

The Determinants of Export Diversification at All Margins Case Study: South Korea^{*}

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Abstract — Export diversification is considered an effective remedy for avoiding the uncertainties in terms of international trade, achieving the stability in export earnings, and long run sustained economic growth. This study explores the macroeconomic and structural factors may affect export diversification. Thus, it tries to fill the gap in the literature through examining empirically the effect of these factors on both forms of export diversification: product diversification and geographical diversification by constructing the export diversification composite index which has been developed from the most common measurement of export diversification, Herfindahl-Hirschman index, in the case of South Korea during the period when Korea started to implement the diversification policy in its export sector, from (1970-2010) that's why the study applied Vector Error Correction model (VEC) in order to analyze the time series data of 41 years. The result reveals that Korean government has a pivotal role behind the successful implementation of export diversification strategy through its expenditure on exports, rational implementation of trade liberalization, and maintaining the stability in exchange rate as well as the export composition of technological products.

Keywords — Export Diversification, Economic Growth, Trade Cost, and Trade Liberalization.

1 INTRODUCTION

Export growth plays an important role in the economy due to its effect on trade growth and economic growth. Therefore, the sustainability of export growth rate is an eligible target for any country. The globalization phenomenon and openness to trade under uncertain circumstances, such as the collapse of Second World War in 1950 and global financial crisis in the late of 2008, may introduce uncertainties and fluctuations in the export earnings which discourage the investment opportunities. Discouraging investment opportunities leads to instability in export growth which reflects negatively to economic growth.

Most recent research has established that export diversification is the effective remedy for these uncertainties due to its pivotal role in avoiding the shortfalls in export concentration. For instance, an economy can avoid investment risks, highly increased volatility in the exchange rate, and extreme price and volume fluctuations by diversifying the number of exporting commodities and increasing the number of exporting sectors rather than depending on a limited number of commodities in the export basket (Herzer and Nowak-Lehmann 2006). Furthermore, shifting from primary commodities to manufacturing commodities introduces new production techniques which will benefit other sectors through the knowledge spillover such as management style improvement, productivity enhancement, capital

accumulation, and knowledge about the international market (Al-Marhubi 2000). In addition, the possibility of fostering the economic growth rate through diversification margins, whether by vertical margin through adding new products, and expanding them in new markets or horizontal margin through expanding the existing products in the existing markets. Moreover, diversify the exports geographically helps in avoiding the trade fluctuations (Bacchetta et al. 2007).

The important role of export diversification can be proved in the light of East Asian "Tigers" -- China, Japan, Singapore and South Korea, where the export diversification has been adopted over the last five decades with fruitful economic returns. With this mention, export expansion has been the main cause for export promotion in South Korea. Since the adoption of export-led growth strategy in 1962, export values increased from 32 thousand USD in 1960 to 466 million USD in 2010 (Korean Statistical Information Service (KOSIS) 2012). Thereafter, GDP increased from 81 USD in 1970 to 10,147 thousand million USD in 2010 (Bank of Korea (BOK) 2012). Most of research indicates that export diversification was the key success of that strategy since shifting from primary products to capital intensive products in 1962 and then from Heavy and Chemical industries (HCI) in 1973, to technology-based electronic products and high value added capital products in 1995. The diversification strategy helped Korean economy in decreasing external shocks, exposure of trade deterioration and enhancing the export performance and

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overall the economic growth.

On the other side, Central American countries, specifically Costa Rica, El-Salvador, Guatemala, and Honduras, applied different diversification programs such as, nontraditional farm-raised shrimp, textile and cut flowers in the early of 1970s and the middle of 1990s; however, they could not attain the stability in their export earnings (Stanley and Bunnag 2001). Thereby, increased levels of export diversification could not alone guarantee higher levels of economic growth (Bebczuk and Berrettoni 2006). It would seem, therefore, that further investigations are needed in order to guarantee the successful implementation of export diversification policy. Although the previous literature provided us with intensive debate on export diversification strategy and its tangible impact on economic growth, the determinants of export diversification, which are important for understanding the differences among the countries, have not explored abundantly. Even with few studies that explored recently these determinants, they have concentrated on export product diversification at different margins without paying a considerable attention to export geographical diversification which is an important remedy for mitigating the negative impacts of any crisis might be imported from other countries.

