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Causality between GDP, Exports and Imports: Evidence from Indian Ocean RIM Associations Member Nations

Manbir Singh[1], Dr Jasdeep Kaur Dhami[2]

[1]Research Scholar, Department of Management, CT University, Ludhiana
[2]Professor, Department of Management, CT University, Ludhiana

Abstract: The world economy is experiencing rapid changes with globalisation playing a predominant role. The Indian Ocean Rim Association for Regional Cooperation (IOR-ARC) is the product of several events. IORA contains 22 member nations. The Indian Ocean is one of the major link for international trade and sea transport. Indian Ocean RIM accounts for 2.7 billion population of the world, rich in cultural, languages, religions, traditions, arts ,cuisines and economic development with diversity. The main objective of this paper is to analyse Causality between GDP, Exports and Imports: Evidence from Indian Ocean RIM Associations Member Nations. This paper analyse the relationship between GDP, Export and Import of Indian Ocean RIM Association member nations since 1980 using the Uni Root Testing, Co-Integration and Granger Causality.

Key Words: Indian Ocean RIM Association, GDP, Export, IOR-ARC

1. INTRODUCTION:

The world economy is experiencing rapid changes with globalisation playing a predominant role. There is also a general consensus on the need to adopt market friendly, liberal and private sector dominant policies. In fact almost all the countries are moving towards free market philosophy. The Indian Ocean region has a rich history of trade and cultural linkages dating back to many centuries. The Indian Ocean woven together by transmission of trade, commands the control of majority of the world's cargo ships, one third of the worlds cargo traffic and two thirds of total world's oil shipments. The Indian Ocean is one of the major link for international trade and sea transport. Indian Ocean RIM accounts for 2.7 billion population of the world, rich in cultural, languages, religions, traditions, arts ,cuisines and economic development with diversity. In spite of such diversity, member nations are bound together by the Indian Ocean.(iora.int)

2. THEORETICAL BACKGROUND:

The Indian Ocean Rim Association for Regional Cooperation (IOR-ARC) is the product of several events. These are global trends towards regionalism; adoption of market based economic policies in India and other countries in the Rim, emergence of a liberal international trade environment and the WTO, the end of apartheid and international isolation

of South Africa and the end of cold war and the collapse of socialism in the Soviet bloc. The concept of an IOR initiative was also publicly debated by the South African Foreign Minister, Pik Botha in November 1993. Pik Botha's idea was reinforced by President Nelson Mandela when he visited India in January 1995. Mandela recalled the Nehruvian Ideals of peace, secularism, democracy and a non-violent world. The proposal was beneficial for both Australian and Indian governments. In case of India , this was in accordance with the vision of India's first prime minister, Pandit Jawaharlal Nehru, who had motivated unity among the Indian Ocean economies. In the case of Australia this was according to 'Look West Policy'.

Between 29th to 31st March 1995, the Mauritian government organised a meeting to converse the prospects of enhancing economic cooperation. Representatives of seven countries consisting of Australia, India, Kenya, Mauritius, Oman, Singapore and South Africa attended along with members of the business sector and academics. This meeting agreed to adopt the principles of open regionalism and inclusivity of membership. It also established a tripartite working group to formulate proposals. In June 1995 Australia organised another meeting of the Indian Ocean Countries, the International Forum on the Indian Ocean Regions (IFIOR). The IFIOR was attended by several countries from all the subregions of the Indian' Ocean. It adopted a "second track" approach where the deliberations on regional cooperation were conducted among "non governmental" participants representing the industry, academic and officials in their personal capacity. There was also a follow up meeting in New Delhi in December 1995.The first meeting of Mauritius which was held during 15th August 1995 to 17th August 1995, supported the establishment of another process containing trade and academic networks. Next meeting was held at Mauritius between 10th September 1996 to 11th September 1996, which finalised a charter for creation of IOR-ARC, included Madagascar, Mozambique, Malaysia, Indonesia, Tanzania, Yemen and Sri Lanka. In the second Ministerial meeting of the IOR-ARC held in Maputo in March 1999 the membership was increased to 19 by adding five more Indian Ocean Rim Countries. These are Bangladesh, Iran, Seychelles, Thailand and United Arab Emirates. The dialogue partner status of IOR-ARC may be granted to individual sovereign countries not members of IOR-ARC, but with a special interested and/or capacity to contribute to IOR-ARC, particularly in the area of trade and investment. The total size of the membership is now 22.The IOR-ARC has massive economics potential and proffers substantial trade and investment opportunities. South Africa is a most important economic power and rich in minerals in Africa. Tourism is the major blessing for Eastern Africa. North Africa has oil rich countries. The South Asia has skilled human capital and enormous unexploited market. South East Asia is economically successful. Australia is a developed country and natural resources are in abundance. The IOR-ARC is basically an open regionalism concept. Tiwari(2004)

