	Imports of goods and services (current US$)	GDP (current US$)	GDP, PPP (current international $)	GNI (current US$)	Official exchange rate (LCU per US$, period average)	Population, total	Insecurity	Real Openess
1990	9.39E+10	9.27E+10	5.17E+11	1.19E+12	5.16E+11	..	1.48E+08		15.70933
1991	6.87E+10	6.73E+10	5.18E+11	1.17E+12	5.17E+11	..	1.48E+08		11.66326
1992	2.87E+11	2.22E+11	4.6E+11	1.02E+12	4.56E+11	..	1.49E+08		49.93257
1993	1.66E+11	1.33E+11	4.35E+11	9.53E+11	4.31E+11	0.991667	1.48E+08		31.3626
1994	1.1E+11	9.16E+10	3.95E+11	8.51E+11	3.93E+11	..	1.48E+08		23.65441
1995	1.16E+11	1.02E+11	3.96E+11	8.33E+11	3.92E+11	..	1.48E+08		26.20669
1996	1.02E+11	8.56E+10	3.92E+11	8.18E+11	3.86E+11	5.120833	1.48E+08		22.96248
1997	1E+11	9.12E+10	4.05E+11	8.43E+11	3.96E+11	5.784833	1.48E+08		22.69656
1998	8.46E+10	6.65E+10	2.71E+11	8.07E+11	2.59E+11	9.705083	1.48E+08		18.72522
1999	8.47E+10	5.13E+10	1.96E+11	8.71E+11	1.88E+11	24.6199	1.47E+08		15.61389
2000	1.14E+11	6.24E+10	2.6E+11	1E+12	2.53E+11	28.12917	1.47E+08		17.67441
2001	1.13E+11	7.43E+10	3.07E+11	1.07E+12	3.02E+11	29.16853	1.46E+08		17.43622
2002	1.22E+11	8.44E+10	3.45E+11	1.17E+12	3.39E+11	31.34848	1.45E+08		17.64345
2003	1.52E+11	1.03E+11	4.3E+11	1.34E+12	4.17E+11	30.69203	1.45E+08		19.00841
2004	2.03E+11	1.31E+11	5.91E+11	1.47E+12	5.78E+11	28.81374	1.44E+08		22.69724
2005	2.69E+11	1.64E+11	7.64E+11	1.7E+12	7.45E+11	28.28444	1.44E+08		25.53731
2006	3.34E+11	2.08E+11	9.9E+11	2.13E+12	9.61E+11	27.19096	1.43E+08		25.39965
2007	3.92E+11	2.8E+11	1.3E+12	2.38E+12	1.27E+12	25.58085	1.43E+08		28.26669
2008	5.2E+11	3.67E+11	1.66E+12	2.88E+12	1.61E+12	24.85288	1.43E+08		30.80399
2009	3.42E+11	2.51E+11	1.22E+12	2.77E+12	1.18E+12	31.74036	1.43E+08		21.38946
2010	4.46E+11	3.22E+11	1.52E+12	2.93E+12	1.48E+12	30.36792	1.43E+08	6.13	26.23433
2011	5.74E+11	4.09E+11	2.05E+12	3.26E+12	1.99E+12	29.38234	1.43E+08	6.63	30.15257
2012	5.94E+11	4.47E+11	2.21E+12	3.48E+12	2.14E+12	30.83983	1.43E+08	7.07	29.91818
2013	5.92E+11	4.69E+11	2.29E+12	3.74E+12	2.21E+12	31.83714	1.44E+08	6.52	28.35868
2014	5.58E+11	4.26E+11	2.06E+12	3.76E+12	1.99E+12	38.37821	1.44E+08	6.76	26.15481
2015	3.91E+11	2.82E+11	1.36E+12	3.53E+12	1.33E+12	60.93765	1.44E+08	6.29	19.08566
2016	3.3E+11	2.64E+11	1.28E+12	3.54E+12	1.24E+12	67.05593	1.44E+08	5.43	16.78274
2017	4.11E+11	3.27E+11	1.57E+12	3.81E+12	1.53E+12	58.3428	1.44E+08	5.33	19.38299
2018	5.1E+11	3.45E+11	1.66E+12	4.23E+12	1.62E+12	62.66813	1.44E+08	5.23	20.20079
2019	4.81E+11	3.52E+11	1.69E+12	4.41E+12	1.64E+12	64.73766	1.44E+08	4.9	18.88786
2020	3.8E+11	3.04E+11	1.49E+12	4.38E+12	1.45E+12	72.10491	1.44E+08	4.54	15.61252

