

Gulf Cooperation Council (GCC) and Regional Integration in Asia

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Abstract

In Asia, SAARC (South Asian Association of Regional Cooperation), ASEAN (Association of South East Asian Nations) and GCC (Gulf Cooperation Council) are being considered as an active regional trading blocs although East Asian integration is on primary cooperation stage and BIMSTEC is treated as organised sub-regional trading bloc. The GCC has completed all criterion of economic integration except introduction of a single currency and ASEAN is advancing its optimum stage of monetary integration but the advancement of SAARC is halted by the shock of non-cooperation from Pakistan. Therefore, contribution of GCC in integrating Asian bloc is to scrutinise in a new outlook. In this paper, the author endeavours to show the impact of economic integration of Gulf Cooperation Council (GCC) on the Asian economic integration in the sense that the process of integration of GCC with SAARC and ASEAN can accelerate the criterion of Asian integration process. Therefore, the author used cointegration and vector error correction model among the indicators of trade integration of exports such as Asian export share, intra export share of GCC, export concentration index of GCC, ASEAN's export with GCC and SAARC's export with GCC during 1995-2019. Similarly, the author applied same methodology among the trade indicator of imports such as Asian import share, intra import share of GCC, import concentration index of GCC, ASEAN's import with GCC and SAARC's import with GCC during the specified period. The findings revealed that Asian export share has long run significant causalities with SAARC and ASEAN export shares to GCC. Intra export share of GCC has long run causalities with SAARC and ASEAN export shares to GCC. The export concentration index of GCC has significant long run causalities with SAARC and ASEAN export shares to GCC respectively. Even, the short run causalities from export concentration index of GCC to intra export share of GCC, export share of ASEAN and SAARC with GCC and the short run causality from ASEAN export share with GCC to export share of Asia and from intra export share of GCC to export share of ASEAN with GCC were strictly observed. Again, the import share of Asia has long run causalities with the import shares of ASEAN and SAARC with GCC. The intra import share of GCC has long run causalities with the import shares of ASEAN and SAARC with GCC and the import concentration index of GCC has long run causalities with the import shares of ASEAN and SAARC with GCC respectively. The intra import share of GCC has short run causalities with import share of Asia, import concentration index of GCC and import share of ASEAN with GCC respectively. The import concentration index has short run causality with the import share of Asia. The import share of SAARC with GCC has short run causality with import share of ASEAN with GCC. The cointegration and vector error correction among Asian GDP, sum of intra export and import shares of GCC, sum of export and import shares of ASEAN with GCC, and sum of export and import shares of SAARC with GCC during 1995-2019 indicated that the GDP of Asia has long run causalities with the sum of intra export and import shares of GCC, the sum of export and import shares of ASEAN with GCC and the sum of export and import shares of SAARC with GCC and even they have short run causalities also. All these observations can justify that GCC has great impact on Asian economic integration process associated with SAARC and ASEAN.

JEL Classification: B22, C01, C22, C33, F15, F53, F55, N25

Keywords: Gulf Cooperation Council, Asian integration, SAARC, ASEAN, Growth, intra export share, intra import share, Asian share, export concentration index, import concentration index.

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Introduction

The Gulf Cooperation Council (GCC) is consisting of six countries namely, United Arab Emirates, Saudi Arabia, Qatar, Oman, Kuwait and Bahrain respectively and was set up on 11th November, 1981. The bloc has

created custom union in January 2003, established common market in 2007 and planned to issue common currency in 2010 although it had not introduced till today. Its GDP is 1.638 trillion US\$ which is 11th in the world and its GDP per capita is estimated as 71205US\$ whose rank is 7th in the world. The human development index of GCC is quite high of 0.840 with a low Gini of 28.7 which implies that inequality of income is low. The world export and import shares of GCC are now 4.088 % and 2.693% and its' Asian export and import shares are 40.875% and 37.747 % respectively in 2019. The intra export and import shares of GCC are 10.66% and 2.693% respectively in 2019. The bloc GCC has been growing unprecedentedly since its intra export and import shares have been catapulting at the rates of 1.76% and 2.26% per year during 1995-2019 and its export share and import share with ASEAN have been rising at the rates of 9.32% and 8.08% per year and moreover its export and import shares with SAARC have been increasing at the rates of 8.76% and 7.93% respectively during the same period.

The role of GCC in Asian economic integration cannot be denied at all. Its economic and political relation with SAARC and ASEAN in speeding up integration process showed a new light in regional and sub-regional growth of trade and development specially in Asia and in the Indian Ocean region.

The several ASEAN-GCC ministerial meetings since 2009 June, followed by 2010 June & November, 2011 May & 2011 June and in 2013 November revealed the fruitful cooperation in the areas of education, tourism, food security and agricultural investment, economic cooperation and development and free trade areas and so on. The Ministers between GCC and ASEAN also committed to further strengthen and promote cooperation in the areas of energy, climate change, food security, people-to-people contacts, tourism and education, and further expressed support for enhancing the prospects of future cooperation in the fields of labour, improving preparedness for future global economic crisis, enhanced consular cooperation, electricity, water, transport, communications, planning, development, communications and information technology respectively.

The SAARC-GCC trade cooperation is rather complex since UNESCAP (2017) argued that the intergovernmental institutions (among 11 regional institutions, only 6 have trade agreements in force) formulated GCC's custom union which removed all internal tariff barriers and imposed a common external tariff to SAFTA between SAARC members.

GCC is a net importer of food from SAARC and SAARC is a net importer of oil and gas from GCC. But GCC faced huge trade barriers from SAARC and other Asian countries while GCC's tariff rate ranges from 1.5%-2% to South Asia.

India-GCC economic relationship is quite bold and historic since India imports 42% of oil from GCC and it is the largest regional trading bloc but India-GCC free trade agreement is not yet finalised although agreement in economic cooperation was signed in August 2004. India-Gulf region's sea lines of communication remains open and flowing. Moreover, India-Gulf naval security through Indian ocean was established in 2008.

China-GCC negotiations opened in June 22-24, 2009. China- GCC trade and economic joint committee discussed on 31 July, 2011 for boosting bilateral trade, investment and technological co-operation. China imported oil from GCC states and exported machinery, electronic products, garments and luggage etc. Chinese FDI to GCC has been catapulting gradually. China-GCC FTA which was introduced in 2009 can promote bilateral trade and East Asian trade integration (Chen, 2011).

GCC-Japan economic relation depends on trade cooperation with diplomatic strategy since 1955 in association with USA on the issue of security and development assistances. GCC-Japan FTA negotiations since 2006 were on dynamic process in the areas of trade and investment, rules of origin, custom procedures and disputes settlements etc to achieve liberalisation consistent with WTO. Japan imports oil from GCC and exports motor vehicles, machinery, iron/steel, electronic machines, rubber, textiles and foodstuffs etc (Calder, 2015).

Thus, the central aims of the paper are to find out the factors of GCC's trade with SAARC and ASEAN by which can influence trade of Asia where the paper selected the determinants such as GCC's export and import share with SAARC, export and import concentration index of GCC in one hand and GCC's export and import shares with ASEAN on the other hand. Even, the paper tried to check the impact of intra export and intra import of GCC on Asia's trade (Asia's export and import share) so that the results can infer the progress of trade integration in Asia. How much the impact on Asia's growth and development due to GCC's trade with

SAARC and ASEAN was done through the indicators of sum of exports and import of GCC with SAARC and ASEAN and sum of intra export and import share of GCC and the aggregate GDP of Asia.

On the basis of the aims, the author endeavours to examine the impact of trade integration of GCC with SAARC and ASEAN on the trade integration of Asia subject to the said determinants and secondly, it examines the impact of aggregate trade indicators of GCC with SAARC and ASEAN on the aggregate GDP of Asian region by applying the methodology of Johansen cointegration and vector error correction models during 1995-2019 taking data from UNCTAD.

Some important studies

The author has incorporated a few relevant econometric and analytical research papers in the section of review of economic literature.

Wilson (2004) studied the economic cooperation among GCC, South Asia and ASEAN on financial assistance, development assistance, interbank transactions, citizen's portfolios and capital flows during 1970-1990.

Song (2010) cited many ministerial negotiations between GCC and ASEAN in the field of economic integration process since 1990 especially in common market, trade cooperation in "food for oil", social and economic security. The author showed the prospects and problems of ASEAN-GCC free trade area, promotion of trade and financial cooperation and infrastructure development, migration and tourism.

Pradhan (2010) studied the GCC-SAARC economic relations in the new strategic geo-economic interactions involving energy and Petro-dollar investment, cheap consumer goods, knowledge-driven technologies and migrant labour etc. During 2004 – 2008, their trade increased more than six-fold including tourism. Now both GCC and SAARC become interested in spread to investment, labour migration, remittances, food security, etc.

Al-Tamimi (2013) explained the trade relationship between GCC and Asia which rose substantially over the past few years and Asia accounts for nearly 60% of GCC's total foreign trade. Asia's demand for energy is largely supplied by GCC and expected 90% of oil exports from the Middle East in the future where India and China are the dominant countries in Asia and this trade relationship might enhance GCC-Asia integration process.