In that regard, this study aims to fill the gap in the literature by exploring the macroeconomic and structural factors may affect export diversification at both forms: product and geographical diversification in South Korea since the period when the implementation of diversification policy in its export sector, from 1970 to 2010 by constructing export diversification composite index and using the Vector Error Correction (VEC) model to analyze the time series data. Thereby, the next section describes the data and discusses the methodology the main econometrics challenges. The third section explains the results and discussion while the last section provides the conclusions.

2 DATA AND METHODOLOGY

2.1 Data: Export items data classified by Standard International Trade Classification (SITC ver. 3) at 2- digit level according to Harmonized Commodity Description and Coding System (HS/K). Due to the data availability limitation, the data were collected from two data sources: Korean Statistical Information Service (KOSIS) covers the period from 1977 to 2010, and World Trade Flows dataset, compiled by Feenstra et al. (1997), covers the period from 1970 to 1976. The later contains information of bilateral trade at the 4-digit (SITC rev. 2) level. Thereafter, the data related to exports in this dataset were collected using Microsoft Visual Studio.Net application and aggregated by summing up the products at 2- digit level across importers. While Export data distributed by nations counted as 253 states and areas according to International Organization for Standardization (ISO) (see Appendix table 1). The data

were collected from KOSIS. These two datasets of exports have been used in building the export diversification composite index.

The factors affecting export diversification are divided into two groups: Macroeconomic factors which mainly affect the export product diversification and structural factors which mainly affect the export geographical diversification. Herein, The Macroeconomic factors consist of four variables. The first two variables are Korean government expenditure on export of goods and services (GEXD) and the gross capital Formation (GCF), as a proxy of technological level, both valued in billions of Korean won. The third variable is macroeconomic stability which is constructed as a composite index (ECOSTAB) developed from two major indicators of price fluctuations (annual inflation rate calculated from consumer price index and GDP deflator). This composite index provides a multidimensional indicator of price changes and avoids the shortcomings in each variable individually. The last variable is exchange rate volatility (EXVOL) was computed as standard deviation of monthly changes in nominal exchange rate over the entire four years involved in each observation. Straightaway, Exchange rate data were collected for each month over all the study time period (1970- 2010) for 492 observations. The exchange rate volatility formula can be written as follow (Najafov 2010):

$$V = \sqrt{\frac{1}{n-1} \sum (E_t - \bar{E})^2} \quad (1)$$

Where V is the volatile value of exchange rate for each four years, E is the value of monthly exchange rate in month t, \bar{E} is the arithmetic mean of exchange rate for each four years, and n is number of monthly exchange rate values over four years. The macroeconomic factors data was collected from BOK except annual inflation rate were collected from WB.

On the other side, the structure factors consist of three main variables. Geographical distance measured by Remoteness index (REMI), as a proxy of trade costs, was computed as the inverse of log GDP divided by the average log distances in kilometers from Korea to its major trading partners which can be expressed by this formula (Rose 2004):

$$\text{Remit} = \frac{1}{\log(\text{GDPT}) / \log \bar{Y}} \quad (2)$$

Where \bar{Y} is the average of kilometers.

Trade openness (TRDOP), as a proxy of trade liberalization, was computed as the ratio of sum of exports (XP) and imports (IM) to GDP (Agosin, Alvarez, and Bravo-Ortega 2012).

$$\text{TRDOP}_t = \frac{X_{Pt} + I_{Mt}}{\text{GDPT}} \quad (3)$$

The third variable is the country's size measured by the number of population (POP) rather than GDP in order to reflect the factor endowment and avoid any exogenous resources. The structure factors data was collected from KOSIS.