COUNTRY 4: UNITED STATES OF AMERICA

YEAR	Exports of goods and services (current US$)	Imports of goods and services (current US$)	GDP (current US$)	GDP, PPP (current international $)	GNI (current US$)	Official exchange rate (LCU per US$, period average)	Population, total	Insecurity	Real Openness
1990	5.52E+11	6.3E+11	5.96E+12	5.96E+12	5.9E+12	1	2.5E+08		19.81505
1991	5.95E+11	6.24E+11	6.16E+12	6.16E+12	6.1E+12	1	2.53E+08		19.78645
1992	6.33E+11	6.68E+11	6.52E+12	6.52E+12	6.44E+12	1	2.57E+08		19.95059
1993	6.55E+11	7.2E+11	6.86E+12	6.86E+12	6.73E+12	1	2.6E+08		20.04462
1994	7.21E+11	8.13E+11	7.29E+12	7.29E+12	7.17E+12	1	2.63E+08		21.05546
1995	8.13E+11	9.03E+11	7.64E+12	7.64E+12	7.57E+12	1	2.66E+08		22.45338
1996	8.68E+11	9.64E+11	8.07E+12	8.07E+12	8.05E+12	1	2.69E+08		22.68707
1997	9.54E+11	1.06E+12	8.58E+12	8.58E+12	8.59E+12	1	2.73E+08		23.42832
1998	9.53E+11	1.12E+12	9.06E+12	9.06E+12	9.14E+12	1	2.76E+08		22.82589
1999	9.93E+11	1.25E+12	9.63E+12	9.63E+12	9.69E+12	1	2.79E+08		23.31356
2000	1.1E+12	1.48E+12	1.03E+13	1.03E+13	1.04E+13	1	2.82E+08		25.103
2001	1.03E+12	1.4E+12	1.06E+13	1.06E+13	1.07E+13	1	2.85E+08		22.96718
2002	9.98E+11	1.44E+12	1.09E+13	1.09E+13	1.11E+13	1	2.88E+08		22.28637
2003	1.04E+12	1.56E+12	1.15E+13	1.15E+13	1.15E+13	1	2.9E+08		22.62731
2004	1.18E+12	1.81E+12	1.22E+13	1.22E+13	1.23E+13	1	2.93E+08		24.44806
2005	1.3E+12	2.04E+12	1.3E+13	1.3E+13	1.32E+13	1	2.96E+08		25.63855
2006	1.47E+12	2.26E+12	1.38E+13	1.38E+13	1.41E+13	1	2.98E+08		26.97528
2007	1.66E+12	2.4E+12	1.45E+13	1.45E+13	1.46E+13	1	3.01E+08		28.01202
2008	1.84E+12	2.58E+12	1.48E+13	1.48E+13	1.47E+13	1	3.04E+08		29.8678
2009	1.58E+12	2E+12	1.45E+13	1.45E+13	1.44E+13	1	3.07E+08		24.75953
2010	1.86E+12	2.39E+12	1.5E+13	1.5E+13	1.52E+13	1	3.09E+08	3.9	28.2199
2011	2.12E+12	2.7E+12	1.56E+13	1.56E+13	1.58E+13	1	3.12E+08	3.8	30.84249
2012	2.22E+12	2.77E+12	1.63E+13	1.63E+13	1.67E+13	1	3.14E+08	3.57	30.68184
2013	2.29E+12	2.77E+12	1.68E+13	1.68E+13	1.72E+13	1	3.16E+08	3.74	30.00237
2014	2.38E+12	2.89E+12	1.76E+13	1.76E+13	1.8E+13	1	3.18E+08	4.71	29.998
2015	2.27E+12	2.79E+12	1.82E+13	1.82E+13	1.87E+13	1	3.21E+08	4.61	27.81223
2016	2.23E+12	2.74E+12	1.87E+13	1.87E+13	1.9E+13	1	3.23E+08	4.88	26.587
2017	2.38E+12	2.92E+12	1.95E+13	1.95E+13	1.99E+13	1	3.25E+08	5.43	27.24616
2018	2.53E+12	3.13E+12	2.05E+13	2.05E+13	2.09E+13	1	3.27E+08	6.07	27.58886
2019	2.52E+12	3.12E+12	2.14E+13	2.14E+13	2.17E+13	1	3.28E+08	5.69	26.36892
2020	2.12E+12	2.77E+12	2.09E+13	2.09E+13	2.13E+13	1	3.32E+08	5.26	23.44246

