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Global financial crisis 2008 and its vulnerability in SAARC countries

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Abstract: The key objective of the study is to analyze the impact of global financial crisis on export in countries of SAARC region. For current empirical analysis, this study used a gravity model to investigate export of final goods from SAARC countries to high income countries during the period 2003 to 2014. The independent and dependent variables were used in the natural logarithm form of dummy variables. The geographical distance between capitals of trading partners and importer's and exporter's GDPs are used as standard independent variables. Consequently, this study includes their dummy variables demonstrating common official language, membership in regional trading agreements and financial crisis. Therefore, to examine the impact of last crisis, model comprises dummy variable (y_{2007} , y_{2008} , y_{2009} and y_{2010}) representing critical years of study. Moreover, this study also used random effect approach which required that at least one assumption should be fulfilled which is zero correlation of independent variables. The current study concluded that financial markets of SAARC countries remained less vulnerable to financial crisis or bad-loan crisis because of having less exposure to subprime assets and high capital to risk assets ratio. However, trade of goods and services of the SAARC countries with the developed economy resulted in negative effects on most of the SAARC countries. Moreover, the study also revealed that financial crisis had serious repercussion for the other countries of the SAARC region due to lack of appropriate response and that a timely response by countries could save the prolonged negative influence of financial crisis.

JEL Classifications: G01

Keywords: Financial crisis, GDP, gravity model, SAARC countries

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1. Introduction

The countries of the SAARC region were hit by global financial crisis which could be seen as a result of financial deregulatory policies in developed countries and due to the unpredictable increase in oil and food prices. However, its impact varies from one country to another. The economies of the region experienced slowdown in economic growth along with severity in other macroeconomic indicators like fall in foreign exchange reserves, increase of deficit in current account and depreciation currencies.

The forecasts of the global economies by the World Bank and the IMF have serious implications for the SAARC member countries because it poses risk to their economic growth. Actually, tight integration, in terms of open capital markets, export of various commodities, remittances by laborers of the regional countries with directly affected countries from the global financial crisis (GFC) pushed them in economic down turn. The region as a whole with more than 10% poor population faced this crisis with serious implications. It pushed many new individuals into poverty (Hapsoro & Suryanto, 2017; Ahmed, Al-Gasaymeh, & Mehmood, 2017). The governments of the regional countries faced serious constraints to make expenditures on poor population as well as on other vulnerable groups in various prospects of human resource development. The GFC has

made the situation even worse. A fall in the standards of living triggered the protectionism among the regional countries which hampered the process of regional integration, on one hand and the lack of combine efforts to bring the region out of the crisis on the other hand.

Such a financial crisis is considered as one of the noteworthy characteristics in the history of economics and studied on wide range. For instance, Cerra & Saxena (2010) and IMF (2009) originates that financial crisis is largely linked with rapid and consistent decrease in output level. Kaminsky & Reinhart (1999) found that banking sector insolvency in-fact originated from this crisis. Reinhart & Rogoff (2010) noticed that assets markets collapse, government debts and a consistent fall in output and employment debts and a consistent fall in output and employment are the basic reason of economic crisis (Ullah, Abrar-ul-haq, & Shah, 2016; Fahad, & Laura, 2017).

The SAARC countries are to a great degree assorted in their normal asset enrichment, size populace, economy, and additionally numerous different attributes. India is the biggest nation in all regards, and Pakistan is the second biggest as far as size. India possesses more than 70 for each penny of the landmass of the locale and its regional and sea limit touches all SAARC nations with the exception of Afghanistan (Murtaza, Ali & Abrar ul haq, 2016). Bhutan and Nepal are area bolted while Maldives and Sri Lanka are island states.

Typically, the nation's shaping a financial or political provincial coordination share a reasonable level of association and sincerity, yet SAARC nations regardless of having framed a local participation, have a few or the other pressure amongst them - fluctuating from regional debate to water sharing to certain more significant issues like ethnic or religious issues. All the SAARC nations have a provincial past and are not exceptionally stable politically, despite the fact that India is one of the biggest popular governments of the world. Every one of these nations has monetary issues like need, unemployment, wage disparity, provincial uneven characters subject to outside help.

These nations might be named as immature or evolving economies. World export of final goods declined around 14% (408.2 bln USD) in 2009 and it increased 12% (322.6 bln USD) in 2010. This represented that after reduction exports did not recuperate. Later on, it increased by 23% but still could not reach the value as it was in 2008. This shows that financial crisis had badly hit the exports. In 2009 a fall in exports was greater than the change in GDP. The fall in real and nominal GDP did not exceed more than 10%. Additionally, value of real and nominal GDP was higher than 2008.