The study of Koerner (2014) stated that the GCC's export to Non-Japan Asia are dominated by oil and gas as well as petroleum and plastic which account more than 80% of total export. Non-Japan Asia absorbs almost 60% of the GCC's energy export. China's oil import from GCC accounts 30% and Japan's import is found as 60%. The increased mutual investment interest between GCC and developing Asia has been intensified recently. From 2005- to 2012 Chinese FDI was 8% of all FDI but Chinese FDI into GCC is very small. GCC has close relation for FDI inflows and outflows from India, Pakistan, UK and USA etc. The relation of GCC with growing Asian market is linked with tele-communication and Islamic finance, research and development in high technology with transfer of technology and nuclear energy.

Janardhan (2014) analysed the prospects on ASEAN-China and GCC-Iran Ties which emphasised on Look East Policy. The paper studied the GCC-Asia Strategic Co-operation on security around Indian Ocean Rim Association especially on peace and stability with the influence of USA. Other than SAARC and ASEAN, GCC maintained economic cooperation with India, South Korea, Japan and USA.

Bhowmik (2014) cited the existence of GCC in Asian economic and trade cooperation excluding the performance in details but intended to focus on the role of SAARC+ ASEAN+EA which is politically and geographically compact, feasible and sustainable towards the process of Asian Economic Integration.

Cinar et al. (2016) applied gravity model with counterfactual methods to explain the trade between GCC and China citing the uses of former silk road during 1990-2013 and found that trade of GCC with China needs to recognise the possible interests of growth in China.

The gravity model of Kodithuwakku et al. (2016) between SAARC and GCC on food and agricultural export found that dependence of GCC on SAARC increased gradually where it rose from 13% to 15% from 2007 to 2012 where India was the leading country with higher trade intensity.

Zhen and Xinyi (2017) studied the dynamism of the Indian Ocean Regional integration analysis historically through the activities and establishment of SAARC, ASEAN, GCC, SADC, COMESA and IORA respectively. Their roles in trade integration in Asia, trade controls and regulations in custom union, regional convergence and coherence were also analysed.

In an essay in UKEssays (2018), it was found that GCC and ASEAN trade agreement and the economic integration were emphasised by Trade and Investment Framework Agreement, Free Trade Area, trade and investment opportunities, trade agreements with Singapore, ASEAN-GCC Action Plan and foreign direct investment respectively.

Pangestu and Armstrong (2018) explained that the plan of Asian Economic Community as well as framework of RCEP have potential effects for balancing China and Japan led Asian integration process and boosting for regional integration in Asia where the reform of RTA should be the prior agenda. Although, US led plurilateral agreement TPP and US-EU led TTIP in Asian integration process have been presented a balancing effect in 21st century in ASEAN+1 FTA program towards trade liberalisation in APEC. In this context, Nayyar (2018) wrote that a non-starter SAFTA, China minus East Asian Strategy, India-ASEAN FTA and non-introduction of ASEAN single currency are the major stumbling blocks in the progress of Asian Integration.

Adhikari et al. (2019) studied migration problem of South Asia with GCC analytically and stated that GCC and South Asian Region is the lowest cost corridor for remittance transfers as a result of migration of labour which vitalises the integration process. Both regular and irregular migrants from SAARC nations to GCC needs the affirmation of laws of migration and their social safety nets. It requires ministerial conference between GCC and SAARC and ASEAN with the initiative of ILO to implement policies of migration management relating to employment that may revitalise the Asian growth and integration.

Burton (2020) showed relation between GCC, India, China, Japan and Korea focussing energy dimension, exchanges, co-operation, partnership, foreign direct investment, link in roads and transport, investment in real estate, health care and financial services, security in Asian states etc. The paper also discussed on trade cooperation and strategy in future and concrete future plan on uncertainty.

Asian Development Bank (2021) assessed in its Asian Economic Integration Report 2021 that the integration process succeeded a lot yet to proceed a long way although the report is silent about the GCC. The assessments are as follows:[i]Asia has relatively strong regional value chain linkages as measured by regional value chain of global value chain integrity ratio although it emphasised new free trade agreement and subregional cooperation in CAREC, BIMSTEC, GMS and SASEC etc.[ii] Cross border investment is rising,[iii] Regional integration measured by integration index has been moving ahead,[iv] Regional co-operation must be strengthened although financial integration process is halted by covid-19 pandemic, [v] Digital technology improvement is essential.

Methodology and Source of Data

The paper assumed:

IX=Intra export share of GCC (% of bloc),IM=Intra import share of GCC(% of bloc), XCI =export concentration index of GCC,ICI=Import concentration index of GCC, GAM=Import of GCC from ASEAN(in million US\$),GAX=export of GCC from ASEAN(in million US\$), GSM=import of GCC from SAARC(in million US\$),GSX=export of GCC from SAARC(in million US\$),GDPA=GDP of Asia in billion US\$.,XA=export share of Asia (% of world), IA=Import share of Asia(% of the world).The data of these variables have been collected from UNCTAD (<https://unctadstat.unctad.org/wds/TableViewer/tableView.aspx?ReportId=24397> Report Id=24397).

The semi-log linear regression model is used to clarify the growth rates. The estimated equation can be written as: $\log(x_i)=a+bt+u_i$ where x_i =variable to be estimated, a and b are constants, t=time(year), u_i =random error, for all values of $i=1,2,3,\dots,n$.

Cointegration and Vector Error Correction models of Johansen (1988,1991) have been applied for long run association and causalities among the variables.

The approach of Johansen models (1988,1991) has been elaborated below in brief.

If the $m \times 1$ vector time series Y_t contains more than 2 components, each being $I(1)$, then there may exist $k (< m)$ linearly independent $1 \times m$ vectors $\alpha_1, \alpha_2, \dots, \alpha_k$ such that $\alpha' y_t \sim I(0)$ $k \times 1$ vector process where $\alpha = (\alpha_1, \alpha_2, \dots, \alpha_k)$ is a $k \times m$ cointegrating matrix.

Let VAR(p) [Vector Auto Regressive] model is given below,

$$Y_t = \delta D_t + \phi_1 Y_{t-1} + \dots + \phi_p Y_{t-p} + \varepsilon_t \quad (1)$$

Where Y_t is a time series $m \times 1$ vector of $I(1)$ variables. The VAR(p) model is stable if

$$\text{Determinant } (I_n - \phi_1 z - \dots - \phi_p z^p) = 0$$

If there are roots on the unit circle then some or all the variables in Y_t are $I(1)$ and they may be cointegrated. If cointegration exists the VAR model is transferred to VECM (Vector Error Correction Model) which is given below.

$$\Delta Y_t = \Gamma_0 D_t + \Pi Y_{t-1} + \sum_{j=1}^{p-1} \Gamma_j \Delta Y_{t-j} + \varepsilon_t \quad (2)$$

Where D_t = vector deterministic variables (constants, trends, and/or seasonal dummy variables)

$\Gamma_j = I + \phi_1 + \dots + \phi_j$, for all values $j=1, 2, \dots, p-1$ are $m \times m$ matrix.

$\Pi = \gamma A$ is the long run impact matrix, A and γ are $m \times k$ matrices,

ε_t are $N(m, \Sigma)$ errors.

Determinant $(I - \sum_{j=1}^{p-1} \Gamma_j B^j)$ has all its roots outside the unit circle.

Assume VECM errors are independent $N(m, \Sigma)$ distribution, then given CI restrictions on the trends/drift/no drift parameters, the likelihood $L_{\max}(k)$ is a function of the CI rank k .

The Trace test is based on log-likelihood ratio (LR),

$$LR = 2 \ln [L_{\max}(\text{unrestricted}) / L_{\max}(\text{restricted})] \text{ for } k = m-1, \dots, 1, 0.$$

The Test H_0 : CI rank $\leq k$ Vs H_1 : CI rank $> k$. If the LR is greater than the critical value for a certain rank, then H_0 is rejected.

The Trace Test: $LR_{\text{trace}}(k) = -2 \ln \Lambda = -T \sum_{i=k+1}^m \ln(1 - \lambda_i)$ where λ_i denotes the descending ordered Eigen values $\lambda_1 > \lambda_2 > \dots > \lambda_m > 0$ of the determinant $(\lambda S_{11} - S_{10} S_{00}^{-1} S_{01}) = 0$

If $LR_{\text{trace}}(k) > CV$ (for rank k), then H_0 (CI rank k) is rejected.

Alternatively,

$LR_{\max}(k) = -2 \ln \Lambda = -T \ln(1 - \lambda_{k+1})$ is called the maximal Eigen value statistic. Test H_0 : CI rank $= k$ Vs H_1 : CI rank $= k+1$.

The unit circle and impulse response functions analysis were applied in the residual test to verify the stability and stationarity of VECM. The cointegrating equation usually expressed the long run causality of the variables.

