DYNAMICS OF EXPORTS AND ECONOMIC GROWTH AT REGIONAL LEVEL: A STUDY ON PAKISTAN'S EXPORTS TO SAAR[*]

SHAFAQAT MEHMOOD[†]
PIPFA

DAVID CARTER
The University of Chicago Booth School of Business, United States

ABSTRACT
The essence of sustainable development stresses the co-development of social, environment and economics. It is well recognized in literature that countries having a better export performance also enjoying the better economic growth and vice versa. Above said statement raises a striking question; is the economic growth (GDP) and exports having strong linkages? The aim of present study is to test the above said question at regional level exports, especially in context of Pakistan's exports to South Asian Association for Regional Cooperation (SAARC) to gauge the effectiveness of regional trade agreement. Study contributes literature in terms of regional level exports to test "economic growth and exports" relationship. Results revealed that Johansen cointegration test failed to affirm long run relationship between GDP and Pakistan's exports to SAARC, hence, short-term relationship exist. Granger causality revealed unidirectional nature of causality from GDP to Pakistan's exports to SAARC. The regulatory authorizes of developing nations should focus on the measures to improve their economic growth to gain the benefits from Regional Trade Agreements (RTAs).

Keyword: Exports; Economic Growth; Pakistan; SAARC.

INTRODUCTION
There are many critical social and environmental challenges. It has been commonly discussed amongst economists that International trade is considered as a major indicator for economic growth and export sector is an integral part of international trade (Ali & Talukder, 2009). "International trade improves productivity by enhancing market size and enjoying economies of scale" (Smith, 1776) and it is considered as a main tool for the growth of a country (Ricardo, 1817). An amazing growth in agreements of economic integration since 1950 is a notable event (Baier, Bergstrand, & Egger, 2007). There are approximately 511 Regional Trade Agreements (RTAs) which were either planned, in force or in negotiations in 2012 (WTO, 2012). RTAs have positive and significant impact on intra-regional trade and bilateral trade (Baier, Bergstrand, & Egger, 2007). The aim of this study is to explore the

---

[*] The views or opinions expressed in this manuscript are those of the author(s) and do not necessarily reflect the position, views or opinions of the editor(s), the editorial board or the publisher.
[†] Corresponding author Email: shafaqatphd@gmail.com

causal relationship between Pakistan's exports to SAARC and GDP of Pakistan as a measure of Pakistan economic growth.

The formation of RTAs is based on Article XXIV of General Agreement on Tariff and Trade (GAAT) which allows for the formation of RTAs or Customs Union (CU) by adopting some responsibilities (Espersen, 2011), and SAARC is an example of regional economic integration which was established in 1985 based on RTAs. The idea about formation of regional cooperation namely SAARC was first developed in 1977 by president of Bangladesh. SAARC was formed by seven economies namely; Pakistan, Sri Lanka, India, Bangladesh, Maldives, Nepal and Bhutan. Afghanistan became a part of regional organization later on in 2007 (SAARC, 2011).

Pakistan is second major country within SAARC after India. During the period of 1988-2010, Pakistan's total exports raised from 4,475.3 to 19,291 million dollar having an average growth rate of eight percent per year (SBP, 2010); Pakistan's exports to SAARC raised from 3,738 to 51,12 million Rupees having an average growth of 17,125 (Million rupee) per year (Pakistan, 2010).

Problem Statement

In selected empirical review of literature no clue was found related to the dynamics of GDP of Pakistan and Pakistan's exports to SAARC. In a few last years, Pakistan's relations with western countries were affected based on various elements, most recently North Atlantic Treaty Organization (NATO) attacked on Pakistan (Downnews, 2011). So, according to policy making point of view, there is a need to explore the dynamics of Pakistan's economic growth and Pakistan's exports to SAARC.

Significance of Study

Pakistan is geographically close to the remaining SAARC member countries and various elements like their way of life, language and fashion are also approximately similar. This study will be useful for the export oriented business of Pakistan, SAARC countries to be connected simply with each other, and the social development will also improve among Pakistan and SAARC countries. This study will also lead towards understanding the relationship between Pakistan's economic growth and Pakistan's exports to SAARC and the enhancement of exports to SAARC member countries. Finally present study will lead Pakistan's economy towards development, prove helpful for suitable policy prescriptions to enhance Pakistan's exports to SAARC and to improve balance of payment of Pakistan.