COUNTRY 5: UNITED KINGDOM

YEAR	Exports of goods and services (current US$)	Imports of goods and services (current US$)	GDP (current US$)	GDP, PPP (current international $)	GNI (current US$)	Official exchange rate (LCU per US$, period average)	Population, total	Insecurity	Real Openness
1990	2.52E+11	2.72E+11	1.09E+12	9.78E+11	1.12E+12	0.563177	57247586		53.62353
1991	2.55E+11	2.59E+11	1.14E+12	1E+12	1.17E+12	0.567015	57424897		51.48718
1992	2.68E+11	2.76E+11	1.18E+12	1.03E+12	1.22E+12	0.569774	57580402		52.88905
1993	2.61E+11	2.64E+11	1.06E+12	1.08E+12	1.1E+12	0.666757	57718614		48.72498
1994	2.94E+11	2.94E+11	1.14E+12	1.14E+12	1.2E+12	0.653427	57865745		51.48273
1995	3.43E+11	3.39E+11	1.35E+12	1.2E+12	1.3E+12	0.633668	58019030		56.99005
1996	3.7E+11	3.67E+11	1.42E+12	1.28E+12	1.37E+12	0.640958	58166950		57.71227
1997	3.98E+11	3.93E+11	1.56E+12	1.34E+12	1.54E+12	0.610836	58316954		58.80525
1998	3.99E+11	4.11E+11	1.65E+12	1.39E+12	1.66E+12	0.603824	58487141		58.47599
1999	4.04E+11	4.28E+11	1.69E+12	1.44E+12	1.68E+12	0.618057	58682466		57.90478
2000	4.2E+11	4.47E+11	1.66E+12	1.56E+12	1.67E+12	0.660931	58892514		55.60166
2001	4.16E+11	4.5E+11	1.64E+12	1.64E+12	1.66E+12	0.694655	59119673		52.67139
2002	4.33E+11	4.8E+11	1.78E+12	1.73E+12	1.81E+12	0.667223	59370479		52.95992
2003	4.92E+11	5.38E+11	2.06E+12	1.81E+12	2.08E+12	0.612473	59647577		56.9033
2004	5.77E+11	6.39E+11	2.42E+12	1.92E+12	2.45E+12	0.54618	59987905		63.20581
2005	6.38E+11	6.97E+11	2.54E+12	1.98E+12	2.58E+12	0.549998	60401206		67.49734
2006	7.41E+11	7.97E+11	2.72E+12	2.12E+12	2.72E+12	0.543487	60846820		72.5417
2007	7.87E+11	8.51E+11	3.11E+12	2.19E+12	3.09E+12	0.499772	61322463		74.81774
2008	7.96E+11	8.56E+11	2.94E+12	2.28E+12	2.91E+12	0.543966	61806995		72.51833
2009	6.39E+11	6.75E+11	2.43E+12	2.19E+12	2.41E+12	0.641919	62276270		59.92826
2010	7.02E+11	7.49E+11	2.49E+12	2.3E+12	2.49E+12	0.647179	62766365	4.01	63.21059
2011	8.22E+11	8.48E+11	2.67E+12	2.36E+12	2.68E+12	0.624141	63258810	4.11	70.62548
2012	8.14E+11	8.48E+11	2.72E+12	2.45E+12	2.69E+12	0.633047	63700215	4.51	67.72602
2013	8.35E+11	8.71E+11	2.8E+12	2.58E+12	2.75E+12	0.639661	64128273	4.29	66.14305
2014	8.68E+11	9.22E+11	3.09E+12	2.69E+12	3.02E+12	0.60773	64602298	5.17	66.63897
2015	8.04E+11	8.49E+11	2.96E+12	2.79E+12	2.89E+12	0.654545	65116219	5.61	59.16297
2016	7.68E+11	8.13E+11	2.72E+12	2.93E+12	2.65E+12	0.740634	65611593	5.08	53.99907
2017	8.11E+11	8.45E+11	2.7E+12	3.06E+12	2.66E+12	0.776977	66058859	5.1	54.05841
2018	8.85E+11	9.23E+11	2.9E+12	3.16E+12	2.86E+12	0.749532	66460344	5.61	57.17104
2019	8.93E+11	9.19E+11	2.88E+12	3.28E+12	2.86E+12	0.783445	66836327	5.41	55.26566
2020	7.82E+11	7.74E+11	2.76E+12	3.12E+12	2.72E+12	0.78	67081000	5.16	49.84476