Behind the macroeconomic statistics and various efforts of economic modeling, individuals from various sectors like farmers, manufacturing workers and migrant workers all over the world were asking the one same question: how the recent financial crisis had influenced the trade potential of the SAARC countries? Are the exports of SAARC countries diversified enough to dilute the impact of decrease in demand of high income countries? However, the literature is deficient on the questions at hand. Therefore, the key objective of the study is to analyze the impact of Global Financial crisis on export of countries of the SAARC region.

2. Literature review

Financial crisis is considered as one of noteworthy and unswerving topographies in economic background historically. For instance, financial crisis is largely linked with rapid and consistent decrease in output level (IMF, 2009; Cerra & Saxena, 2008). Banking sector

insolvency in-fact is the major cause to originate crises (Haseeb, Azam, Hassan & Hartani, 2014; Samad, 2014; Kaminsky & Reinhart, 1999). Reinhart & Rogoff (2010) noticed that assets markets collapse, government debts and a consistent fall in output and employment are the basic reason of economic crises.

If we look back the trend of trade and financial crisis, it helps a lot to understand the behavior of trade and to evaluate the impact of crisis. Prior literature has focused on the financial crisis and its influence on trade by looking into historical standpoint. Freund's (2009) results suggest that fall in world trade was almost five time bigger than the fall in world GDP. The downturn caused recently due to collapse of financial markets of the developed countries routed from America provided some interesting evidence, that is, countries having differences in trade patterns or the dynamics may have different impact of financial crisis. However, there was a systematic influence of crisis on the recovery process of the economies (Setyawati, Suroso, Suryanto, & Nurjannah, 2017; Laeven & Valencia, 2010). Baldwin & Forslid (2010) stated that trade should be diversified in a way that it should not only be composed of raw material and finished goods but it should also comprise two-way flow patterns of goods, services of human capital along with physical capital. The rapid globalization of supply chains has been witnessed during the last two decades (Antra, Chor, Fally, & Hillberry, 2012; Baldwin & Forslid 2010; Zhang, Fu & Xu, 2018). Globalization facilitates application of comparative and absolute advantages in diverse nations and countries.

Literature has adopted gravity models so that the impact of crisis on trade in the post crisis scenario can be captured appropriately. Cheng & Pike (2003) examined short-term effects after a crisis up to two years and concluded that bank crisis has a positive impact on imports while negative impact on exports. Berman & Martin (2010) developed a bilateral gravity model to examine economic crisis impact on trade. No one considered the area of SAARC countries and trading pattern of high income countries (Abidin, Haseeb, Azam, & Islam, 2015; Viswanathan & Maheswaran, 2017). Furthermore, the literature is also deficient of having a strong theoretically founded model to analyze the impact of financial crisis on South Asian economies. It is very important as imports are imprecise by tariffs and other protection trial, that is, because the value of imports were usually greater than value of exports due to protections and tariffs etc.

3. Methodology

In this connection, Clarete et al., (2002) used the gravity model to appraise the outcome of different preferential trading arrangements (PTAs) in the Asia-Pacific region. They used cross-section and panel data evaluation techniques. Šošić & Vujčić, (2005) discussed the level of trade integration within the southeast Europe (SEE) region by using trade openness ratio and trade concentration indices. Rehman (2003) also applied the gravity model by using panel data techniques. He estimated the impact of trade of Bangladesh and its trading partners.

For current empirical analysis, this study used gravity model to investigate export (Exp) of final goods from SAARC countries (i) to high income Countries (j) during the period of 2003 to 2014.

$$\ln X_{ij}^t = \beta_0 + \beta_1 \ln GDP_t^i + \beta_2 \ln(GDP_t^i + GDP_j^t) + \beta_4 \ln dist_{ijt} + \beta_5 lang_{ij} + \beta_6 RAT_{ijt} + \beta_7 f.crisis_{ijt}$$

where X_j^t - exports among SAARC and developed countries; GDP_i^t - Gross Domestic Product of SAARC countries; GDP_j^t - Gross Domestic Product of developed countries; $dist_{ij}$ - geographic distance between capitals of trading partners and importer's and exporter's GDPs; $lang_{ij}$ - common official language; RAT_{ij} - regional trading agreement; $f.crisis_{ijt}$ - financial crises.