The impulse response function can be expressed as MA (Moving Average) process which is derived from VAR(p) model as,

$$Y_t = c + \varepsilon_t + \psi_1 \varepsilon_{t-1} + \psi_2 \varepsilon_{t-2} + \dots + \psi(B) \varepsilon_t \quad (3)$$

$$\Delta y_{t+1} / \delta \varepsilon_t = \psi_1$$

The row i , column j element of ψ_1 identifies the consequences of one unit increase in the j th variable's innovation at date $t(\varepsilon_{tj})$ for the value of the i th variable at time $t+1$, holding all other innovations at all dates constant. A plot of the row i , column j element of ψ_1 as a function of lag l is called the non-orthogonalized impulse response function.

To justify the short run causality the Wald Test (1943) has been applied for analysis.

The Wald test (1943) has been explained in brief which is relevant in this analysis.

Y_t in a VAR(p) process if divided into sub-processes z_t and x_t i.e., $\dot{Y}_t = (\dot{x}_t, \dot{z}_t)$. Causality is defined by zero constraints on VAR coefficients and when in VAR(p) system, it is tested zero constraints for the coefficients to derive asymptotic test considering $ca = c \Leftrightarrow A_{jki} = 0$ in a manner of:

$H_0: ca = c$ against $H_1: ca \neq c$ where c is an $N \times (k^2 p + k)$ matrix of rank N and c is an $(N \times 1)$ vector. Assuming that $\sqrt{T}(c\hat{a} - a) \cap N[(0, \Gamma^{-1} \Sigma_u)']$ is a least square/maximum likelihood estimation and then we get $\sqrt{T}(c\hat{a} - ca) \cap N[0, c(\Gamma^{-1} \Sigma_u) c']$. Hence the Wald statistic is given by

$$T(c\hat{a} - c)[c(\Gamma^{-1} \Sigma_u) c']^{-1} (c\hat{a} - c) \cap \chi^2(N) \quad (4)$$

Then we replace Γ and I_u by their unusual estimator

$\Gamma = \alpha\alpha' / T$ and $\Sigma_u = T / (T - k_p - 1) \alpha \Sigma_u \alpha'$, then the resulting statistic becomes

$$\lambda_w = (\alpha - a) [c((\alpha\alpha')^{-1} \Sigma_u \alpha')^{-1} (\alpha - a)] \quad (5)$$

It is still asymptotic χ^2 distribution with N degree of freedom and it has the condition of $[c((\alpha\alpha')^{-1} \Sigma_u \alpha')^{-1} / T]$ which is a consistent estimator of $[c(\Gamma^{-1} \Sigma_u \alpha')^{-1}]$

Hence, we have the following result: The asymptotic distribution of the Wald statistic supposed:

$\sqrt{T} (\alpha - a) \cap N[(0, \Gamma^{-1} \Sigma_u)]$ holds and in practice, $NF(N, T) \cap \chi^2(N)$ as t tends to infinity where $F(N, T)$ indicates as F random variable with N and T degrees of freedom because $F(N, T)$ distribution has flatter tail than the $\chi^2(N)/N$ distribution and it is reasonable to consider the test statistic $\lambda_F = \lambda_w / N$ in conjunction with critical values from the F - distribution.

Results and Observations of Econometric models

1. Impact of GCC on Asian integration. Asian export share, intra export share of GCC, export concentration index of GCC, ASEAN's export with GCC and SAARC's export with GCC during 1995-2019 have long run association as evident from Johansen unrestricted cointegration test among the first difference series of those variables with linear deterministic trend in which Trace statistic and Max Eigen statistic produced three cointegrating equations each. The values of statistic with probabilities of critical values of 5% significant level are shown below in Table 1. It implies that SAARC and ASEAN exports with GCC and intra export of GCC have greatly influenced the Asian export share in the long run which developed the economic integration in Asia.

Table 1. Johansen cointegration

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Probability**
None *	0.898114	122.8232	69.81889	0.0000
At most 1 *	0.785900	70.29349	47.85613	0.0001
At most 2 *	0.612173	34.84329	29.79707	0.0120
At most 3	0.413674	13.05780	15.49471	0.1127
At most 4	0.033284	0.778561	3.841466	0.3776
		Max-Eigen Statistic		
None *	0.898114	52.52966	33.87687	0.0001
At most 1 *	0.785900	35.45021	27.58434	0.0040
At most 2 *	0.612173	21.78549	21.13162	0.0404
At most 3	0.413674	12.27923	14.26460	0.1006
At most 4	0.033284	0.778561	3.841466	0.3776

* denotes rejection of the hypothesis at the 0.05 level, **MacKinnon-Haug-Michelis (1999) p-values, Total observations after adjustment=23.

Source-Calculated by author.

The estimated first equation of VECM revealed that the incremental Asian export share is insignificantly positively related with previous period's incremental intra export share of GCC, export concentration index of GCC, SAARC export to GCC respectively but is significantly negatively related with the incremental ASEAN's export to GCC of the earlier period. Here, three error correction terms are insignificant but they are moving towards equilibrium. The values of F and R² are low. In the second equation, it was found that the incremental intra export share of GCC is insignificantly negatively related with incremental export share of Asia and SAARC export to GCC of the previous period but significantly negatively related with incremental export concentration index of GCC of earlier period and even insignificantly positively related with ASEAN export of GCC of the previous period. The values of R² and F are high. EC1 is convergent but EC2 and EC3 are divergent where all of the three are insignificant. The estimated third equation states that the incremental export concentration index of GCC is insignificantly positively related with previous period of incremental export share of Asia, intra export share of GCC and export of SAARC to GCC but insignificantly negatively related with export share of ASEAN to GCC of the previous period. Here, R² is medium and F is insignificant. The three error correction terms are insignificant but convergent. The estimated fourth equation implies that the change of ASEAN's export share to GCC is significantly positively influenced by incremental export concentration index of GCC and intra export share of GCC of the previous period and insignificantly positively related with incremental export share of SAARC to GCC of earlier period. Here, R² is high and F is significant. EC1 is divergent but EC2 and EC3 are convergent and EC2 is significant. The estimated fifth equation states that the change of export share of SAARC to GCC is insignificantly positively related with incremental intra export share and export concentration index of GCC of previous period and insignificantly

negatively related with previous period's incremental export share of Asia and export share of ASEAN to GCC respectively. The R² is high with significant F. The EC1 is divergent and significant, EC2 is convergent and significant and EC3 is convergent and insignificant.

Table 2. Vector Error Correction Model

	dXA _t	dIX _t	dXCI _t	dGAX _t	dGSX _t
EC1	-0.427357	-0.183830	-0.004730	5216.104	7976.464
t values	[-1.32225]	[-0.89582]	[-0.42672]	[1.63124]	[2.01414]*
EC2	-0.637881	0.421483	-0.024038	-18392.90	-14836.30
t values	[-1.18619]	[1.23446]	[-1.30344]	[-3.45711]*	[-2.25162]*
EC3	-21.58151	8.474395	-0.720506	-213798.1	-71806.69
t values	[-1.83544]	[1.13514]	[-1.78681]	[-1.83785]	[-0.49840]
dXA _{t-1}	0.031957	-0.246469	0.007779	-518.8528	-1860.185
t values	[0.10025]	[-1.21783]	[0.71161]	[-0.16453]	[-0.47627]
dIX _{t-1}	0.426761	-1.274874	0.028037	12907.14	10787.12
t values	[0.90932]	[-4.27842]*	[1.74202]	[2.77979]*	[1.87583]
dXCI _{t-1}	36.04580	-33.21719	0.975219	507157.8	443710.8
t values	[1.94068]	[-2.81673]*	[1.53103]	[2.75989]*	[1.94964]
dGAX _{t-1}	-0.000186	3.86E-05	-2.60E-06	-0.991979	-1.286571
t values	[-2.35149]*	[0.76715]	[-0.95578]	[-1.26478]	[-1.32451]
dGSX _{t-1}	0.000106	-3.66E-05	2.17E-06	0.661380	1.006094
t values	[1.77665]	[-0.96821]	[1.06351]	[1.12250]	[1.37874]
C	0.908849	0.210557	-0.009715	6164.525	7547.461
t values	[2.42668]*	[0.88547]	[-0.75637]	[1.66368]	[1.64467]
R-squared	0.363794	0.752163	0.490428	0.763146	0.705587
F-statistic	1.000683	5.311106	1.684256	5.638531	4.194030
Akaike AIC	3.091830	2.183306	-3.653747	21.49110	21.91889
Schwarz SC	3.536154	2.627629	-3.209423	21.93542	22.36321

n=23 (after adjustment), *=significant at 5% level, d=first difference, EC=Error Correction term

Source-Calculated by author.