COUNTRY 6: NIGER

YEAR	Exports of goods and services (current US$)	Imports of goods and services (current US$)	GDP (current US$)	GDP, PPP (current international $)	GNI (current US$)	Official exchange rate (LCU per US$, period average)	Population, total	Insecurity	Real-Openness
1990	5.29E+08	7.22E+08	3.51E+09	6.12E+09	3.54E+09	272.2648	8026592		20.4285
1991	3.95E+08	6.02E+08	3.29E+09	6.3E+09	3.31E+09	282.1069	8288739		15.81445
1992	3.99E+08	5.73E+08	3.39E+09	6.58E+09	3.41E+09	264.6918	8566773		14.78299
1993	3.33E+08	4.64E+08	3.05E+09	6.75E+09	3.08E+09	283.1626	8860297		11.7977
1994	2.55E+08	3.97E+08	1.94E+09	7.03E+09	1.95E+09	555.2047	9168316		9.280934
1995	3.35E+08	4.66E+08	2.3E+09	7.35E+09	2.32E+09	499.1484	9490289		10.89649
1996	3.68E+08	5.11E+08	2.41E+09	7.49E+09	2.46E+09	511.5524	9826600		11.73471
1997	3.1E+08	4.5E+08	2.29E+09	7.74E+09	2.34E+09	583.6694	10178196		9.820966
1998	3.69E+08	5.56E+08	2.64E+09	8.6E+09	2.74E+09	589.9518	10545720		10.75919
1999	3.21E+08	4.75E+08	2.54E+09	8.71E+09	2.64E+09	615.4733	10929922		9.145982
2000	3.21E+08	4.57E+08	2.24E+09	8.8E+09	2.34E+09	710.208	11331561		8.847403
2001	3.29E+08	4.79E+08	2.45E+09	9.65E+09	2.56E+09	732.3977	11751364		8.379613
2002	3.32E+08	5.26E+08	2.78E+09	1.03E+10	2.92E+09	693.7132	12189988		8.345382
2003	4.51E+08	6.83E+08	3.39E+09	1.07E+10	3.56E+09	579.8974	12647983		10.57926
2004	5.36E+08	8.54E+08	3.76E+09	1.1E+10	3.99E+09	527.338	13125914		12.59353
2005	6.32E+08	1.05E+09	4.38E+09	1.22E+10	4.66E+09	527.2584	13624474		13.75728
2006	6.6E+08	1.08E+09	4.76E+09	1.33E+10	5.05E+09	522.4256	14143969		13.02296
2007	7.49E+08	1.29E+09	5.73E+09	1.41E+10	6.07E+09	478.6337	14685404		14.39723
2008	9.62E+08	1.94E+09	7.3E+09	1.55E+10	7.69E+09	446	15250913		18.67453
2009	1.1E+09	2.54E+09	7.35E+09	1.59E+10	7.76E+09	470.2934	15843131		22.85949
2010	1.27E+09	2.81E+09	7.85E+09	1.75E+10	8.28E+09	494.7943	16464025	3.65	23.30759
2011	1.34E+09	3.07E+09	8.77E+09	1.83E+10	9.33E+09	471.2486	17114770	3.09	24.11064
2012	1.52E+09	2.73E+09	9.43E+09	2.06E+10	9.75E+09	510.5563	17795209	3.27	20.61334
2013	1.74E+09	3E+09	1.02E+10	2.09E+10	1.06E+10	493.8996	18504287	1.9	22.69153
2014	1.73E+09	3.24E+09	1.09E+10	2.2E+10	1.14E+10	493.7573	19240182	2.59	22.60409
2015	1.38E+09	2.95E+09	9.68E+09	2.29E+10	1.02E+10	591.2117	20001663	3.49	18.90749
2016	1.27E+09	2.53E+09	1.04E+10	2.4E+10	1.07E+10	592.6056	20788789	6.68	15.82526
2017	1.49E+09	2.94E+09	1.12E+10	2.51E+10	1.16E+10	580.6567	21602388	6.32	17.60849
2018	1.52E+09	3.37E+09	1.28E+10	2.76E+10	1.34E+10	555.4465	22442831	6	17.70759
2019	1.48E+09	3.4E+09	1.29E+10	2.97E+10	1.35E+10	585.911	23310719	5.6	16.37672
2020	1.41E+09	3.56E+09	1.37E+10	3.12E+10	1.32E+10	575.586	24206636	5.62	15.94239