2.2 Methodology and Analysis: In order to investigate the Korean export composition and provide a comprehensive analysis for export diversification process in South Korea, both product and geographical diversification have been considered by developing a composite index of these two forms. First, we measured export concentration for each form, export product concentration (PHHI) and export geographical concentration (GHHI), using Herfindahl-Hirschman index, the most commonly statistical measurement of export concentration which is calculated by taking sum squared of export share for a certain product or country to total exports as following (Meilak 2008):

$$PHHIt = \sum_{i=1}^n \left(\frac{X_{it}}{X_t} \right)^2 \quad (4)$$

Where X_{it} is the value of export for category i in year t , X_t is the value of total exports in year t , and n the number of categories.

$$GHHIt = \sum_{i=1}^n \left(\frac{X_{it}}{X_t} \right)^2 \quad (5)$$

Where X_{it} is the value of export for country i in year t , X_t is the value of total exports in year t , and n the number of countries.

The value of the concentration index ranges from one, indicates perfect case of concentration, and zero, indicates perfect case of diversification. In order to avoid the double counting, redundancy, and collinearity between these two indices, statistical correlation has been tested (OECD 2008)¹. The result shows low degree of correlation between them (see Appendix table 4). Second, we established the composite index (CHHI) from these two indices and gave them an equal weight (OECD 2008). Then we calculate the diversification index (DIVI) by subtracting one from this composite index as $DIVI = 1 - CHHI$ (Agosin 2009) (see Appendix table 2).

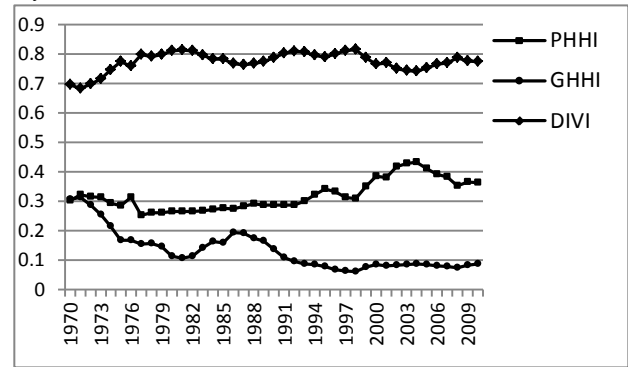


Figure 1 shows the Hir-schmann-Herfindahl indices for product and geographical concentration and the composite index of all forms of export diversification. As can be seen the downward trend of geographical concentration (GHHI) confirms its decreasing while the Product concentration (PHHI) shaping up and down line over the period. On the other hand the diversification composite index (DIVI) has upward trend which confirms its increasing over the period.

In order to explore the determinants of export diversification, the export diversification composite index has been regressed on the macroeconomic and structural factors within the use of multiple regression model with least square method. Prior to run regression, a number of econometric testes should be examined related to the natural of time series data in order to choose the appropriate estimation model using the Eviews econometrics software version 7.0.

¹ The same method has been applied for the Macroeconomic stability composite index and the correlation result confirmed no existence of collinearity between annual inflation rate (INF) and GDP deflator (GDPD) (see appendix table 4).

2.2.1 Stationary: examination the property of stationary in time series data is very important before estimating the regression model, otherwise the result will show significant regression results from unrelated data which will be spurious regression (Hill et al. 2012). In this regard Augmented Dickey Fuller (ADF) test developed by Dickey and Fuller (1979) has been used to examine the stationary property. The results in table 1 show that all the variables are nonstationary I(0) except LGXD, ECOSTAB, REMI, and LTRDOP. Moreover, it shows that all variables became stationary I(1).

2.2.2 Cointegration Test: Hill, Griffiths, and Lim (2012)

TABLE 1
 AUGMENTED DICKEY-FULLER TEST RESULT

Variables	Augmented Dickey-Fuller test statistic	
	Level	First Difference
DIVI	-3.335082	-3.352240
LGEXD	-4.874823*	-4.210383*
LGCF	-0.996362	-6.161021*
LEXVOL	-3.391988	-4.207546*
ECOSTAB	-4.064595*	-5.952749*
REMI	-4.301727*	-1.316566*
LTRDOP	-4.754775*	-4.222285*
LPOP	-1.190819	-2.728270

Note: The critical value at 90%, 95%, and 99% significant level is -3.196411, -3.529758, and -4.211868 respectively.