OBJECTIVE:

The main objective of this paper is to analyse Causality between GDP, Exports and Imports: Evidence from Indian Ocean RIM Associations Member Nations.

3. RESEARCH METHODOLOGY

Research is based on secondary data available on trademap and UNCOMTRADE This paper analyse the relationship between GDP, Export and Import of Indian Ocean RIM Association member nations since 1980 using the Uni Root Testing, Co-Integration and Granger Causality. The annual data (US dollar thousand) were Indian Ocean RIM Association member nations observations on log of GDP, log of export and log of import. Gupta ans Dhami (2020), Awokuse (2007), Kumari & Malhotra (2014) , Hussain, (2014) were applied Cointegration, causality on Economic growth, exports and imports. Bakari & Mabrouki (2017), Alhakimi (2018), Zestos & Tao(2002) also analysed the causal relationship.

Table 1.1: GDP, EXPORT and IMPORT of Indian Ocean RIM Association Member nations from 1980 to 2019

US Dollar thousand

Year	GDP	Export	Import
1980	1637129405351	249114346849	123297
1981	1705756987183	243762300925	138339
1982	1786902822553	268517431435	137725
1983	1833345097230	284144429193	138413
1984	1893492637000	288969380985	138489
1985	1949974243839	293551607014	126778
1986	1972769365755	304683402145	123864
1987	2042136738228	352904337282	143131
1988	2152698746413	397493676022	177691
1989	2282000340607	431782514453	214937
1990	2429789448860	474586543987	255200
1991	2510557557395	529957158222	283848
1992	2600687673313	573694425671	305235
1993	2719801719523	636968261190	330452
1994	2862649376068	706631632172	381076
1995	3030984173388	784607917519	465078
1996	3212697067302	833178060437	488577
1997	3333520862486	882762851453	499639
1998	3332818979800	916663462863	412243
1999	3487868228642	934404000888	446465
2000	3663603149559	1067001473770	519923
2001	3764992820272	1065763623257	485904
2002	3925077984604	1120019351212	510746
2003	4146727470851	1204248826833	596879
2004	4394569104200	1363872009141	770869
2005	4629556532834	1518773710936	940084
2006	4904472505655	1669459774256	1087294

2007	5204763699004	1777968155395	1265988
2008	5381821786757	1882928360293	1615231
2009	5536578750111	1748687278975	1289819
2010	5866728148356	1983743617395	1639530
2011	6121753774139	2149684020743	2040586
2012	6370999878368	2179826887707	2200484
2013	6646994302639	2279440869762	2202390
2014	6964082909513	2352557611632	2164449
2015	7282450192937	2384383565733	1874445
2016	7695528207755	2476920405557	1770418
2017	8059843122768	2611792117836	2000117
2018	7836553152940	2780656137474	2198336
2019	8122764296071	2759306351227	2097082

Source:trademap.org

Empirical Results

UNIT ROOT

H0: GDP has a unit root

Second Difference

			t statistics	Proability*
Augmented Dickey Fuller			-7.388277	0.0000
Test critical values	1per cent		-3.621023	
	5 per cent		-2.943427	
	10 per cent		-2.610263	
MacKinnon, 1996, one sided p vales.				
F statistic	39.75	Durbin Watson statistic		2.00
Prob(F statistic)	0.000000			

Table 1.2 describes the ADF Unit Root Test on GDP of members of Indian Ocean RIM Association. To check the reliability of test the value of Durbin-Watson Statistics is analysed and the value of Durbin Watson is 2.00, so it is concluded that there is no autocorrelation is detected in the series. The value of ADF is -7.388277, which is less than p value. The null hypothesis is rejected and it is concluded that series is stationery at second difference.