COUNTRY 7: JAPAN

YEAR	Exports of goods and services (current US$)	Imports of goods and services (current US$)	GDP (current US$)	GDP, PPP (current international $)	GNI (current US$)	Official exchange rate (LCU per US$, period average)	Population, total	Insecurity	Real Openness
1990	3.2E+11	2.96E+11	3.13E+12	2.47E+12	3.16E+12	144.7925	1.23E+08		24.97827
1991	3.51E+11	2.97E+11	3.58E+12	2.64E+12	3.61E+12	134.7067	1.24E+08		24.57105
1992	3.79E+11	2.99E+11	3.91E+12	2.72E+12	3.94E+12	126.6513	1.24E+08		24.90852
1993	4.04E+11	3.09E+11	4.45E+12	2.77E+12	4.49E+12	111.1978	1.25E+08		25.7553
1994	4.42E+11	3.48E+11	5E+12	2.86E+12	5.04E+12	102.2078	1.25E+08		27.66283
1995	4.89E+11	4.2E+11	5.55E+12	2.99E+12	5.59E+12	94.05958	1.25E+08		30.36178
1996	4.59E+11	4.4E+11	4.92E+12	3.14E+12	4.98E+12	108.7791	1.26E+08		28.58498
1997	4.66E+11	4.22E+11	4.49E+12	3.23E+12	4.55E+12	120.9909	1.26E+08		27.51943
1998	4.25E+11	3.54E+11	4.1E+12	3.22E+12	4.15E+12	130.9053	1.26E+08		24.15355
1999	4.55E+11	3.86E+11	4.64E+12	3.26E+12	4.69E+12	113.9068	1.27E+08		25.78424
2000	5.2E+11	4.52E+11	4.97E+12	3.46E+12	5.04E+12	107.7655	1.27E+08		28.0807
2001	4.41E+11	4.15E+11	4.37E+12	3.55E+12	4.44E+12	121.5289	1.27E+08		24.08428
2002	4.54E+11	4.01E+11	4.18E+12	3.65E+12	4.24E+12	125.388	1.27E+08		23.44538
2003	5.18E+11	4.46E+11	4.52E+12	3.75E+12	4.59E+12	115.9335	1.28E+08		25.67576
2004	6.26E+11	5.32E+11	4.89E+12	3.94E+12	4.99E+12	108.1926	1.28E+08		29.39673
2005	6.68E+11	6E+11	4.83E+12	4.11E+12	4.94E+12	110.2182	1.28E+08		30.83104
2006	7.2E+11	6.61E+11	4.6E+12	4.3E+12	4.72E+12	116.2993	1.28E+08		32.11974
2007	7.92E+11	7.11E+11	4.58E+12	4.48E+12	4.72E+12	117.7535	1.28E+08		33.53169
2008	8.8E+11	8.63E+11	5.11E+12	4.52E+12	5.24E+12	103.3595	1.28E+08		38.58268
2009	6.57E+11	6.33E+11	5.29E+12	4.3E+12	5.42E+12	93.57009	1.28E+08		30.03323
2010	8.59E+11	7.82E+11	5.76E+12	4.53E+12	5.91E+12	87.77988	1.28E+08	0.46	36.26745
2011	9.21E+11	9.61E+11	6.23E+12	4.63E+12	6.41E+12	79.80702	1.28E+08	0.23	40.65529
2012	9.04E+11	1.01E+12	6.27E+12	4.8E+12	6.45E+12	79.79046	1.28E+08	0.06	39.82084
2013	8.23E+11	9.48E+11	5.21E+12	5.02E+12	5.39E+12	97.59566	1.27E+08	0.06	35.2694
2014	8.53E+11	9.8E+11	4.9E+12	5.03E+12	5.08E+12	105.9448	1.27E+08	0.01	36.40941
2015	7.75E+11	8E+11	4.44E+12	5.2E+12	4.62E+12	121.044	1.27E+08	0	30.28364
2016	8.03E+11	7.63E+11	5E+12	5.16E+12	5.18E+12	108.7929	1.27E+08	2.45	30.36817
2017	8.67E+11	8.3E+11	4.93E+12	5.26E+12	5.11E+12	112.1661	1.27E+08	3.6	32.25523
2018	9.23E+11	9.22E+11	5.04E+12	5.34E+12	5.23E+12	110.4232	1.27E+08	2.93	34.55385
2019	8.94E+11	9.09E+11	5.12E+12	5.35E+12	5.32E+12	109.0097	1.27E+08	2.29	33.66176
2020	7.84E+11	7.96E+11	5.04E+12	5.32E+12	5.22E+12	106.7746	1.26E+08	2.01	29.73336