Research Objectives

The major objectives of present study are as follow:
- To explore relationship between GDP of Pakistan and Pakistan's exports to SAARC.
- To determine the nature of causality between Pakistan's economic growth and Pakistan's exports to SAARC

DATA AND METHODOLOGY

Measurement of Variables

This study includes five variables namely: Pakistan's Economic Growth, Pakistan's Total Exports (PTE), Pakistan's Total Imports (PTI), Pakistan's Exports to SAARC (PETS) and Pakistan's Imports from SAARC (PIFS). Pakistan's Economic Growth refers to nominal GDP of Pakistan and it is measured by taking natural logarithm of GDP nominal in million Rupees at constant factor cost of 1999-2000. PTE refers to Pakistan's export of goods and services. PTE measured by taking natural logarithm of value of PTE in million Rupees. PTI

refers to Pakistan's import of goods and services. PTI is measured by taking natural logarithm of value of PTI in million Rupees. PETS measured by taking natural logarithm of value of Pakistan's exports to SAARC in million Rupees. PIFS have been measured by taking natural logarithm of value of Pakistan's imports from SAARC in million Rupees.

Empirical Justification on Selection of Variables

The exclusion of variable namely Imports may lead to misrepresentation of results about the causality between exports and economic growth (Riezman, Whiteman, & Summers, 1996). The inclusion of variable namely Imports in a study can control misleading of results (Shan & Tian, 1998). Variable namely "Pakistan's Total Imports" was also used by the empirical studies of Serletis (1992), Islam (1998), Shirazi & Manap (2004), Ullah et al. (2009) and Alam (2011). Variable namely "Pakistan's Total Exprots" was included in the empirical studies of Shirazi & Manap (2004), Ullah et al. (2009), Safdari, Mahmoodi, & Mahmoodi (2011) and Alam (2011).

Comparative Advantage theory provided foundation for the formation of RTAs in mid of last century (Ruffin, 2002). According to the theory of CU or theory of RTAs, the formation of regional organization can improve nation's welfare (Siddique, 2007). Thus, the inclusion of Variable namely; PETS and PIFS in present study is valuable to explore the export-led growth or linkage of economic growth and exports at regional level.

In empirical literature, sub-sector level exports or a minor part of total exports were also included in various studies. So, this we used variable namely "Pakistan's Exports to SAARC), as Alege (1993) explored causal link between economin growth and totla exports, in presence of variable namely "oil exports". The empirical study of Khan, Hasan, & Malik (1995) also checked causal link between exports and grwoth, in presence of variables namely; real manufacturing exports and real primary exports as additional variables in their model.

Collection of Data

Annual time series data of under consideration variables for the period of 1975-2009 have been collected from International Monetary Fund (IMF) website, State Bank of Pakistan (SBP) Yearbook 2010 and Pakistan Economy Survey (various issues).

Hypotheses

The main hypotheses of on hand study are as under:

> *Hypothesis H1: There is a significance relationship between PETS and GDP of Pakistan.*
> *Hypothesis 2. PETS does granger cause GDP of Pakistan.*
> *Hypothesis 3. GDP of Pakistan does granger cause PETS.*
> *Hypothesis 4. PTE does granger cause GDP of Pakistan.*
> *Hypothesis 5. GDP of Pakistan does granger cause PTE.*
> *Hypothesis 6. PIFS does granger cause PETS.*
> *Hypothesis 7. PETS does granger cause PIFS.*
> *Hypothesis 8. PTE does granger cause PETS.*
> *Hypothesis 9. PETS does granger cause PTE.*
> *Hypothesis 10. PTI does granger cause PETS.*
> *Hypothesis 11. PETS does granger cause PTI.*

Statistical Techniques

Unit root in series has been investigated via implying Augmented Dickey Fuller (ADF) test, this test has been used to find unit root in the time series data of variable under consideration. This test is able to control the problem of autocorrelation by adding the lag

terms as dependent variables. Cointegration between pairs of variables has been explored by employing OLS method on the linear combinations of variables. The existence of the long run link between the variables has been explored by Johansen co-interrogation test. Mostly, time series data are non-stationary at level but series achieves stationary condition at first difference. In cointegration test, Cointegration Regression and Stationarity of Residuals are two main methods to identify the long run relationship among variables. The existence of long run relationship between pair of variables depends on the stationarity of residuals at level. Finally, direction of causality among variables has been identified by employing the Granger causality test.