The estimated three cointegrating equations which were obtained from the system equations of the VECM are given below. All the three cointegrating equations are convergent but insignificantly tending towards equilibrium. The first cointegrating equation implies that the Asian export share has long run significant causalities with SAARC and ASEAN export shares to GCC respectively where the speed of adjustment is 42.7% per year. The second cointegrating equation also moves towards equilibrium insignificantly and its speed of adjustment is 63.7% per year. The equation states that the intra export share of GCC has long run causalities with SAARC and ASEAN export shares to GCC where the former is significant and the latter is insignificant. The third cointegrating equation is also approaching towards equilibrium insignificantly where the speed of adjustment was found as 2158% per year. The equation implies that the export concentration index of GCC has significant long run causalities with SAARC and ASEAN export shares to GCC respectively. The causality is negative with ASEAN but positive with SAARC in the first two equations and opposite in the third case.

$$Z_{1t-1} = -0.427XA_{t-1} - 0.000436GAX_{t-1} + 0.00017GSX_{t-1} - 22.988 \quad (6)$$

(-1.32) (-6.24)* (3.63)*

$$Z_{2t-1} = -0.637 IX_{t-1} - 9.4019e^{-05}GAX_{t-1} + 3.071e^{-05}GSX_{t-1} - 4.361 \quad (7)$$

(-1.186) (-2.18)* (1.03)

$$Z_{3t-1} = -21.581 XCI_{t-1} + 1.1246e^{-05}GAX_{t-1} - 5.585e^{-06}GSX_{t-1} - 0.769 \quad (8)$$

(-1.835) (4.18)* (-3.009)*

*=significant at 5% level. Z_{it-1}=cointegrating relation, i=1,2,...,n

The three cointegrating equations are shown in Figure 1 below.

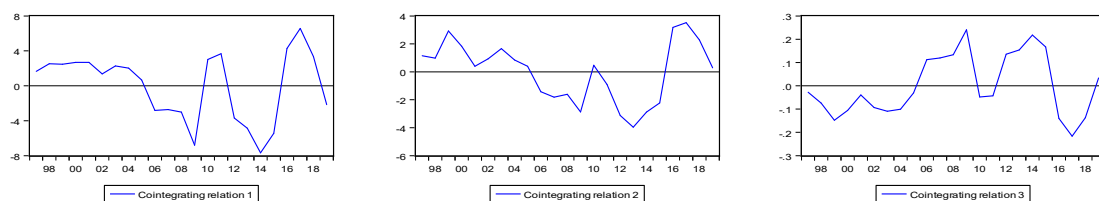


Figure 1. The Cointegrating equations

Source: Plotted by author.

The Wald test from the estimated system equations confirmed that there are short run causalities from export concentration index of GCC to intra export share of GCC, export share of ASEAN and SAARC with GCC respectively. There is short run causality from ASEAN export share with GCC to export share of Asia and from intra export share of GCC to export share of ASEAN with GCC. The short run causalities among those variables have been tabulated below.

Table 3. The Short run causalities

Short run causalities from.... To.....	Values of Chi-Square (1)	H0= no causality	Values of probability	No Causality accepted/rejected
From ASEAN export share with GCC to export share of Asia	5.529	H0= no causality	5.529	rejected
From export concentration index of GCC to intra export share of GCC	7.933	H0= no causality	0.0043	rejected
From intra export share of GCC to export share of ASEAN with GCC	7.727	H0= no causality	0.0054	rejected
From export concentration index of GCC to export share of ASEAN with GCC	7.616	H0= no causality	0.0058	rejected
From export concentration index of GCC to export share SAARC with GCC	3.801	Ho=no causality	0.0512	rejected

Source: Tabulated by author.

This VECM is nonstationary because there are two roots whose values are unity. The values of roots have been tabulated below.

Table 4. Values of roots

Roots	Modulus
1.000000	1.000000
1.000000	1.000000
-0.785936	0.785936
0.393995 - 0.639225i	0.750893
0.393995 + 0.639225i	0.750893
0.596409 - 0.071245i	0.600649
0.596409 + 0.071245i	0.600649
-0.098989 - 0.574688i	0.583151
-0.098989 + 0.574688i	0.583151
-0.581712	0.581712

Source: Calculated by author.

Moreover, the VECM is stable because all the roots lie on or inside the unit circle which is plotted in Figure 2.

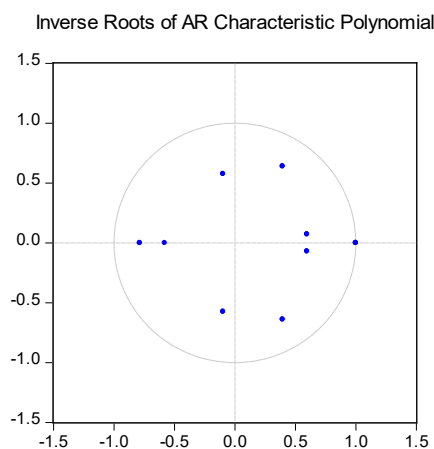


Figure 2. Unit circle.

Source: Plotted by author.

The impact of any shock to the respective variables measured by Cholesky one standard deviation innovations have been shown by the Impulse Response Functions whose explanations are given in the following Table 5.

Table 5. Analysis of Impulse Response Functions

Responses of to	Reached equilibrium atyears	Then moves convergent/divergent
Response of export share of Asia to intra export share of GCC	Not reached any time	Divergent
Response of export share of Asia to export concentration index of GCC	Not reached any time	Divergent
Response of export share of Asia to export share ASEAN with GCC	3 years	divergent
Response of export share of Asia to export share of SAARC with GCC	Not reached any time	divergent
Response of intra export share of GCC to export share ASEAN with GCC	4years	Divergent
Response of intra export share of GCC to export concentration index of GCC	3,5,8 years	Divergent
Response of intra export share of GCC to export share ASEAN with GCC	6,10 years	Divergent
Response of intra export share of GCC to export share SAARC with GCC	5 years	divergent
Response of export concentration index of GCC to export share of Asia	2 years	divergent
Response of export concentration index of GCC to intra export share of GCC	Not reached any time	divergent
Response of export concentration index of GCC to export share ASEAN with GCC	7 years	convergent
Response of export concentration index of GCC to export share SAARC with GCC	8 years	convergent
Response of export share ASEAN with GCC to export share of Asia	7 years	divergent
Response of export share ASEAN with GCC to intra export share of GCC	Not reached any time	divergent
Response of export share ASEAN with GCC to export concentration index of GCC	5 years	divergent
Response of export share ASEAN with GCC to export share SAARC with GCC	Not reached any time	divergent
Response of export share SAARC with GCC to export share of Asia	7,8 years	divergent
Response of export share SAARC with GCC to intra export share of GCC	Not reached any time	divergent
Response of export share SAARC with GCC to export concentration index of GCC	Not reached any time	divergent
Response of export share SAARC with GCC to export share ASEAN with GCC	Not reached any time	divergent

Source: Prepared by author.

All these shocks have been exposed in the Figure 3.

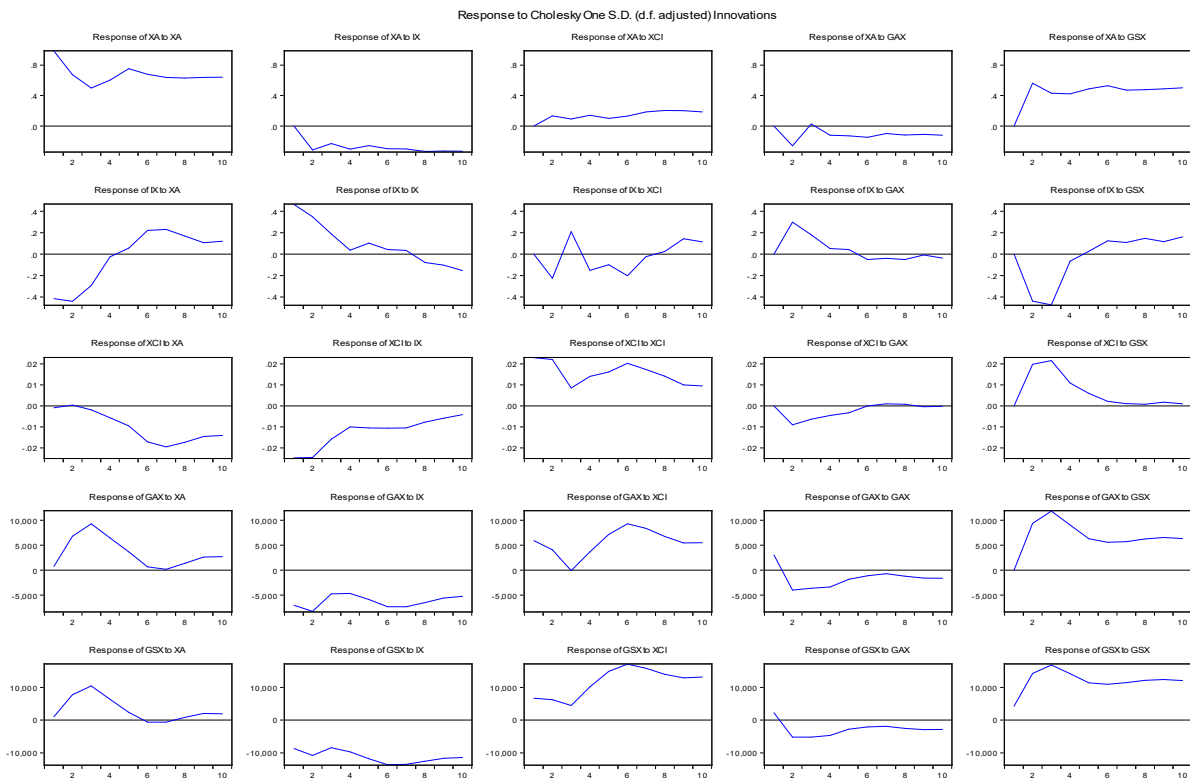


Figure 3. Impulse Response Functions

Source: Plotted by author.