*denotes rejection of the hypothesis at 95% significant level.

stated that macroeconomic time series are nonstationary and cannot be used in the linear regression model, unless they are I(1) (or at least one of them) and cointegrated. Granger and Engle (1987) suggest estimating the cointegration relations using the regression method as cointegration implies that the dependent variable and the independent variables share similar trends. Furthermore, the combination of cointegrating equation may interpret a long-run equilibrium relationship among the variables without requiring the data to be stationary. Johansen (1988) developed the method of likelihood-based inference for testing the problems in the context of cointegration. This method has been applied and the results are shown in table 2. which confirmed rejecting the null hypothesis of no cointegration among the variables. Hence, there is cointegration between at most seven variables among the eight variables.

2.2.3 Estimation Procedures: Since the cointegration relation among the variables has been proved, the regression models can be estimated without spurious results. The existence of cointegration among the variables, as above mentioned, commits the basic condition of

TABLE 2
 JOHANSEN COINTEGRATION TEST RESULT

Unrestricted Cointegration Rank Test (Trace)			
Lags interval (First differences): 1 to 1			
Rank of No of CE(s)	Trace Statistic	0.05 Critical Value	Prob.**
0*	256.4523	159.5297	0.0000
1*	182.4654	125.6154	0.0000
2*	133.1874	95.75366	0.0000
3*	89.79807	69.81889	0.0006
4*	53.64552	47.85613	0.0130
5	32.29967	29.79707	0.0522
6	13.53943	15.49471	0.0965
7*	4.263367	3.841466	0.0389

* denotes rejection of the hypothesis at the 0.05 level

**Mackinnon-Haug-Michelis (1999) p-value

implementing the Vector Error Correction (VEC) model (Toda and Yamamoto 1995). Using the VEC model helps to explore the short run and the long-run equilibrium relationship as well as the causality between the dependent variable and the independent variables. Moreover, VEC model not only examines how much the dependent variable will change in response to the independent variables, but also examines the speed of this change (Hill, Griffiths, and Lim 2012). Vector Error Correction model can be expressed by the following equation:

$$\Delta y_t = \alpha_1 + \alpha_2 (y_t - 1 - \beta_0 - \beta_1 x_t - 1) + vt^y \tag{5}$$

Where Δ represents the first difference, α is the cointegrated vector, α_1 is the constant representing a liner trend, and α_2 is the correction coefficient which shows how much the change in dependent variable (y_t) and independent variable (x_t) responses to the cointegrating error (vt).

2.2.4 Residuals Test: The Residual value e is considered to be an explanatory variable other than the variables included in the model, therefore the dependent variable has been affected by variance of e ; thereby, a number of conditions should be tested related to it.

Checking for autocorrelation between the residuals, the results show that the residuals are not serially correlated since the value of Durbin-Waston (DW) statistics (2.33) is greater than 1.3.

For the checking of heteroscedasticity between e and the dependent variable, the variance of each residual e should be examined in order to assure the regression model is appropriate to explain the correlation among the variables. The small variance of e means heterokedasticity does not exit and the dependent variable does not deviate from its mean which indicates that the dependent variable and e are

homoscedastic; moreover, the independent variables are appropriate to explain the change in the dependent variable. The Breusch-Pagan Heteroskedasticity test has been utilized and its results confirmed that the variables are homoscedastic (see Appendix table 5).

3 RESULTS AND DISCUSSION

3.1 Results: Export diversification composite index (DIVI) has been regressed on the macroeconomic and structural factors in order to explore comprehensively the determinants of export product and geographical diversification in South Korea. The result is shown in Table3.