RESULTS AND DISCUSSIONS
Where; GDP = Log (Gross Domestic Product), PETS = Log (Pakistan's exports to SAARC), PIFS = Log (Pakistan' imports from SAARC) and PTE = Log (Pakistan's total exports) and PTI = Log (Pakistan's total imports).

Unit Root Investigation
Table 1 indicate that critical values at 1%, 5% and 10% are less than calculated values of ADF and values of probability are also greater than 0.05. Thus, study failed to reject null hypothesis of this test and concluded presence of unit root in series under consideration. It means that time series variables are not stationary at level.

TABLE 1
Augmented Dickey-Fuller (ADF) Test at Level

Variables	ADF values	Critical Values			Prob.	DW test	R Square
		1%	2%	3%			
GDP	-0.655	-3.638	-2.952	-2.615	0.845	1.567	0.014
PETS	0.132	-3.640	-2.953	-2.613	0.964	2.165	0
PIFS	0.771	-3.640	-2.952	-2.615	0.993	2.201	0.019
PTE	-1.325	-3.644	-2.953	-2.616	0.605	2.082	0.108
PTI	0.012	-3.638	-2.952	-2.615	0.954	1.961	0

Note. "DW test" and "Prob." indicate the Durbin-Watson statistic and Probability respectively.

Figure 1 contains line graphs, which show the behavior of variables namely; PTE, PETS, GDP, PIFS, and PTI at level. The behavior of variables shows non-stationarity of variables at level with upward.

FIGURE 1
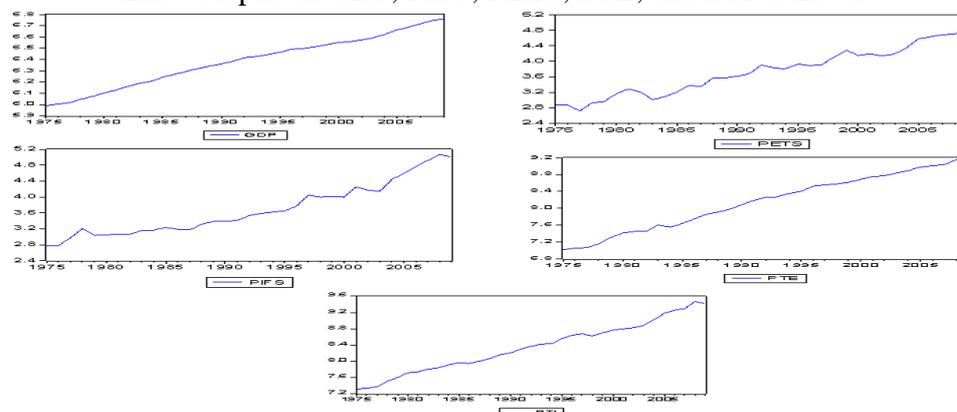Line Graphs of GDP, PIFS, PETS, PTE, and PTI at Level

Table 2 shows results of ADF test, which indicate critical values at 1%, 5% and 10% are greater than calculated ADF values, and P values are significant having values less than 0.05. Thus, study rejects null hypothesis of this test and concludes absence of unit root in series under consideration. It means that time series variables are stationary at first difference.
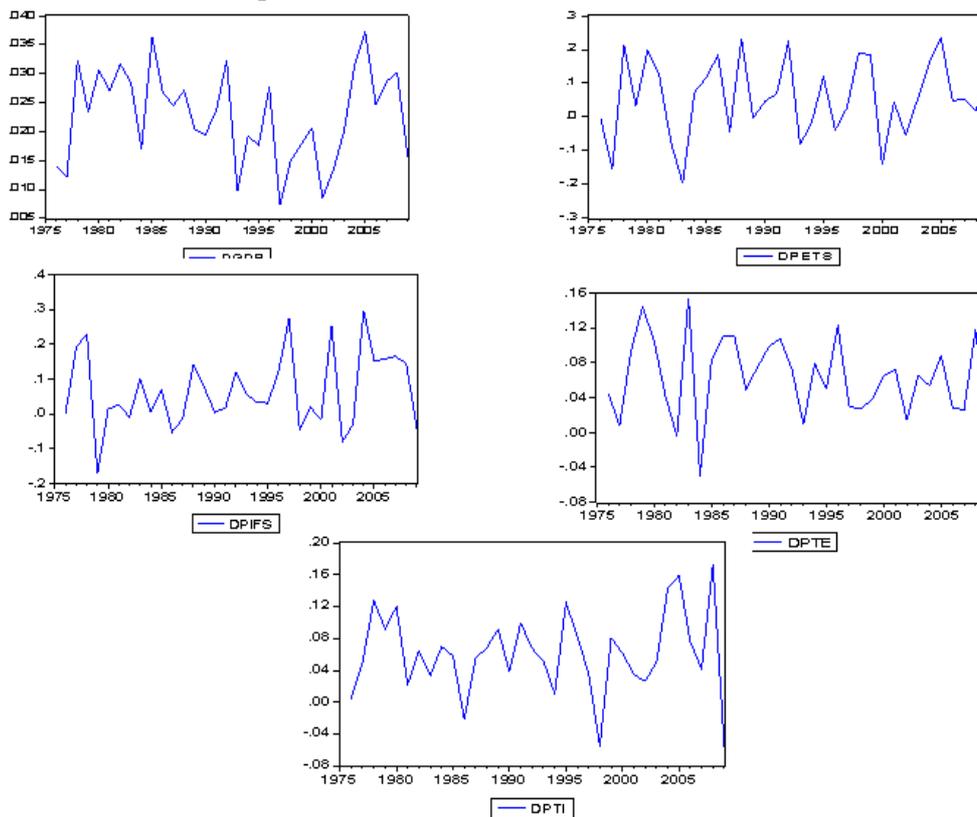
TABLE 2
ADF Test at 1st Difference