Johansen unrestricted cointegration rank test in linear deterministic trend among first difference series of import share of Asia, intra-import share of GCC, import concentration index of GCC, export share of SAARC and ASEAN with GCC during 1995 -2019 revealed that Trace and Max Eigen statistic showed three cointegrating equations among them which are significant. It implies that the variables are associated in the long run i.e., Asian import share is influenced by the intra import and inter trade of GCC with ASEAN and SAARC in the long run. The values of Trace statistic, Max Eigen statistic, Critical Value and their probabilities have been given in the Table 6.

Table 6. Johansen Cointegration test

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Probability**
None *	0.830930	106.6624	69.81889	0.0000
At most 1 *	0.725246	65.78122	47.85613	0.0005
At most 2 *	0.620734	36.06798	29.79707	0.0083
At most 3	0.376510	13.76907	15.49471	0.0895
At most 4	0.118590	2.903337	3.841466	0.0884
		Max-Eigen Statistic		
None *	0.830930	40.88115	33.87687	0.0062
At most 1 *	0.725246	29.71324	27.58434	0.0262
At most 2 *	0.620734	22.29891	21.13162	0.0341
At most 3	0.376510	10.86573	14.26460	0.1610
At most 4	0.118590	2.903337	3.841466	0.0884

* denotes rejection of the hypothesis at the 0.05 level, **MacKinnon-Haug-Michelis (1999) p-values, n=23(after adjustment).

Source: Calculated by author.

The estimated first equation states that the change of the import share of Asia is insignificantly negatively affected by incremental intra import share of GCC and incremental import share of SAARC with GCC of the previous period, and significantly negatively related with import concentration index of GCC of the previous period and insignificantly positively influenced by incremental import share of ASEAN with GCC of the previous period respectively. The values of R^2 and F are high. The first two error correction terms are converging insignificantly and the third error term is significantly diverging. The estimated third equation states that the incremental intra import share of GCC is significantly negatively related with incremental import concentration index of GCC, and incremental import share of SAARC with GCC of earlier period. It is also significantly positively related with incremental import share of GCC and insignificantly positively related with import share of ASEAN with GCC of the previous period. Here both R^2 and F are high. The first Error correction and third error correction are divergent where the first is insignificant and the third is significant. The second error correction term is convergent and significant. The third estimated equation implies that the incremental import concentration index of GCC is insignificantly affected by incremental intra import share of GCC, import share of ASEAN and SAARC with GCC of previous periods respectively and insignificantly positively related with incremental import share of Asia of the previous period. Here R^2 and F are high. The first error correction term is divergent and significant, second error correction term is divergent and insignificant and the third error correction term is convergent and significant. The estimated fourth equation states that the incremental import share of ASEAN with GCC is insignificantly negatively related with incremental import share of Asia, intra import share of GCC, import concentration index of GCC and import share of SAARC with GCC of earlier periods respectively. Here R^2 and F are high. The first and second error correction terms are divergent and insignificant but the third error correction term is convergent and insignificant. The estimated fourth equation implies that the incremental import share of SAARC with GCC is negatively influenced by incremental intra import share of GCC and import concentration index of GCC of earlier periods both of which are insignificant. It is positively related with import share of Asia and import share of ASEAN with GCC of the previous period respectively. All of them are insignificant. Here R^2 and F are low. The first and second error correction terms are divergent and insignificant and third one is convergent and insignificant.

Table 7. The estimated VECM

	dIA _t	dIM _t	dCI _t	dGAM _t	dGSM _t
EC1	-0.128165	0.081739	0.001210	7.169111	252.6360
t values	[-1.61125]	[1.32007]	[3.05133]	[0.03626]	[0.69684]
EC2	-0.570733	-1.395237	0.002901	941.7710	2.557986
t values	[-1.61515]	[-5.07225]*	[1.64673]	[1.07230]	[0.00159]
EC3	146.4005	166.9133	-0.734477	-12702.91	-40090.33
t values	[3.27669]*	[4.79906]*	[-3.29787]*	[-0.11439]	[-0.19687]
dIA _{t-1}	0.256579	0.386814	0.000157	-439.8473	817.7822
t values	[1.44015]	[2.78908]*	[0.17690]	[-0.99330]	[1.00709]
dIM _{t-1}	-0.053134	0.239366	-0.001971	-207.1812	-1260.243
t values	[-0.23179]	[1.34142]	[-1.72506]	[-0.36364]	[-1.20623]
dCI _{t-1}	-198.9101	-99.48993	-0.046565	-88015.13	-106310.6
t values	[-4.62275]*	[-2.97026]*	[-0.21710]	[-0.82298]	[-0.54208]
dGAM _{t-1}	9.84E-05	0.000140	-1.51E-07	0.454661	0.313026
t values	[1.04114]	[1.89844]	[-0.32021]	[1.93638]	[0.72700]
dGSM _{t-1}	-1.02E-05	-0.000134	-4.99E-07	-0.333793	-0.068797

Table 7 (cont). The estimated VECM

t values	[-0.13926]	[-2.34133]*	[-1.36158]	[-1.82830]	[-0.20549]
C	0.441492	0.125657	0.002765	1515.902	1468.955
t values	[1.92808]	[0.70496]	[2.42252]*	[2.66357]*	[1.40752]
R-squared	0.727350	0.773915	0.633249	0.669747	0.335206
F-statistic	4.668477	5.990459	3.021633	3.548974	0.882396
Akaike AIC	2.763923	2.263006	-7.838852	18.40036	19.61311
Schwarz SC	3.208247	2.707330	-7.394528	18.84468	20.05744

n=23(after adjustment), EC=Error Correction term, d= first difference, *=significant at 5% level. Source: Calculated by author.

The estimated three cointegrating equations are shown below:

$$Z_{1t-1} = -0.128IA_{t-1} - 0.00293GAM_{t-1} + 0.001579GSM_{t-1} - 19.474 \quad (9)$$

(-1.61) (-5.13)* (4.22)*

$$Z_{2t-1} = -1.395 IM_{t-1} - 0.000984GAM_{t-1} + 0.000612GSM_{t-1} - 8.710 \quad (10)$$

(-5.07)* (-5.58)* (5.31)*

$$Z_{3t-1} = -0.7344 ICI_{t-1} - 8.195e^{-06}GAM_{t-1} + 4.8519e^{-06}GSM_{t-1} - 0.0515 \quad (11)$$

(-3.29)* (5.98)* (5.42)*

*=significant at 5% level

The estimated first cointegrating equation implies that the import share of Asia has long run causalities with the import shares of ASEAN and SAARC with GCC respectively where both are significant but the cointegrating equation has been approaching towards equilibrium insignificant in which the speed of adjustment is found as 12.8% per year. The second cointegrating equation states that the intra import share of GCC has long run causalities with the import shares of ASEAN and SAARC with GCC respectively where both are significant but the cointegrating equation has been converging and reached towards equilibrium significantly. The speed of adjustment is seen as 139.5% per year. The third cointegrating equation implies that the import concentration index of GCC has long run causalities with the import shares of ASEAN and SAARC with GCC respectively where both are significant and the equation has been converging significantly where the speed of adjustment is 73.44% per year. In Figure 4, the three equations have been depicted neatly. The causality with import share of ASEAN with GCC is negative and is positive with SAARC.

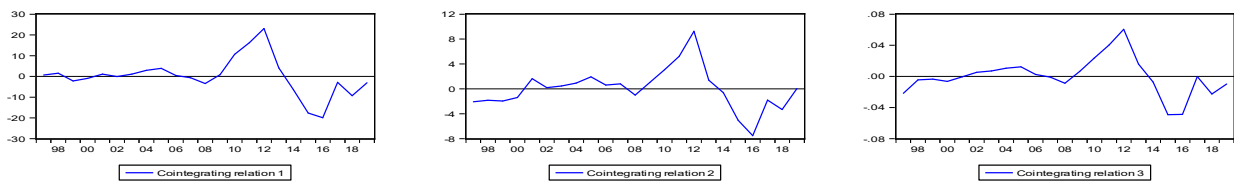


Figure 4. The Cointegrating relations

Source: Plotted by author

The Wald test of the estimated system equation of VECM revealed that the intra import share of GCC has short run causalities with import share of Asia, import concentration index of GCC and import share of ASEAN with GCC respectively. The import concentration index has short run causality with the import share of Asia. The import share of SAARC with GCC has short run causality with import share of ASEAN with GCC. These short run causalities have been arranged in the Table 8.