Independent and dependent variables used in natural logarithm formed dummy variables. Geographic distance between capitals of trading partners and importer's and exporter's GDPs were used as standard independent variables. Consequently, this study included their dummy variables demonstrating common official language, membership in regional trading agreements and financial crisis. Therefore, to examine the impact of the last crisis, the model comprised dummy variable (y2007, y2008, y2009 and y2010) representing critical years of study. Moreover, this study used random effect approach because for this approach one of important assumptions should be fulfilled which is zero correlation of independent variables and in current analysis this assumption holds.

4. Estimations and results

This section presents country-wise estimation of gravity model and analysis. A complete Gravity model was augmented with dummy variables for financial crisis. Considering the fact that SAARC countries respond to financial crisis with time lag, the dummy variable had value 1 for years 2007 to 2010 and zero otherwise. Data captured the exports of every SAARC country with its trading partners for the period 2003 to 2014 therefore this study applied panel data for every country.

4.1. Gravity model for India

First gravity model for India with the cross section of export to trading partners was included for the time series data ranging for 2003 to 2014, when over total panel observations had become 204. The dependent variable was export of first panel country from SAARC region with the list of explanatory variables such as GDP of panel country, GDP of cross-sectional country, difference of per capita GDP of panel country, GDP of cross-sectional country, distance between panel and cross-sectional country and financial crisis.

For India, the estimated gravity model showed coefficient of intercept term which was statistically significant with the test statistic -4.16. Furthermore, its own GDP was positively associated with its exports and found statistically significant having coefficient value 0.36 which meant that 1% increase in its own GDP would lead to increase its export by 0.36%. The partner countries' GDP coefficient was also found statistically significant

and possessing positive association with India's export. Next, the difference of per capita GDP between India and its trading partner countries variable showed negative association with its exports and was found statistically significant. It showed that there was 0.59 percent decrease in India's export if there would be 1 percent increase in the difference. It meant that the access per-capita GDP of partner countries was deterioration of exports of India. Another important issue of increase in cost due to distance was tackled through the distance variables between panel countries and their trading partners by the gravity model. For India, it was found statistically significant that distance between India and its trading partner countries was negatively linked and exploiting its exports.

TABLE 1. RANDOM EFFECT MODEL FOR INDIA

VARIABLES	COEFFICIENT	STD. ERROR	T-STATISTIC	PROB.
C	-20.1139	4.8319	-4.1626	0.000
LGDP	0.3632	0.1146	3.1683	0.001
LRGDP	2.4288	0.4182	5.8066	0.000
DPGDP	-0.5946	0.2006	-2.9624	0.003
FCC	0.0656	0.1012	0.6483	0.517
LDIS	-0.5543	0.1921	-2.8846	0.004
R-Square	0.225			
Adjusted R ²	0.206			
F-statistic	11.534			
Durbin Watson	2.098			
Effects specification	S.D.	Rho		
Cross-section random	0.3262	0.2152		
Idiosyncratic random	0.6229	0.7848		

Finally, to see the financial impact over SAARC region, financial crises dummy variable was incorporated in the gravity model, and here it was found statistically insignificant. It meant that financial crisis did not trouble the exports of India significantly. Being largest regional economy, India suffered from the financial crisis though falling capital flows and the impact on stock markets. As a result of decreasing demand by the European and US economies after the financial crisis, exports of manufacturing sector such as gems, textile, leather and jewelry stocked badly. Before the start of financial crisis in October 2007, India was enjoying trade surplus with USA with 15% of its total exports.

4.2. Gravity model for Maldives

Next, the focus of analysis was the estimation results for Maldives. The estimated gravity model showed that coefficient of intercept terms was statistically insignificant. Furthermore, its own GDP positively associated with its exports and found statistically significant having coefficient value 2.08 meaning thereby 1% increase in its own GDP would lead to increase in its export by 2.08%. The partner counties GDP coefficient was also found statistically significant and possessing positive association with Maldives exports. The next factor was the difference of per capita GDP between Maldives and its

trading partner countries variable was showing negative association with its exports and was found statistically significant with coefficient value 1.68.

TABLE 2. RANDOM EFFECT MODEL FOR MALDIVES

VARIABLES	COEFFICIENT	STD. ERROR	T-STATISTIC	PROB.
<i>C</i>	-4.001	5.947	-0.672	0.502
<i>LGDP</i>	2.0877	0.289	7.220	0.000
<i>LRGDP</i>	0.8414	0.654	1.284	0.20
<i>DPGDP</i>	-1.6862	0.319	-5.320	0.000
<i>FCC</i>	-2.7356	0.345	-7.916	0.000
<i>LDIS</i>	-0.4731	0.137	-3.440	0.000
R-Square	0.502			
Adjusted R ²	0.488			
F-statistic	34.824			
Durbin Watson	1.469			
Effects specification	S.D.	Rho		
Cross-section random	0.597	0.371		
Idiosyncratic random	0.777	0.628		

Another important issue of increase in freight cost due to distance was tackled through the distance variable between panel countries and their trading partners in the gravity model. for Maldives, it was found to be statistically significant that distance between Maldives and its trading partner countries was negatively linked and exploiting its exports.