COUNTRY 8: GHANA

YEAR	Exports of goods and services (current US$)	Imports of goods and services (current US$)	GDP (current US$)	GDP, PPP (current international $)	GNI (current US$)	Official exchange rate (LCU per US$, period average)	Population, total	Insecurity	Real Openness
1990	9.94E+08	1.52E+09	5.89E+09	1.83E+10	5.78E+09	0.032616	14773274		13.78077
1991	1.12E+09	1.68E+09	6.6E+09	1.99E+10	6.47E+09	0.036763	15207360		14.10242
1992	1.1E+09	1.85E+09	6.41E+09	2.11E+10	6.31E+09	0.043685	15653345		13.97048
1993	1.21E+09	2.17E+09	5.97E+09	2.27E+10	5.85E+09	0.064871	16106756		14.91755
1994	1.38E+09	2E+09	5.44E+09	2.39E+10	5.33E+09	0.095568	16561677		14.12131
1995	1.58E+09	2.13E+09	6.47E+09	2.54E+10	6.33E+09	0.119914	17014058		14.60568
1996	2.23E+09	2.78E+09	6.93E+09	2.71E+10	6.79E+09	0.163547	17462504		18.49473
1997	2.23E+09	3.65E+09	6.89E+09	2.87E+10	6.76E+09	0.204796	17908977		20.50816
1998	2.53E+09	3.5E+09	7.48E+09	3.04E+10	7.33E+09	0.231166	18357159		19.84445
1999	2.48E+09	3.83E+09	7.72E+09	3.22E+10	7.56E+09	0.266643	18812369		19.60653
2000	2.43E+09	3.35E+09	4.98E+09	3.41E+10	4.84E+09	0.544919	19278850		16.95098
2001	2.4E+09	3.44E+09	5.31E+09	3.63E+10	5.21E+09	0.716305	19756929		16.12215
2002	2.63E+09	3.38E+09	6.17E+09	3.85E+10	6.04E+09	0.792417	20246376		15.61364
2003	3.1E+09	4.32E+09	7.63E+09	4.13E+10	7.47E+09	0.866764	20750308		17.9777
2004	3.49E+09	5.36E+09	8.88E+09	4.48E+10	8.68E+09	0.899495	21272328		19.76489
2005	3.92E+09	6.63E+09	1.07E+10	4.89E+10	1.06E+10	0.905209	21814648		21.56363
2006	5.15E+09	8.33E+09	2.04E+10	5.37E+10	2.03E+10	0.915107	22379057		25.11485
2007	6.09E+09	1.01E+10	2.48E+10	5.75E+10	2.47E+10	0.932619	22963946		28.22
2008	7.18E+09	1.28E+10	2.87E+10	6.4E+10	2.86E+10	1.052275	23563832		31.16759
2009	7.63E+09	1.1E+10	2.6E+10	6.75E+10	2.6E+10	1.404967	24170943		27.63166
2010	9.49E+09	1.48E+10	3.22E+10	7.37E+10	3.17E+10	1.429983	24779614	0	32.93092
2011	1.45E+10	1.94E+10	3.93E+10	8.58E+10	3.81E+10	1.520625	25387713	0	39.56567
2012	1.67E+10	2.18E+10	4.13E+10	9.83E+10	3.92E+10	1.824867	25996454	0	39.11031
2013	1.6E+10	2.22E+10	6.28E+10	1.41E+11	6.11E+10	1.98135	26607641	0	27.09407
2014	1.55E+10	1.95E+10	5.48E+10	1.52E+11	5.19E+10	2.896575	27224480	0	23.06943
2015	1.67E+10	2.11E+10	4.94E+10	1.45E+11	4.79E+10	3.714642	27849203	1.38	26.07639
2016	1.75E+10	2.06E+10	5.62E+10	1.42E+11	5.4E+10	3.909817	28481947	0.35	26.80908
2017	2.05E+10	2.22E+10	6.04E+10	1.49E+11	5.74E+10	4.350533	29121464	0.33	28.60447
2018	2.25E+10	2.32E+10	6.73E+10	1.62E+11	6.43E+10	4.585325	29767108	0.16	28.23191
2019	2.56E+10	2.69E+10	6.83E+10	1.76E+11	6.55E+10	5.217367	30417858	1.56	29.89275
2020	1.45E+10	1.25E+10	7E+10	1.79E+11	7.08E+10	5.595708	31072945	1.74	15.10055