Table 8. The Short run causalities

Short run causalities from.... To.....	Values of Chi-Square (1)	H0= no causality	Values of probability	No accepted/rejected Causality
Import concentration index of GCC to import share of Asia	21.369	H0= no causality	0.0000	rejected
Import share of Asia to intra import share of GCC	7.778	H0= no causality	0.0053	rejected
Import concentration index of GCC to intra import share of GCC	8.8224	H0= no causality	0.0030	rejected
Import share of ASEAN with GCC to intra import share of GCC	3.604	H0= no causality	0.0576	rejected
Import share of SAARC with GCC to intra import share of GCC	5.481	Ho=no causality	0.0192	rejected
Import share of SAARC with GCC to import share of ASEAN with GCC	3.342	H0=no causality	0.067	rejected

Source: Tabulated by author.

There are two roots in the estimated VECM which are equal to unity so that the model is non-stationary. The values of all roots are given in the Table 9.

Table 9. Values of Roots

roots	modulus
1.000000	1.000000
1.000000	1.000000
0.004500 - 0.831651i	0.831663
0.004500 + 0.831651i	0.831663
0.719729	0.719729
0.378617 - 0.587522i	0.698951
0.378617 + 0.587522i	0.698951
-0.546672 - 0.365561i	0.657636
-0.546672 + 0.365561i	0.657636
0.546950	0.546950

Source- Calculated by author.

All the roots lie on or inside the unit circle for which it is a stable model. The unit circle and roots are plotted in Figure 5.

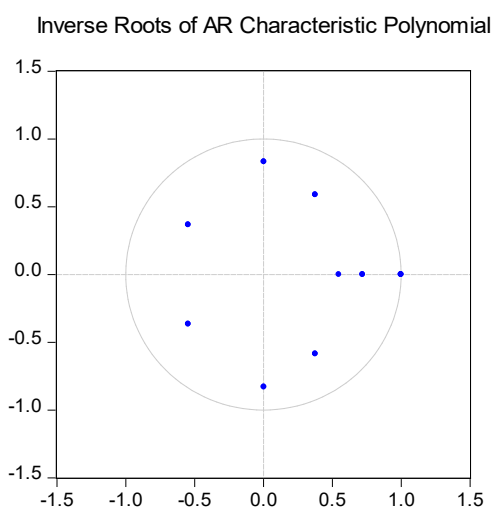


Figure 5. Unit circle

Source: Plotted by author.

The impulse response functions measured by Cholesky one standard deviation innovation from any shock to the respective variables have been described below in a tabulated form and is given below in Table 10.

Table 10. Analytics of Impulse Response Functions

Responses of to	Reached equilibrium atyears	Then moves convergent/divergent
Response of import share of Asia to intra import share of GCC	Not reached equilibrium any time	Divergent
Response of import share of Asia to import concentration of GCC	Not reached equilibrium any time	Divergent
Response of import share of Asia to import share of ASEAN with GCC	3,5,9 years	divergent
Response of import share of Asia to import share of SAARC with GCC	Not reached equilibrium any time	divergent
Response of intra import share of GCC to import share of Asia	Not reached equilibrium any time	Divergent
Response of intra import share of GCC to import concentration of GCC	5.5 years	Divergent
Response of intra import share of GCC to import share of ASEAN with GCC	Not reached equilibrium any time	Divergent
Response of intra import share of GCC to import share of SAARC with GCC	3,4,5 years	divergent
Response of import concentration index of GCC to import share of Asia	Not reached equilibrium any time	divergent
Response of import concentration index of GCC to intra import share of GCC	3.7 years	divergent
Response of import concentration index of GCC to import share of ASEAN with GCC	Not reached equilibrium any time	divergent
Response of import concentration index of GCC to import share of SAARC with GCC	3.5 years	divergent
Response of import share of ASEAN with GCC to import share of Asia	3 years	divergent
Response of import share of ASEAN with GCC to intra import share of GCC	4 years	divergent
Response of import share of ASEAN with GCC to import concentration index of GCC	2 years	divergent

Table 10 (cont). Analytics of Impulse Response Functions

Response of import share of ASEAN with GCC to import share of SAARC with GCC	Not reached equilibrium any time	divergent
Response of import share of SAARC with GCC to import share of Asia	Not reached equilibrium any time	divergent
Response of import share of SAARC with GCC to intra import share of GCC	2 years	divergent
Response of import share of SAARC with GCC to import concentration index of GCC	Not reached equilibrium any time	divergent
Response of import share of SAARC with GCC to import share of ASEAN with GCC	Not reached equilibrium any time	divergent

Source: Tabulated by author.

All the responses from the shocks to the variables are plotted in the impulse response functions in Figure 6.

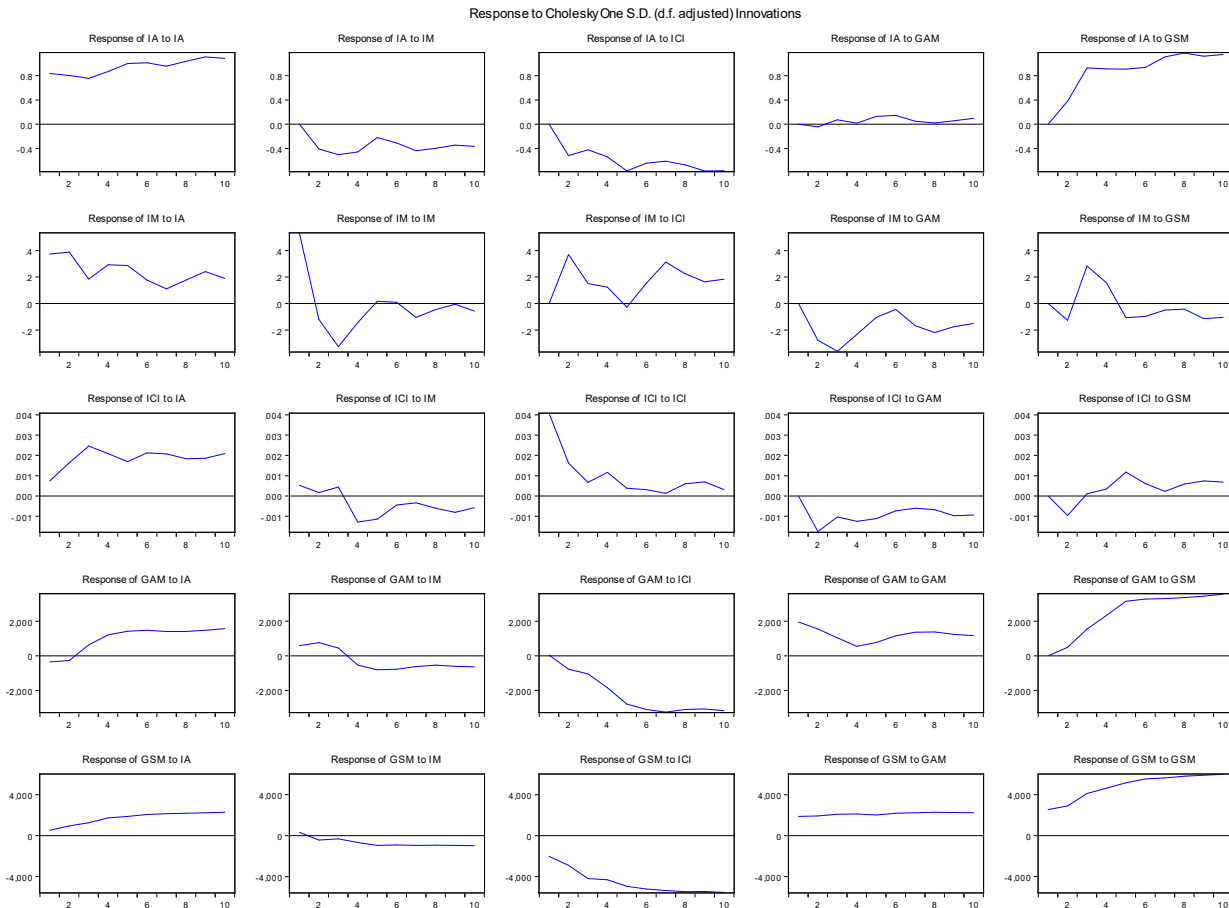


Figure 6. The Impulse Response Functions.

Source: Plotted by author.

2. Impact of GCC on Asian regional development

Johansen unrestricted cointegration rank test among the first difference series of Asian GDP, sum of intra export and import shares of GCC, sum of export and import shares of ASEAN with GCC, and sum of export and import shares of SAARC with GCC during 1995-2019 revealed that there is one cointegrating equation in Trace statistic only which is shown in the Table 11 which implies that the variables have long run association among themselves i.e., Asian GDP is influenced by the intra trade of GCC and inter trade of GCC with SAARC and ASEAN in the long run.