The distance variables was found statistically significant and with the increase in each kilometer in distance damaging Maldives exports by 2.75% between Maldives and its trading partners. Moreover, finally, to observe the financial impact over SAARC region it was formulated the financial crisis as dummy variable to troubling Maldives exports at alarming situation. The coefficient value is -0.47 that showed it diminishing exports of Maldives by 47% as Maldives entered into the financial crisis.

4.3. Gravity model for Nepal

The estimated gravity model for Nepal showed that coefficient of intercept term was statistically significant with the test statistics having value of 3.05. furthermore, its own GDP was positively associated with its exports and found statistically significant having coefficient value 0.83. Means 1% increase in its own GDP would lead to increase its export by 83%.

The partner countries GDP coefficient was also found statistically significant but possessing negative association with Nepal exports with coefficient value -4.18. Next the difference of per capita GDP between Nepal and its trading partner countries was showing negative association with Nepal's export having coefficient value -0.50.

TABLE 3. RANDOM EFFECT MODEL FOR NEPAL

VARIABLES	COEFFICIENT	STD. ERROR	T-STATISTIC	PROB.
C	46.269	15.122	3.059	0.002
LGDP	0.839	0.169	4.952	0.000
LRGDP	-4.184	1.485	-2.817	0.005
DPGDP	-0.503	0.197	-2.540	0.012
FCC	-0.966	0.125	-4.483	0.000
LDIS	-0.246	0.110	-2.224	0.028
R-Square	0.256			
Adjusted R ²	0.215			
F-statistic	6.651			
Durbin Watson	0.645			
Effects specification	S.D.	Rho		
Cross-section random	0.440	0.555		
Idiosyncratic random	0.394	0.444		

Another important issue of increase in cost due to distance was measured by distance variables between Nepal and its trading partners. However, a negative association and deterioration impact of Nepal's export was found. This result was statistically significant. Finally, to see the financial impact over SAARC region it was formulated the financial crisis dummy variable in the gravity model and here it was found negative relation with coefficient value -0.24 which showed that it was diminishing export of Nepal by 24% and this result was significant statically.

4.4. Gravity model for Pakistan

TABLE 4. RANDOM EFFECT MODEL FOR PAKISTAN

VARIABLES	COEFFICIENT	STD. ERROR	T-STATISTIC	PROB.
C	-3.440	1.840	-1.869	0.063
LGDP	0.699	0.163	4.279	0.000
LRGDP	0.576	0.168	3.416	0.000
DPGDP	0.760	0.193	3.981	0.000
FCC	-0.560	0.024	-2.901	0.004
LDIS	-0.020		-0.822	0.416
R-Square	0.357			
Adjusted R ²	0.341			
F-statistic	21.733			
Durbin Watson	0.999			
Effects specification	S.D.	Rho		
Cross-section random	0.782	0.964		
Idiosyncratic random	0.150	0.035		

The estimated gravity model for Pakistan showed that coefficient of intercept term was statistically significant with the test statistics having value of -1.89. Furthermore, its own GDP was positively associated with its exports and found statistically significant having coefficient value 0.69. It means that 1% increase in its own GDP would lead to increase its export by 69%. The partner countries GDP coefficient was also found statistically significant but possessing positive association with Pakistan exports with coefficient value 0.76. Next the difference of per capita GDP between Pakistan and its trading partner countries was showing positive association with Nepal's export having coefficient value -0.56.

Another important issue of increase in cost due to distance was measured by distance variables between Pakistan and its trading partners. However, it was found negative association and deterioration impact of Pakistan's export. This result was statistically significant. Finally, to see the financial impact over SAARC region it was formulated the financial crisis dummy variable in the gravity model and here it was found negative relation with coefficient value -0.02 which showed that it was diminishing export of Pakistan by 2% and this result was significant statically.

4.5. Gravity model for Sri Lanka

The estimated gravity model for Sri Lanka shows that coefficient of intercept term is statistically significant with the test statistics having value of -7.319. Furthermore, its own GDP was positively associated with its exports and found statistically significant having coefficient value 0.60. Means 1% increase in its own GDP would lead to increase its export by 60%. The partner countries GDP coefficient was also found statistically significant but possessing positive association with Sri Lanka exports with coefficient value 1.21. Next the difference of per capita GDP between Sri Lanka and its trading partner countries was showing positive association with Sri Lanka's export having coefficient value -0.49.