COUNTRY 9: TURKEY

YEAR	Exports of goods and services (current US$)	Imports of goods and services (current US$)	GDP (current US$)	GDP, PPP (current international $)	GNI (current US$)	Official exchange rate (LCU per US$, period average)	Population, total	Insecurity	REAL OPENESS
1990	2.01E+10	2.65E+10	1.51E+11	4.6E+11	1.48E+11	0.002609	53921758		10.13536
1991	2.08E+10	2.5E+10	1.5E+11	4.8E+11	1.47E+11	0.004172	54840595		9.527776
1992	2.28E+10	2.75E+10	1.58E+11	5.2E+11	1.56E+11	0.006872	55748946		9.667921
1993	2.46E+10	3.49E+10	1.8E+11	5.75E+11	1.77E+11	0.010985	56653808		10.34106
1994	2.79E+10	2.66E+10	1.31E+11	5.55E+11	1.27E+11	0.029609	57564209		9.821585
1995	3.37E+10	4.13E+10	1.69E+11	6.08E+11	1.66E+11	0.045845	58486453		12.33439
1996	3.91E+10	5.05E+10	1.81E+11	6.61E+11	1.79E+11	0.081405	59423278		13.54574
1997	4.67E+10	5.77E+10	1.9E+11	7.22E+11	1.87E+11	0.151865	60372571		14.44729
1998	5.7E+10	5.44E+10	2.76E+11	5.58E+11	2.73E+11	0.260724	61329665		19.96869
1999	4.82E+10	4.83E+10	2.56E+11	5.47E+11	2.53E+11	0.418783	62287391		17.66915
2000	5.45E+10	6.16E+10	2.74E+11	6.09E+11	2.7E+11	0.625219	63240196		19.07914
2001	5.48E+10	4.58E+10	2.02E+11	5.96E+11	1.97E+11	1.225588	64192243		16.88985
2002	6.03E+10	5.5E+10	2.4E+11	6.12E+11	2.36E+11	1.507226	65145357		18.82274
2003	7.24E+10	7.3E+10	3.15E+11	6.41E+11	3.09E+11	1.500885	66089402		22.68433
2004	9.66E+10	1.03E+11	4.09E+11	7.36E+11	4.03E+11	1.425537	67010930		27.13329
2005	1.11E+11	1.23E+11	5.06E+11	8.15E+11	5.01E+11	1.343583	67903461		28.66173
2006	1.25E+11	1.47E+11	5.57E+11	9.45E+11	5.51E+11	1.428453	68756809		28.73562
2007	1.49E+11	1.77E+11	6.81E+11	1.04E+12	6.75E+11	1.302931	69581854		31.26551
2008	1.82E+11	2.08E+11	7.7E+11	1.14E+12	7.63E+11	1.301522	70418612		34.17629
2009	1.52E+11	1.52E+11	6.49E+11	1.11E+12	6.42E+11	1.54996	71321406		27.30638
2010	1.65E+11	1.98E+11	7.77E+11	1.27E+12	7.7E+11	1.502849	72326992	4.95	28.59551
2011	1.93E+11	2.54E+11	8.39E+11	1.45E+12	8.32E+11	1.674955	73443254	4.61	30.74699
2012	2.15E+11	2.51E+11	8.81E+11	1.55E+12	8.74E+11	1.796001	74651046	5.2	29.99989
2013	2.28E+11	2.75E+11	9.58E+11	1.7E+12	9.49E+11	1.903768	75925454	5.76	29.53023
2014	2.37E+11	2.68E+11	9.39E+11	1.86E+12	9.31E+11	2.188542	77229262	5.98	27.13507
2015	2.12E+11	2.3E+11	8.64E+11	2.02E+12	8.55E+11	2.720009	78529413	5.74	21.83382
2016	2.01E+11	2.2E+11	8.7E+11	2.12E+12	8.61E+11	3.020135	79827868	6.74	19.85954
2017	2.24E+11	2.55E+11	8.59E+11	2.26E+12	8.48E+11	3.648133	81116451	7.52	21.1545
2018	2.43E+11	2.44E+11	7.78E+11	2.3E+12	7.67E+11	4.82837	82340090	7.04	21.15129
2019	2.48E+11	2.28E+11	7.61E+11	2.24E+12	7.48E+11	5.673819	83429607	6.53	21.25675
2020	2.06E+11	2.34E+11	7.2E+11	2.3E+12	7.11E+11	7.008605	84339067	6.11	19.16338