Table 11. Results of cointegration test

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Probability**
None *	0.632322	49.86991	47.85613	0.0319
At most 1	0.499734	26.85730	29.79707	0.1052
At most 2	0.283448	10.92716	15.49471	0.2160
At most 3	0.132196	3.261152	3.841466	0.0709
		Max-Eigen Statistic		
None	0.632322	23.01261	27.58434	0.1729

Table 11 (cont.). Results of cointegration test

At most 1	0.499734	15.93014	21.13162	0.2290
At most 2	0.283448	7.666010	14.26460	0.4137
At most 3	0.132196	3.261152	3.841466	0.0709

* denotes rejection of the hypothesis at the 0.05 level, **MacKinnon-Haug-Michelis (1999) p-values, N=23 (after adjustment).

Source: Calculated by author.

The estimated VECM is given below. The first estimated equation of VECM states that the incremental GDP of Asia is insignificantly positively related with the incremental sum of intra export and import shares of GCC and the incremental sum of export and import shares of SAARC with GCC and significantly negatively related with the incremental sum of export and import shares of ASEAN with GCC of the previous periods. Here R² and F are high. The error correction term is insignificant but convergent. The estimated second equation implies that the change of sum of intra export and import shares of GCC are significantly negatively related with the incremental sum of export and import shares of SAARC with GCC of the earlier period and are significantly positively influenced by the incremental sum of export and import shares of ASEAN with GCC of the previous periods and is insignificantly positively related with incremental GDP of Asia of the previous period. The values of R² and F are quite high. The error correction term is divergent and significant. The estimated third equation states that the incremental sum of export and import shares of ASEAN with GCC is insignificantly negatively related with the incremental sum of intra export and import shares of GCC of earlier period and is insignificantly positively related with the incremental GDP share of Asia of previous period. Here R² and F are low. The error correction term is divergent and insignificant. The estimated fourth equation of VECM implies that the change of sum of export and import shares of SAARC with GCC is insignificantly negatively affected by the changes of intra export and import shares of GCC of earlier period and the incremental sum of export and import shares of ASEAN with GCC of the previous period respectively and is insignificantly positively influenced by the change of GDP of Asia of the previous period. In this case the values of R² and F are quite high.

Table 12. The Estimated VECM

	d(GDPA) _t	d(IX+IM) _t	d(GAM+GAX) _t	d(GSM+GSX) _t
EC	-0.001448	2.76E-06	0.042098	0.024749
t values	[-0.96450]	[2.57424]*	[1.52873]	[0.80561]
d(GDPA _{t-1})	0.798370	0.000378	4.431054	4.518884
t values	[2.83044]*	[1.87456]	[0.85619]	[0.78269]
d(IX _{t-1} +IM _{t-1})	64.08097	-0.653371	-870.2411	-2406.961
t values	[0.33888]	[-4.83869]*	[-0.25083]	[-0.62187]
d(GAM _{t-1} +GAX _{t-1})	-0.098756	9.70E-05	-0.305114	-1.166691
t values	[-2.53232]*	[3.48334]*	[-0.42641]	[-1.46157]
d(GSM _{t-1} +GSX _{t-1})	0.058127	-0.000106	0.242159	0.962519
t values	[1.52694]	[-3.88840]*	[0.34671]	[1.23529]
C	422.7615	0.336717	-311.7355	1648.960
t values	[1.43785]	[1.60371]	[-0.05779]	[0.27399]
R-squared	0.541132	0.708524	0.299875	0.354470
F-statistic	4.009531	8.264757	1.456276	1.866990
Akaike AIC	16.68388	2.194892	22.50292	22.72167
Schwarz SC	16.98010	2.491108	22.79914	23.01789

n=23 (after adjustment), *=significant at 5% level, EC=error correction term, d=first difference.

Source: Calculated by author.

The estimated cointegrating equation is as follows:

$$Z_{t-1} = -0.001448 \text{GDPA}_{t-1} - 57724.67(\text{IX}_{t-1} + \text{IM}_{t-1}) - 15.827(\text{GAM}_{t-1} + \text{GAX}_{t-1}) + 10.91(\text{GSM}_{t-1} + \text{GSX}_{t-1}) \quad (12)$$

[-0.964]
[-2.560]*
[-3.911]*
[3.981]*

+ 1219108.33006

The cointegrating equation has been approaching towards equilibrium with the speed of adjustment of 0.1448% per year which is insignificant. It implies that the GDP of Asia has long run causalities with the sum of intra export and import shares of GCC, the sum of export and import shares of ASEAN with GCC and the sum of export and import shares of SAARC with GCC where causal relations are significant. The first and second causal relations are negative and the third one is positive.

It is clearly seen in the Figure 7.

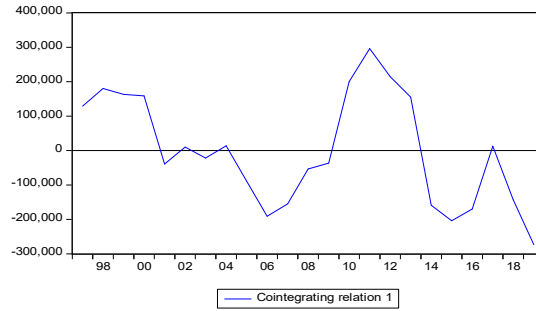


Figure 7. The Cointegrating equation

Source: Plotted by author.

The Wald test of the estimated system equations of the estimated VECM revealed that there is a short run causality from sum of export and import shares of ASEAN shares with GCC to the GDP of Asia and there are short run causalities from the sum of export and import shares of ASEAN and SAARC shares with GCC to sum of intra export and import shares of GCC during 1995-2019. In Table 13, the causalities are noted briefly.

Table 13. The Short run causalities

Short run causalities from.... To.....	Values of Chi-Square (1)	H0= no causality	Values of probability	No Causality accepted/rejected	Causal relation
From sum of export and import shares of ASEAN shares with GCC to the GDP of Asia	6.412630	H0= no causality	0.0113	rejected	negative
From sum of export and import shares of ASEAN share with GCC to sum of intra export and import shares of GCC	12.13364	H0= no causality	0.0005	rejected	positive
From sum of export and import shares of SAARC share with GCC to sum of intra export and import shares of GCC	15.11967	H0= no causality	0.0001	rejected	negative

Source: Calculated by author.

In this VECM, there are three roots whose values are one that's why the model is non-stationary. In Table 14 the values of roots are given.

Table 14. The values of Roots

Root	Modulus
1.000000	1.000000
1.000000	1.000000
1.000000	1.000000
-0.858510	0.858510
0.838188	0.838188
0.506261 - 0.506195i	0.715915
0.506261 + 0.506195i	0.715915
0.253390	0.253390

Source: Calculated by author.

The VECM model is stable because all the roots lie on or inside the unit circle which are shown in the Figure 8.

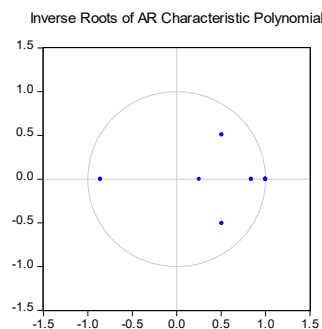


Figure 8. The Unit circle

Source: Plotted by author

The impulse response functions revealed that the response of GDPA to ASEAN trade reached equilibrium in the seven and eight years and then moved divergent and the response of GDPA to SAARC trade reached equilibrium at first year and 3.8 years and then tended divergent. The response of the sum of the intra export and import shares of GCC reached equilibrium after 5.5 and 6.5 years and then moved away from equilibrium. The other responses did not reach to equilibrium at any time in courses of divergence. These impacts are shown in the Figure 9.