Variables	ADF values	Critical Values			Prob.	D.W. test	R Square
		1%	2%	3%			
GDP	-4.592	-3.645	-2.953	-2.616	0	2.043	0.405
PETS	-6.081	-3.645	-2.955	-2.614	0	1.966	0.544
PIFS	-5.964	-3.644	-2.955	-2.616	0	1.933	0.535
PTE	-6.974	-3.645	-2.953	-2.614	0	2.019	0.611
PTI	-5.696	-3.647	-2.955	-2.616	0	1.898	0.512

Note. "DW test" and "Prob." indicate the Durbin-Watson statistic and Probability respectively.

Figure 2 contains line graphs, which show the behavior of variables namely; PTE, PETS, GDP, PIFS, and PTI at first difference. The behavior of variables indicates stationarity of variables at first difference because series does not have problem of non-stationarit

FIGURE 2
Line Graphs of GDP, PIFS, PETS, PTE and PTI at Level

Results of Cointegration Test

Table 3 includes results of regression on cointegration equations which indicate statistical significance of all estimated equations via OLS method except linear combination of PIFS and GDP. The Values of t-statistic and values of coefficients of constants are

statistically significant. Equations of linear combination, the positive sign of slopes indicates a positive relationship among GDP and remaining variables, which indicates that due to an increase in GDP, the values of remaining variables also increase and vice versa.

TABLE 3
Cointegration between Linear Combinations and ADF Test on Residuals at Level

Equation of Cointegration	Slope	t-Statistic of Slope	D.W. Stat.	ADF Test			
				ADF values	Critical Values at		
					1%	5%	10%
GDP = f(PETS)	0.0016	2.006	1.584	-4.563	-3.64	-2.97	-2.63
PETS = f(GDP)	70.376	2.006	2.221	-4.565	-3.64	-2.97	-2.63
DGP = f(PIFS)	0.0005	0.531	1.498	-5.882	-3.63	-2.96	-2.61
PIFS = f(GDP)	18.268	0.531	2.092	-4.407	-3.63	-2.96	-2.61
GDP = f(PTE)	0.0056	2.933	1.427	-6.569	-3.64	-2.94	-2.62
PTE = f(GDP)	38.061	2.933	2.317	-4.255	-3.64	-2.94	-2.62
GDP = f(PTI)	0.0048	3.037	1.801	-6.526	-3.65	-2.97	-2.63

Table 3 also shows results of ADF test on residuals, which were computed from linear combinations of variables under consideration via OLS method. Results of ADF test indicate that critical values at 1%, 5% and 10% are greater than calculated values of ADF. Thus, study rejects null hypothesis of this test and finds absence of unit root in series of residuals of variables under consideration and series of residuals are stationary at level and integrated of order one i.e. I (0). However, residuals series by regressing PTI on GDP have still problem of unit root but possibility exists for unidirectional movement from GDP to PTI.

Results of Johansen's Cointegration Test
Table 4 shows the results of Johansen's Cointegration Test, which indicates that critical values at 5% are greater than the trace values. Thus, study rejects null hypothesis of this test and finds the absence of cointegration among variables under consideration in long run, but variables travel together in short run having a short run relationship rather than long run relationship.