COUNTRY 10: INDIA

YEAR	Real Bilateral Exchange Rate (LCU per US$, period average))	Export (of GDP US$)	Import(of GDP US$)	GDP (current US$)	Population	GNI = same as GNP(current US$)	INSECURITY (India Terrorism index, on a scale of 1-10)	GDP, PPP (current international $)	Real Openness
1990	17.5035	2.71E+10	2.26E+10	3.21E+11	8.73E+08	3.17E+11		1.05E+12	0.047482
1991	22.74243	2.29E+10	2.29E+10	2.7E+11	8.91E+08	2.66E+11		1.1E+12	0.041899
1992	25.91808	2.76E+10	2.55E+10	2.88E+11	9.09E+08	2.84E+11		1.18E+12	0.044965
1993	30.49329	2.74E+10	2.75E+10	2.79E+11	9.27E+08	2.75E+11		1.27E+12	0.043321
1994	31.37374	3.33E+10	3.24E+10	3.27E+11	9.46E+08	3.23E+11		1.38E+12	0.04761
1995	32.42708	4.33E+10	3.91E+10	3.6E+11	9.64E+08	3.56E+11		1.52E+12	0.05435
1996	35.43317	4.54E+10	4.08E+10	3.93E+11	9.82E+08	3.89E+11		1.66E+12	0.051899
1997	36.31329	4.96E+10	4.45E+10	4.16E+11	1E+09	4.12E+11		1.76E+12	0.053533
1998	41.25937	5.34E+10	4.64E+10	4.21E+11	1.02E+09	4.18E+11		1.89E+12	0.052923
1999	43.05543	6.13E+10	5.25E+10	4.59E+11	1.04E+09	4.55E+11		2.08E+12	0.054669
2000	44.94161	6.51E+10	6.09E+10	4.68E+11	1.06E+09	4.63E+11		2.21E+12	0.056971
2001	47.18641	6.52E+10	6.1E+10	4.85E+11	1.08E+09	4.81E+11		2.37E+12	0.053227
2002	48.61032	7.85E+10	7.35E+10	5.15E+11	1.09E+09	5.11E+11		2.5E+12	0.060801
2003	46.58328	9.51E+10	9.08E+10	6.08E+11	1.11E+09	6.03E+11		2.75E+12	0.067633
2004	45.31647	1.39E+11	1.27E+11	7.09E+11	1.13E+09	7.04E+11		3.05E+12	0.087308
2005	44.09998	1.84E+11	1.61E+11	8.2E+11	1.15E+09	8.14E+11		3.39E+12	0.101624
2006	45.30701	2.3E+11	2E+11	9.4E+11	1.17E+09	9.33E+11		3.78E+12	0.113827
2007	41.34853	3.03E+11	2.53E+11	1.22E+12	1.18E+09	1.21E+12		4.18E+12	0.133104
2008	43.50518	3.51E+11	2.89E+11	1.2E+12	1.2E+09	1.19E+12		4.39E+12	0.145821
2009	48.40527	3.47E+11	2.74E+11	1.34E+12	1.22E+09	1.33E+12		4.76E+12	0.130364
2010	45.72581	4.5E+11	3.75E+11	1.68E+12	1.23E+09	1.66E+12	7.77	5.23E+12	0.157809
2011	46.67047	5.67E+11	4.47E+11	1.82E+12	1.25E+09	1.81E+12	7.8	5.62E+12	0.180488
2012	53.43723	5.71E+11	4.48E+11	1.83E+12	1.27E+09	1.81E+12	8.15	6.15E+12	0.165721
2013	58.59785	5.28E+11	4.72E+11	1.86E+12	1.28E+09	1.83E+12	7.48	6.48E+12	0.154339
2014	61.02951	5.29E+11	4.68E+11	2.04E+12	1.3E+09	2.02E+12	7.86	6.78E+12	0.147114
2015	64.15194	4.65E+11	4.17E+11	2.1E+12	1.31E+09	2.08E+12	7.75	7.16E+12	0.123172
2016	67.19531	4.8E+11	4.4E+11	2.29E+12	1.32E+09	2.25E+12	7.48	7.74E+12	0.118916
2017	65.12157	5.82E+11	4.98E+11	2.65E+12	1.34E+09	2.62E+12	7.53	8.28E+12	0.130516
2018	68.38947	6.4E+11	5.39E+11	2.7E+12	1.35E+09	2.67E+12	7.57	9.02E+12	0.130679
2019	70.42034	6.02E+11	5.29E+11	2.83E+12	1.37E+09	2.8E+12	7.52	9.53E+12	0.118784
2020	74.09957	5.09E+11	4.99E+11	2.67E+12	1.38E+09	2.63E+12	7.35	9.01E+12	0.111995

DISTANCE (KM)

CHINA	SOUTHAFRICA	RUSSIA	USA	UK	NIGER	JAPAN	GHANA	TURKEY	INDIA
11,458	6 790	6258.4	12332	7183	796	13,476	410	4,604.04	7607