H0: Export has a unit root

Table 1.2 Unit Root Test on Log(Exports) of members of Indian Ocean RIM Association(Second difference unit root)

Table 1.2 Unit Root Test on Log(Exports) of members of Indian Ocean RIM Association.

			t Statistic	Probability*
Augmented Dickey Fuller test statistic			-6.98	0.0000
Test critical values:	1 per cent		-3.615588	
	5 per cent		-2.941145	
	10 per cent		-2.609066	
MacKinnon 1996, one sided p values				
F-statistic	48.65	Durbin-Watson stat		2.1
Prob(F-statistic)	0.000000			

Table 1.2 describes the ADF Unit Root Test on Log(Exports) of members of Indian Ocean RIM Association. To check the reliability of test the value of Durbin-Watson Statistics is analysed and the value of Durbin Watson is 2.1, so it is concluded that there is no autocorrelation is detected in the series. The value of ADF is -6.980066, which is less than p value. The null hypothesis is rejected and it is concluded that series is stationery at second difference.

H0: Log (Import) has a unit root

Table 1.3 First Difference

			t-Statistic	Prob.*
Augmented Dickey Fuller test statistic			-6.7	0.0000
Test critical values:	1per cent		-3.62	
	5 per cent		-2.94	
	10 per cent		-2.60	
MacKinnon, 1996, one sided p values				
Durbin-Watson stat	2.1			

Table 1.3 describes the ADF Unit Root Test on Log(Imports) of members of Indian Ocean RIM Association. To check the reliability of test the value of Durbin-Watson Statistics is analysed and the value of Durbin Watson is 2.1, which is near to 2.0 so it is concluded that there is no autocorrelation is detected in the series. The value of ADF is -6.980066, which is less than p value. The null hypothesis is rejected and it is concluded that series is stationery at first difference.

H0: No deterministic Trend

Table 1.4 Cointegration Test

Hypothesised		Trace	0.05	
No of CE(s)	Eigen value	Statistics	Critical value	Probability **
None *	0.488798	39.35550	24.27596	0.0003
At most 1 *	0.208426	13.85782	12.32090	0.0274
At most 2 *	0.122737	4.976024	4.129906	0.0305
Trace test indicates 3 cointegrating eqn(s) at the 0.05 level				
* denotes rejection of the hypothesis at the 0.05 level				
**MacKinnon-Haug-Michelis (1999) p-values				

Co-integration test examine the existence of long run relationship between GDP ,export and import from IORA member nations. The p value is less than 0.05 and this explains the rejection of null hypothesis. A long run association exists in case of GDP, Export and Import of IORA member nations**.**

Table 1.5 Granger Causality

Null Hypothesis:	Obs	F-Statistic	Prob.
LOGIMPORT does not Granger Cause LOGGDP	38	0.23826	0.7893
LOGDP does not Granger Cause LOGIMPORT		3.84343	0.0316
LOGEXPORT does not Granger Cause LOGGDP	38	2.11171	0.1371
LOGGDP does not Granger Cause LOGEXPORT		2.02411	0.1482
LOGEXPORT does not Granger Cause LOGIMPORT	38	3.32736	0.0483
LOGIMPORT does not Granger Cause LOGEXPORT		2.07739	0.1413

The results explain that Import does not Granger cause GDP, while GDP Granger cause Import. Hence, results show that causality is unidirectional. Export does not Granger Cause GDP and GDP does not Granger Cause export. Export Granger Cause Import and Import does not Granger Cause Export. There is no casual relational ship exists between Export and GDP. In other case, Export Granger cause import, but import does not Granger cause export.

4. CONCLUSION AND POLICY IMPLICATIONS:

The main aim of this paper was to analyze the causality between GDP, Export and Import of 22 member nations of Indian Ocean RIM Association. The unit root test was applied to test the series stationery status. Co-integration test examine the existence of long run relationship between GDP, export and import from IORA member nations. This paper of trivarite analysis explains the path IORA member nation's causal relationship between GDP, Export and Import. This study reveals the testable hypothesis about the arrangement of the relationship between economic growth and international trade. The majority of the studies were focused on bivarite analysis, this study focused on the causality relationship among three variables. The empirical findings provide significant implications for policy makers. For IORA members a stable economic environment, suitable infrastructure, better employment

opportunities, proper utilisation of resources have most important impact on economic growth. Proper utilsation of natural resources is required for sustainable growth. Major countries of IORA are rich is marine and natural resources.

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