As can be seen from the table, the positive sign of the error correction term (ECT)² from VCE model confirms the change in export diversification composite index rises by

TABLE 3
ESTIMATED MULTIPLE LINEAR REGRESSION RESULT

Dependent Variable: $\Delta(DIVI)$

Variables	Coefficient	T-Statistic	Prob.
$\Delta(DIVI)$	-0.485903 (0.212216)	-2.289669	0.0330**
$\Delta(LGEXD)$	0.150362 (0.045492)	3.305278	0.0035***
$\Delta(LGCF)$	0.052745 (0.023369)	2.257067	0.0353**
$\Delta(LEXVOL)$	-0.023502 (0.005395)	-4.356163	0.0003***
$\Delta(ECOSTAB)$	-0.061415 (0.021945)	-2.798672	0.0111**
$\Delta(REMI)$	-21.50655 (11.15596)	-1.927808	0.0682
$\Delta(LTRDOP)$	-0.034631 (0.034787)	-0.995507	0.3314
$\Delta(LPOP)$	3.3611465 (1.487704)	2.427543	0.0248**
ECT	0.106676 (0.022770)	.684970	0.0001***
R-Squared	8.031332	AdjR-Squared	0.763628
F-Statistic	0.872231	Prob.(F-Statistic)	0.000014
Durbin-Waston Stat	2.334056		

Symbols *, **, *** represent the significant levels
10%,5%,1% respectively

meaning that export diversification increases over the time period. Moreover, having value less than one ensures that the model is stable and not explosive. The highly significant of this coefficient (at level 1%) indicates long run causality relationship between the explanatory variables and export diversification composite index. In addition, it indicates that 10% of disequilibrium will be corrected within one

year. The examination of the R-squared, adjusted R-squared, and F-Statistics suggest that all variables in VEC model significantly explain the short run changes in DIVI except trade liberalization expressed by trade openness (LTRDOP).

In more explanation, the result suggests a highly significant (at level 1%) positive linear relationship between export diversification and government expenditure on export of goods and services (LGEXD), and between export diversification and the technological level expressed by gross capital formation (LGCF). Similarity, it shows significant (at level 5%) positive linear relationship between export diversification and country size expressed by number of population (LPOP). On the other hand, it suggests a highly significant (at level 1%) negative linear relationship between export diversification and exchange rate volatility (LEXVOL), and also between export diversification and trade cost, expressed by remoteness index (REMI). Furthermore, it suggests significant (at level 5%) negative linear relationship macroeconomic stability, expressed by macroeconomic stability composite index (ECOSTAB). In addition, it shows insignificant negative linear relationship between export diversification and trade liberalization expressed by trade openness (LTRDOP).

Overall, the result suggests that all the macroeconomic and structural factors have a highly significant long run and short run linear relation with the export product and geographical diversification except trade liberalization in the case of South Korea.

3.2 Discussion: In last five decades, export diversification strategy aroused a great debate on its tangible effect on economic growth among the economic policy planners in general and trade policy makers in particular. Notwithstanding it has been adopted by different countries around the world, its effective returns on export and economic growth has been achieved by few number of countries such as South Korea. Therefore, this study aimed to investigate the reasons behind the successful implementation of export diversification strategy in South Korea by exploring the determinants of export diversification process. With a view to provide a comprehensive investigation, the study first developed a composite index of two major forms of export diversification: product and geographical diversification. Second, the study explored the major macroeconomic and structural factors affecting export diversification at these both forms according to the previous literature and in the light of policies and actions that Korean government has implemented in order to support this strategy.

The result presents a positive relation between export diversification and government expenditure on export of goods and services which can be generated from the pivotal role that Korean government played in promoting export

² Hill and Griffiths (2012) stated that the correction of error term happens according to the condition of stability put on ECT in which $-1 < ECT \leq 0$ and $0 \leq ECT < 1$. Thereby, ECT may have negative or positive sign. A positive ECT ensures that Δy rises while a negative ECT ensures that Δy falls. Moreover, it puts that ECT must be more than 1 in absolute value to ensure that VEC model is not explosive.

diversification policy since the adoption of export-led growth strategy in the beginning of 1960s. This role embodied in the financial and fiscal incentives which have been provided to the exporters along with establishment of main trade institutions such as KOTRA and KITA to overcome the trade barriers and facilitate the export movements. However, it must be noted that the policy did not limit itself to incentive diversification measures but also to disincentive measures such as abolishment of the preferential interest rates and reduction of various tax due to high inflation rate and structural imbalance resulted from massive incentives to HCI, as well as the government treated all the industries equally and paid more attention to R&D and manpower activities. In addition, and simultaneously, the government adopted certain policies to facilitate the export promotion such as exchange rate depreciation, real effective exchange rate stabilization, and trade liberalization with import protection to guarantee the stable availability of intermediate goods and capital goods needed for industrialization.