TABLE 5. RANDOM EFFECT MODEL FOR SRI LANKA

VARIABLES	COEFFICIENT	STD. ERROR	T-STATISTIC	PROB.
C	-7.319	2.130	-3.435	0.000
LGDP	0.607	0.146	4.143	0.000
LRGDP	1.218	0.202	6.023	0.000
DPGDP	-0.496	0.148	-3.346	0.001
FCC	-0.581	0.236	-2.462	0.014
LDIS	-0.057	0.034	-1.659	0.09
R-Square	0.35			
Adjusted R ²	0.33			
F-statistic	21.350			
Durbin Watson	1.253			
Effects specification	S.D.	Rho		
Cross-section random	0.48	0.787		
Idiosyncratic random	0.212	0.212		

Another important issue of increase in cost due to distance was measured by distance variables between Sri Lanka and its trading partners. However, it was found negative association and deterioration impact of Sri Lanka's export by -58% between Sri Lanka and its trading partners. This result was statistically significant. Finally, to see the financial impact over SAARC region it was formulated the financial crisis dummy variable in the gravity model and here it was found negative relation with coefficient value -0.05 which showed that it was diminishing export of Sri Lanka by 5% and this result was significant statically.

5. Conclusion and recommendations

The nations of the SAARC were hit by the worldwide monetary emergency which could be seen as an effect of financial deregulatory policies in developed countries and a result of the eccentric increment in oil prices and nourishment costs. Be that as it may, its effect differs starting with one nation then onto the next. The economies of the area experienced slowdown in economic growth alongside seriousness in other macroeconomic markers like widening current account deficits, falling foreign exchange reserves and depreciating currencies. The gauges of the worldwide economies by different associations like world bank, IMF have genuine ramifications for the SAARC member nations since it postures danger to their financial development.

Budgetary crises were also considered as one of vital and unswerving components in financial foundation every once in a while. On wide range money related emergency was concentrated. Cerra & Saxena (2008) and IMF (2009) opine that money related emergency was to a great extent connected with quick and steady diminishing in yield level. Kaminsky & Reinhart (1999) found that managing an account segment bankruptcy in-certainty starts the emergencies. Reinhart & Rogoff (2010) saw that benefits markets breakdown, government obligations and a predictable fall in yield and jobs were the essential reasons of monetary emergencies.

The key objective of the study was to estimate the impact of Global Financial Crisis on export of countries of SAARC region. Gravity model begins from Newton's law of universal gravitation. Bergen (1962) and Poyhonen (1963) start utilization of this thought in global exchange. According to display, as gravitational power between two items, depends straightforwardly on their particular mass, similarly, the volume of exchange between two nations, (where GDP is utilized as an intermediary of mass) and contrarily on the separation between them. Linnemann (1966) gives traditional use of model. moreover, he incorporated and additional variable known as item organization of exchange stream.

In this connection, the earnestness of the emergency was not expected by either economists or strategy producers as overall economy was getting a charge out of high development rates going before the emergency. Expansionary monetary strategies, along these lines, were not exhibited in an ideal way. Money related methodologies and measure to strengthen monetary structure were driven by many countries. Help packs included base undertakings, pay trades and assessment decreases, while work market plan were to a significant degree disregarded. Various rising economies reinforced their money related positions before the emergency and made a great deal of space to complete monetary packs than bleeding edge economies. Gathered commitments resources in remote monetary standards frequently surpassed the outside commitment liabilities, however

equity liabilities created in relative centrality and more credits were named in neighborhood coinage. Interestingly with the Asian Crisis, coinage devaluations were less genuine, exchange rates, regardless, changed more. Liabilities and equity wealth impacts basically overhauled stood out from the Asian Crisis, negative results for commitment holding in appreciation to US was on occasion in the midst of 2008-09.

As a matter of fact, financial markets of SAARC countries remained less vulnerable to financial crisis or bad-loan crisis because of having less exposure to subprime assets and high capital to risk assets ratio. However, trade of goods and services of the SAARC countries with the developed economies resulted in negative effects on most of the SAARC countries. Timely response by the countries could save the prolonged negative influence of financial crisis. In this perspective, India is a good example. Better coordination between Monetary and fiscal policies, having less integration of stock market of India with the most vulnerable countries and having good spread of exports to different parts of the world resulted in less vulnerability of Indian exports from the financial crisis. Financial crisis had serious repercussion for other countries of the SAARC region due to lack of appropriate response.

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