TABLE 4
Johansen's Cointegration Test

No. of CE(s)	Eigen values	Trace statistics	Critical value at 5%	Critical value at 1%
None	0.538479	64.00355	68.52	76.07
At most 1	0.47462	38.48706	47.21	54.46
At most 2	0.283583	17.24716	29.68	35.65
At most 3	0.162488	6.241911	15.41	20.04
At most 4	0.011759	0.390349	3.76	6.65

Note. CE(s) indicates the Cointegration Equations and Trace statistics shows the absence of cointegration in long run at 1% and 5%.

Results of Granger Causality Test
Granger Causality Test has been employed to explore the directions of causality among GDP and remaining variables under consideration namely; PETS, PIFS, PTE, and PTI. Lags length has been used based on Bayesian information criterion (BIC). Table 5 shows the results of Granger Causality test at 2 lag period.

TABLE 5
Results of Granger Causality Test at Lag 2

Null Hypothesis:	Observations	F-Statistic	Probability	Decision
PETS ⟹ GDP	33	0.35712	0.70283	Fail to reject
GDP ⟹ PETS		4.33628	0.02288	Reject
PTE ⟹ GDP	33	2.41247	0.10798	Reject
GDP ⟹ PTE		2.34090	0.11480	Reject
PIFS ⟹ PETS	33	2.58787	0.09305	Reject
PETS ⟹ PIFS		2.49646	0.10054	Reject
PTE ⟹ PETS	33	6.12467	0.00622	Reject
PETS ⟹ PTE		0.32277	0.72680	Fail to reject
PTI ⟹ PETS	33	7.48384	0.00249	Reject
PETS ⟹ PTI		0.54151	0.58784	Fail to reject

Note. Right arrows, ⟹ indicates sentence "does not Granger Cause".

In case of GDP and PETS, a unidirectional nature of causality has been found and the causality runs from GDP to PETS, which indicates that an increase in PETS based on an increase in GDP. In case of PTI and PETS, a unidirectional nature of causality has also been found and the causality runs from PTI to PETS, which indicates that an increase in PETS based on an increase in PTI. In case of GDP and PTE, a bidirectional nature of causality has been found and the causality runs from GDP to PTE and vice versa, which indicates that an increase in GDP based on an increase in PTE and vice versa. In case of PETS and PIFS, a bidirectional nature of causality has also been found and the causality runs from PETS to PIFS and vice versa, which indicates that an increase in PETS based on an increase in PIFS and vice versa. In case of PETS and PTE, a unidirectional nature of causality has been found and the causality runs from PTE to PETS, which indicate that an increase in PETS based on an increase in PTE. However, in case of relationship of GDP with PTI and PIFS, nature of causality has not been found, which indicates that an increase in PTI and PIFS is not based on an increase in GDP and vice versa.

CONCLUSIONS AND RECOMMENDATIONS

The first null hypothesis has been rejected and concluded that, there is a significance relationship between Pakistan's exports to SAARC and GDP of Pakistan. Granger causality test confirmed unidirectional nature of causality, which runs from GDP to Pakistan's exports to SAARC. Present study failed to reject second null hypothesis but reject third null hypothesis and concluded that GDP does Granger cause Pakistan's exports to SAARC, which supported the growth-led hypothesis and theory of Customs Union at regional level. A bidirectional link has also been found between GDP and Pakistan's total exports. The nature of causality runs from Pakistan's total exports to GDP and vice versa. Present study is also in line with empirical studies of Alam (2011); Ullah et al. (2009); Omisakin (2009) and Shirazi & Manap (2004), which supported the export led growth hypothesis. A unidirectional link has also been found between Pakistan's exports to SAARC and Pakistan's total imports. The causality runs from Pakistan's total imports to Pakistan's exports to SAARC, which supports the Endogenous Growth Theory. It has also been concluded that the enhancement of Pakistan's exports to SAARC depends on the reduction of technology gab. So, the government of Pakistan should also give attention on imports from developed nations for removing technology gap.

The government of Pakistan should take measures to enhance the economic growth and exports. The government of Pakistan should develop mindful policy to attract foreign investment and domestic investment, which will be valuable in terms of improving

productivity, quality, technology and skill development, encouraging capacity building and cost competitiveness. The government should evaluate existing structure of export sector and encourage its relations with SAARC via application of a common approach. The government should invest in those areas of export sectors in which Pakistan has export potential in context of regional cooperation. The government of Pakistan should also arrange workshops and seminars on the significance of regional integration to widespread understanding of trade and the appropriate application on the agreement.