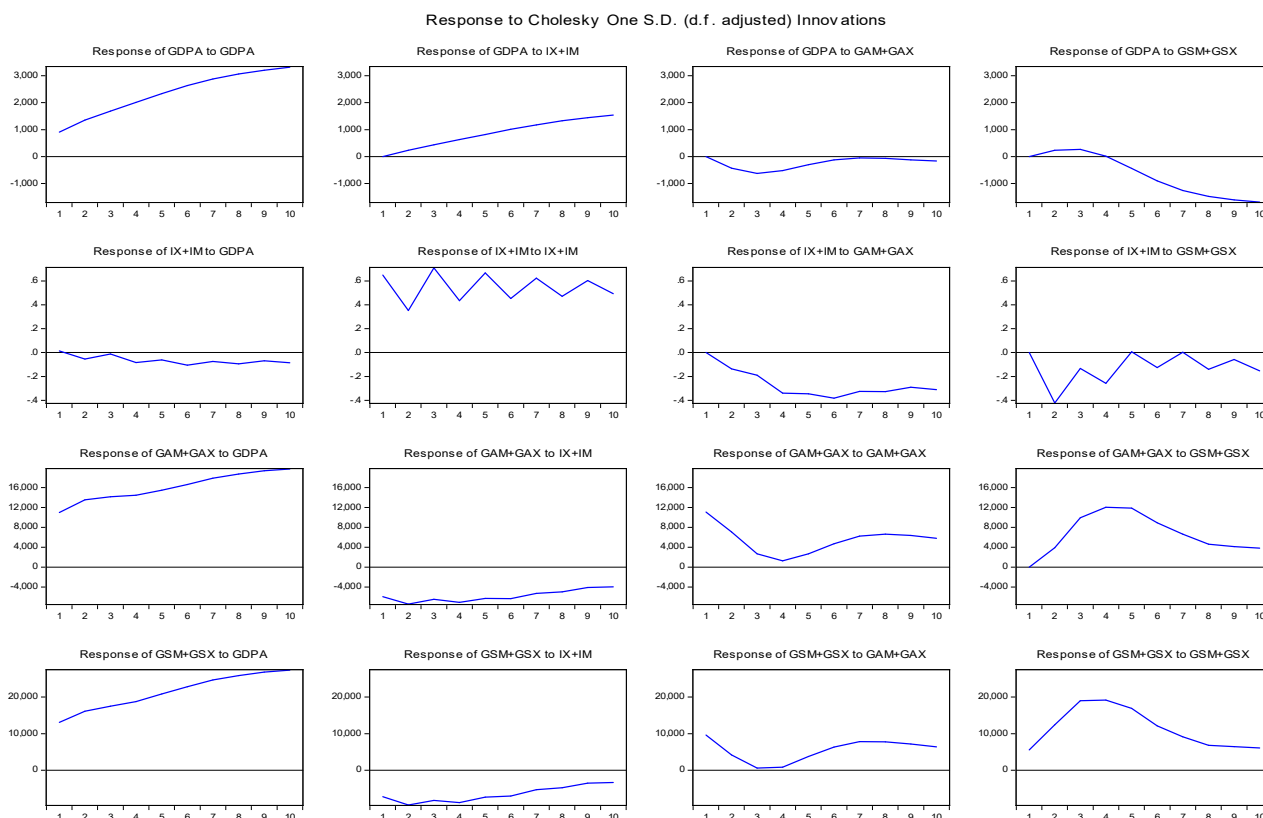


Figure 9. The Impulse Response Functions.

Source: Plotted by author.

Not but the least, it is noted that the correlation matrix implied that the correlations between GDP of Asia and the sum of the intra export and import shares of GCC, the sum of the export and import shares of ASEAN and SAARC with GCC are found positive that justified that the GCC has great influence on the economic integration process of Asia. With the obvious reasons, the correlation coefficients among sum of intra exports and imports of GCC with the sum of exports and imports of GCC with SAARC and ASEAN were found negative. The correlation matrix is given below.

The Correlation matrix of VECM

	GDPA	IX+IM	GAM+GAX	GSM+GSX	
GDPA	1	0.0203	0.6583	0.7019	
IX+IM	0.0203	1	-0.3398	-0.3736	
GAM+GAX	0.6583	-0.3398	1	0.9427	
GSM+GSX	0.7019	-0.3736	0.9427	1	(13)

Some limitations and scope of future research

The paper has some limitations too. The impact of monetary and financial integration of GCC with SAARC and ASEAN in the process of Asian regional integration was excluded in the analysis due to lack of most influential time series financial and monetary indicators. This important area is left for future research which will be a significant extended analysis of the paper. Since, the possible policies that can accelerate the economic integration process of Asian region are debatable and belong to the political dimensions then the paper excludes

that part. The GCC-East Asia integration is also excluded here due to non-availability of data and low integration status.

Conclusion

The influence and functions of GCC on the progress of Asian Economic Integration in association with SAARC and ASEAN are to be explored because it can also integrate East, South and West Asia as well. How East Asian monetary integration can be integrated with common currency framework of GCC in course of monetary and financial integration in Asian bloc is a phenomenon of research which can claim novelty. Yet, the paper concludes that the export share of Asia has long run association with intra export share of GCC, export concentration index of GCC, export shares of SAARC and ASEAN with GCC showing three cointegrating equations. The export share of Asia has long run causalities with export shares of SAARC and ASEAN with GCC which is significantly approaching towards equilibrium with speed of adjustment of 42% and the intra export share of GCC has long run causalities with export shares of SAARC and ASEAN with GCC which is significantly approaching towards equilibrium with the speed of adjustment of 63.7% per year. The export concentration index has short run causalities with export of ASEAN and SAARC with GCC, the intra export share of GCC and the export share of GCC has short run causality with the export share of ASEAN with GCC. The import share of Asia showed three cointegrating equations where import concentration index and the intra import share of GCC have significant long run causalities from import shares of SAARC and ASEAN with GCC which are approaching towards equilibrium significantly but the import share of Asia has insignificant long run causalities with them. The intra import share of GCC has short run causalities with the Import share of Asia, Import concentration index of GCC and the import share of ASEAN with GCC respectively. The import concentration index has short run causality with the import share of Asia. The import share of SAARC with GCC has short run causality with the import share of ASEAN with GCC. All of these findings revealed that the Gulf Cooperation Council affected the process of economic integration of Asia. The GDP of Asia has long run causalities with the sum of the intra export and import shares of GCC, the sum of the export and import shares of ASEAN with GCC and the sum of the export and import shares of SAARC with GCC where causal relations are significant. There is a short run causality from sum of the export and import shares of ASEAN shares with GCC to the GDP of Asia and there are short run causalities from the sum of the export and import shares of ASEAN and SAARC shares with GCC to the sum of the intra export and import shares of GCC respectively during 1995-2019. These observations imply that economic integration of GCC has quite influence on the development process of Asia.

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Appendix

Data used in this paper

IX=Intra export share of GCC (% of bloc), IM=Intra import share of GCC (% of bloc), XCI=export concentration index of GCC, ICI=Import concentration index of GCC, GAM=Import of GCC from ASEAN (in million US\$), GAX=export of GCC from ASEAN (in million US\$), GSM=import of GCC from SAARC (in million US\$), GSX=export of GCC from SAARC (in million US\$), GDPA=GDP of Asia in billion US\$, XA=export share of Asia (% of world), IA=Import share of Asia (% of the world).

	GAM	GAX	GDPA	GSM	GSX	IA	ICI	IM	IX	XA	XCI
1995	4614	11648	9213	3004	7910	28.72	0.054	8.91	6.22	30.156	0.614
1996	5102	15581	8987	3832	9978	29.049	0.053	9.31	6.67	29.678	0.622
1997	4911	15034	8697	4366	10405	28.55	0.066	9.04	6.43	30.236	0.584
1998	4782	9731	7895	4371	7746	24.44	0.066	8.78	7.96	28.347	0.555
1999	4648	13927	8772	4353	11322	25.31	0.062	9.23	7.16	29.762	0.57
2000	4854	19535	9480	4676	12287	27.41	0.068	12.26	6.22	32.038	0.579
2001	5021	17874	8883	4735	10079	26.66	0.075	10.95	6.67	30.378	0.531
2002	5266	18249	9101	5518	11219	27.29	0.075	10.98	7.39	31.252	0.517
2003	5977	21496	10046	7641	14121	27.86	0.074	10.85	6.79	31.895	0.506
2004	7906	29892	11333	11060	21056	29.07	0.075	11.64	6.92	32.995	0.52
2005	10347	43847	12371	12959	29107	29.86	0.076	11.57	6.17	34.184	0.551
2006	12499	51988	13409	16071	45586	30.116	0.075	11.98	6.03	34.931	0.559
2007	16691	59408	15297	21966	61060	30.33	0.073	10.68	6.47	35.158	0.576
2008	22164	81688	17653	33914	90699	31.799	0.075	10.77	6.38	35.881	0.598
2009	19563	50983	17924	34507	65419	33.067	0.068	9.91	7.61	36.749	0.513
2010	20435	64409	20931	38231	90217	35.367	0.074	10.64	6.74	38.917	0.506
2011	24304	99141	24258	49116	132309	36.342	0.073	11.8	6.49	39.316	0.529
2012	30948	109436	25713	48647	144962	37.589	0.085	10.77	6.23	40.422	0.502
2013	35836	117313	26150	50890	148915	37.966	0.091	12.19	7.93	40.327	0.5
2014	38389	106456	26977	48601	132833	37.76	0.081	11.66	8.06	40.651	0.481
2015	38526	68771	26639	47680	89950	37.37	0.087	9.89	11.24	41.473	0.358
2016	31496	59029	27618	45840	82030	36.73	0.087	9.83	10.91	40.913	0.347
2017	31895	72922	29559	41902	96952	37.659	0.087	11.11	10.52	41.111	0.354
2018	30376	91150	31814	42793	111425	37.97	0.083	12.45	9.8	41.019	0.4
2019	31045	79003	35145	42965	108887	37.747	0.086	12.01	10.66	40.875	0.393

Source: UNCTAD (www.unctad.org).