Therefore, the positive relationship between export diversification and gross capital formation can be explained through the link between export diversification and the technological level. This link generated since the shifting from primary products to manufacturing products which reduces the dependence on primary products, and expands manufacturing activities. The expanding of manufacturing activities increases the technological knowledge and learning which enable the economy to apply foreign technologies. The adoption of new technologies enhances the abilities to innovate new products in order to achieve the international competitiveness and, simultaneously, it increases the diversification levels (Herzer and Nowak-Lehmann 2006; Agosin 2009; Shepherd 2010). Similarity, the positive relation between export diversification and country size refers to that, large size of country in terms of number of population provides the economy with various skills able to apply the technological knowledge which latter encourages the opportunities of diversification by introducing new products (Dutt, Mihov, and Zandt 2011).

On the other hand, the result shows that exchange rate volatility, trade liberalization, macroeconomic stability, and trade costs induce more export concentration rather than diversification. According to Meltiz (2003) exchange rate volatility associated with the trade costs, namely entry costs. Thereby, the uncertainty in the exchange rate value affects negatively the decision of firms to enter the international markets if they expect the profits will be lower than the entry cost. Therefore, the introduction of unified floating exchange rate system in 1965 along with the stabilization in real exchange rate until 1990s in Korea had a great impact to supreme the diversity in exports.

Although Meltiz (2003) argued that trade liberalization leads to improve export opportunities and increases the number of exporters to introduce various commodities, the result agrees with Agosin, Alvarez, and Bravo-Ortega

(2012) on emphasizing that trade liberalization lead the exporters to specialize in products in which they have a comparative advantage. Therefore, it modifies the production pattern toward trade specialization (Chen and Chang 2006); however, the result shows insignificant negative relation with export diversification in case of Korea. As the trade policy in Korea was characterized by outward export and quantitative restrictions on imports in order to maintain the availability of capital and intermediate goods for the industrialization needs until the 1980s and the full opening of entire market occurred in 1990s after Korea had a comparative advantage in IT industries.

Equally to most of researchers' findings, the larger the distance among the countries the more the trade costs which mainly are transportation costs. Thus, the geographical distance induces more geographical concentration rather than diversification (Osakwe 2007; Dutt, Mihov, and Zandt 2011; Agosin, Alvarez, and Bravo-Ortega 2012). Similarity, macroeconomic instability in terms of price fluctuations increases production costs, decrease investment, and leads to overvaluation of exchange rate in real terms which latter decreases export profits and increases trade costs Therefore, it has a negative effect on export diversification (Meltiz 2003; Al-Kawaz 2008).

4 CONCLUSION

In conclusion, the study shed the light on the role of government in promoting the export diversification policy in any economy through its expenditure on exports, rational implementation of trade liberalization, and maintaining the stability in exchange rate as well as the export composition of technological products. In addition, the study proposes that export diversification is the base for a stable export growth which achieves a sustained economic growth. Moreover, the study recommends the future research which will specialize in exploring the factors affecting export diversification process in Korea to measure the impact of other important factors such as human capital accumulation, and macroeconomic stability with consideration of the international competitiveness, as well as tariff rates, institutional development, and trade facilitations. In addition, further validation of export diversification composite index (DIVI) can be tested by disaggregating export product diversification into light manufacturing and heavy and chemical manufacturing commodities; and export geographical diversification into US destination and other Korea's main trading partners.