The identification of areas in Pakistan's exports sector having export potential to the SAARC countries will be fruitful for Pakistan's economic growth. Further, the identification of these areas will also leads to SAARC member countries prove to enhance the inter-SAARC trade.

REFERENCES

Ali, E., & Talukder, D. K. (2009). Preferential Trade among the SAARC Countries: Prospects and Challenges of Regional Integration in South Asia. *JOAAG , 4* (1).

Azhar, A. K., Elliott, R. J., & Milner, C. R. (1998). Static and Dynamic Measurement of Intra-Industry Trade and Adjustment: A Geometric Reappraisal. *Weltwirtschaftliches Archiv , 134* (3), 404-422.

Baier, S. L., Bergstrand, J. H., & Egger, P. (2007). The New Regionalism: Causes and Cons Equences. *Economie international , 109*, 9-29.

Clark, D. P. (2009). Adjustment Problems in Developing Countries and the U.S.-Central America-Dominican Republic Free Trade Agreement. *The International Trade Journal , 23* (1), 31-53.

Clark, D. P. (2002). Intra-Industry Specialization and the North American Free Trade Agreement. *The International Trade Journal , 16* (4), 393-411.

Das, D. R. (2008). *Regional Trading Blocs.* Retrieved 10 8, 2011, from Indira Gandhi National Open University: www.egyankosh.ac.in/handle/123456789/26141

Downnews. (2011). *2011 NATO attack in Pakistan.* Retrieved 1 27, 2012, from www.down.com: http://www.dawn.com/tag/nato-attack-in-pakistan

Espersen, M. (2011). Regional Trade Agreements in the Developing World: Does Intraregional Trade Depend on Level of Mutual Obligation? Aarhus School of Business, Aarhus University .

FTA, P.-C. (2006, November 24). Free Trade Agreement between the Government of Islamic Republic of Pakistan and the Government People's Republic of China. Islamabad.

Grubel, H. G., & Lloyd, P. J. (1975). *Intra-Industry Trade: The Theory and Measurement of International Trade in Differentiated Products.* London: Macmillan.

Pakistan, E. S. (2010). *Pakistan Economy Survey 2009-10.* Islamabad: Finance Division.

Ricardo, D. (1817). *On The Principle of Political Economy And Taxation.* London: John Murray.

Riezman, R., Whiteman, C. H., & Summers, P. M. (1996). `The Engine of Growth or Its Handmaiden? A Time-Series Assessment of Export-Led Growth. *Empirical Economics , 21*, 77-110.

Ruffin, R. J. (2002). David Ricardo's Discovery of Comparative Advantage. *History of Political Economy , 34* (4), 727-748.

SAARC. (2011). *Agreement on SAARC Preferential Trading Arrangement (SAPTA)*. Retrieved 10 8, 2011, from SAARC: From: http://www.saarc-sec.org/uploads/document/SAPTA%20Agreement_20110812120334.pdf

SBP. (2010). *State Bank of Pakistan Yearbook 2010.* Retrieved 7 10, 2011, from www.sbp.org.pk

Shan, J., & Tian, G. G. (1998). Causality between Exports and Economic Growth: The Empirical Evidence from Shanghai. Malden, USA : Blackwell Publishers Ltd.

Shelburne, R. C. (1993). Changing Trade Patterns and the Intra-Industry Trade Index: A Note. *Weltwirtschaftliches Archiv , 129* (4), 829-833.

Siddique, M. A. (2007). *Regionalism, Trade and Economic Development in the Asia Pacific Region.* Bodmin, Cornwaa: MPG Books Ltd.

Smith, A. (1776). *The wealth of National.* New York: Publisher: Edwin Cannan (ed.) in 1937, Modern Library.

The United Nations. (2012, 04 25). United Nation Commodity Trade Statistics Database (UN COMTRADE). New York: United Nations Statistical Division.

Viner, J. (1950). *The Custom Union Issue.* New York: Carnegie endowment for Internation Peace.

Wikipedia. (2011). *Theory of endogenous growth* . Retrieved 10 12, 2011, from Wikipedia: http://en.wikipedia.org/wiki/Theory_of_endogenous_growth

WTO. (2012). *World Trade Organization*. Retrieved 2012, from www.wto.org.com