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REFERENCES

- [1] Agosin, Manuel R. "Export Diversification and Growth in Emerging Economies." *Cepal Review*, 2009, 97(4):115-131.
- [2] Agosin, Manuel R., Roberto Alvarez, and Claudio Bravo-Ortega. "Determinants of Export Diversification Around the World: 1962–2000." *The World Economy*, 2012, 35(3): 295-315.
- [3] Ahn, Dukgeun. "Korean in the Gatt/WTO Dispute Settlement System: Legal Battle for Economic Development." *Journal of International Economic Law*, 2003, 6(3): 597-633.
- [4] Al-Kawaz, Ahmed. "Economic Diversification: The Case of Kuwait Reference to Oil Producing Countries." *Journal of Economic Cooperation*, 2008, 29 (3): 23-48.
- [5] Al-Marhubi, Fahim. Export Diversification and Growth: An Empirical Investigation." *Applied Economics letters*", 2000, 7:559-562.
- [6] Bebczuk, Ricardo N., Daniel Berrettoni. "Explaining Export Diversification: An Empirical Analysis." Department of Economics, Universidad Nacional de La Plata, 2006, Working Paper 065
- [7] Chen, Hung-Yi and Yang-Ming Chang. "Trade Verticality and Structural Change in Industries: The Cases of Taiwan and South Korea." *Open economies review*, 2006, 17:321-340.
- [8] Dickey, A David., and Wayne Fuller. "Distribution of the Estimators for Autoregressive Time Series with a Unit Root." *Journal of the American Statistical Association*, 1979, 74 (June): 427-431.
- [9] Dutt, Pushan, Ilian Mihov, and Timothy Van Zandt. "Does WTO Matter for the Extensive and the Intensive Margins of Trade?" *Journal of Public Economic Theory*, 2011, 65(2):1-30.
- [10] Engle, Robert F., and Clive William John Granger. "Co-Integration and Error Correction: Representation, Estimation, and Testing." *Econometrica*, 1987, 55 (March): 251-276.
- [11] Feenstra, Robert C., Robert Lipsey, and Harry Bowen. "World Trade Flows, 1970-1992, With Production and Tariff Data." National Bureau of Economic Research NBER, 1997, Working Paper 5910.
- [12] Herzer, Dierk, and Felicitas Nowak-Lehmann Danzinger. "What does Export Diversification do for Growth? An Econometric Analysis." *Applied Economics*, 2006, 38(15):1825–1838.
- [13] Hill, R. Carter, William E. Griffiths, and Guay C. Lim. *Principles of Econometrics, International Student Version, Fourth Edition*. eds. R. Carter Hill, William E. Griffiths, and Guay C. Lim. Singapore: John Wiley & Sons (Asia) Pte Ltd, 2012.
- [14] Johansen, Soren. "Statistical Analysis of Cointegration Vectors." *Journal of Economic Dynamics and Control*, 1988, 12 (January): 231-254.
- [15] Meilak, Chris. "Measuring Export Concentration: The Implications for Small States." *Bank of Valletta Review*, 2008, 37(Spring):35-48.
- [16] Melitz, M. , "The Impact of Trade on Intra-Industry Reallocations and Aggregate Industry Productivity." *Econometrica*, 2003, 71(6): 1695–725.
- [17] Osakwe, Patrick N. "Foreign Aid, Resources and Export Diversification in Africa: A New Test of Existing Theories.", 2007, University Library of Munich MPRA Working Paper 2228.
- [18] Rose, Andrew K. "Do We Really Know that the WTO Increases Trade?" *American Economic Review*, 2004, 94 (March): 98-114.
- [19] Shepherd, Ben. "Geographical Diversification of Developing Country Exports." *World Development*, 2010, 38(9): 1217–1228.
- [20] Stanley, Denise L. and Sirima Bunnag. "A new Look at Benefits of Diversification: lessons from Central America." *Applied Economics*, 2001, 33(11):1369-1383.
- [21] Toda, Hiro Y., and Taku Yamamoto. "Statistical Inference in Vector Autoregressions with Possibly Integrated Processes." *Econometrics*, 1995, 66 (1-2): 225-250.