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Research Paper



AN ECONOMETRICS ANALYSIS OF INDIA'S BILATERAL TRADE WITH SAARC

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	ABSTRACT			

The South Asian Association for Regional Cooperation (SAARC) is an economic and geopolitical f L organisation of eight South Asian nations. It plays the role of a guiding force for the member countries. The main objective of the SAARC is to promoting "welfare economics" and "collective self-reliance" among the South Asian nations. The member countries of the SAARC aim to strengthen "cooperation among themselves in international forums on matters of common interests". The main objectives of the study were to know the India's bilateral relations with SAARC nations and to analyse the growth and instability of time series data in India's trade with SAARC nations during the period from 2001-02 to 2015-16. The present study is totally based on secondary sources. These sources were collected from various sites like Ministry of Commerce, Reserve Bank of India etc., The data is fed into the computer using MS-Excel, SPSS software package. The data is analyzed and interpreted according to the objectives of the study. The results of the study reveals that the computed 't' value is significant for all the variables during the period under consideration and the computed d-statistic shows no autocorrelation in India's total exports to world. However, the computed d-test statistic for India's imports from SAARC Region do not reject the null hypothesis and India's exports to SAARC region has shown that the test is inconclusive. The other variables like India's total exports to World and India's total imports from World have rejected the null hypothesis. Hence for correcting autocorrelation the GLS method have been used during the period from 2001-02 to 2015-16

KEYWORDS: SAARC Nations, India, Auto-correlation

INTRODUCTION

The South Asian Association for Regional Cooperation (SAARC) is an economic and geopolitical organisation of eight South Asian nations. It was formed under Article 52 of the United Nations' Charter providing existence of regional arrangements or agencies for dealing with such matters, relating to the maintenance of international peace and security with the purpose and principles of United Nations' charter. It plays the role of a guiding force for the member countries. SAARC The first SAARC summit was held in Dhaka on 8 December 1985, when the organisation was established. Afghanistan is the only new inclusion that happened since SAARC was established.

OBJECTIVE OF SAARC

SAARC's edifice is built upon a foundation of a strong set of objectives. Every decision SAARC takes and every policy it frames has guided by the overall objectives it had set for itself in the charter. Although promoting "welfare economics" and "collective self-reliance" among the South Asian nations are the commonly quoted objectives, yet there are some equally important focus areas which need a mention. "Accelerating economic growth" and cultural development in South Asia is one of the priorities, which come under the broader goal of improving quality of life.

Peace and security are essential elements for the success of meaningful regional cooperation for the benefit of the people of South Asia. As a founding member of SAARC, committed to regional cooperation, recently Indiancampaign to isolate Pakistan in the aftermath of Uri attack has worked with Sri Lanka becoming the fourth country after Bangladesh, Bhutan, and Afghanistanconfirming that it will not participate in the annual SAARC summit which is held on 9-10thNovember 2016 in Islamabad of Pakistan.

EPRA International Journal of Economic and Business Review | SJIF Impact Factor (2017) : 7.144 **Bangladesh Relations with India:**

India and Bangladesh are good neighbours. Geographic, cultural, historic and commercial ties are strong, and both countries recognize the importance of good relations. In the Bangladesh's struggle for independence from Pakistan in 1971, India helped in gaining independence of Bangladesh, and furnished relief and reconstruction aid during the post war period. Notwithstanding the development that India and Bangladesh have witnessed in recent years, the two countries together still contain a large number of extremely poor people living on one dollar a day, this is the real challenge posed before the two countries. Although they are situated in a region endowed with vast resources, they have failed to convert these resources into productive and collective wealth in an accelerating manner. Together India and Bangladesh boast a total population of more than 1 billion, and their rapid domestic economic development has demonstrated broad prospects for cooperation.

Sri Lanka relations with India

Bilateral relations between Sri Lanka and India have been generally friendly, but were affected by the Sri Lankan civil war and by the failure of Indian intervention during the Sri Lankan civil war. India is Sri Lanka's only neighbor, separated by the Palk Strait; both nations occupy a strategic position in South Asia and have sought to build a common security umbrella in the Indian Ocean. India - Sri Lanka relations have undergone a qualitative and quantitative transformation in the recent past. India was first country to respond to Sri Lanka's request for assistance after the tsunami in December 2004

Nepal relations with India

Nepal's association with India traditionally has been very close. Because of strong cultural, religious, linguistic, and economic ties, India and Nepal restored trade relations in 1990 after a break caused by India's security concerns over Nepal's relations with China. Nepal played an active role in the formation of SAARC and is also the headquarters of its secretariat. Nepal is also a signatory of the agreement on South Asian Free Trade Area (SAFTA), which came into force on January 1, 2006. A SAFTA Tariff Liberalization Program (TLP) was scheduled to be implemented from July 1, 2006. All member countries, except for Nepal, whose TLP started on August 1, 2006, reduced tariffs for each other.

Bhutan relations with India

Bhutan's economy, one of the world's smallest and least developed, is based on hydroelectricity, tourism, agriculture, and forestry. Diplomatic relations between India and Bhutan were established in 1968 with the appointment of a resident representative of India in Thimphu. Before this, our relations with Bhutan were looked after by our Political Officer in Sikkim. The Kingdom attaches great importance to SAARC. Ever since the inception of SAARC, Bhutan has firmly supported and promoted the activities, and worked

towards making the South Asian Region self-reliant. This is in consistent with its policy of developing friendly relations with all the neighboring countries. It has also displayed a keen interest in economic cooperation and various peacemaking efforts in South Asia.

Pakistan relations with India

Historically, Pakistan has had difficult and volatile relations with India, long-standing close relations with China, extensive security and economic interests in the Persian Gulf, and wide-ranging bilateral relations with the United States and other Western countries. It expresses a strong desire for a stable Afghanistan. Trade cooperation between India and Pakistan was a direct outcome of the partition of Indian subcontinent on August 14, 1947. At that time, India and Pakistan were highly dependent on each other for trade. Thereafter, both resorted to deliberate measures to minimize their trade dependence on each other.

India and Pakistan are theneighboring and developing countries of the SAARC region. India is comparatively larger in terms of her size, population, GDP etc., since partition, relations between Pakistan and India have been characterized by rivalry and suspicion. Although many issues divide the two countries, the most sensitive one since independence has been the status of Kashmir.

Maldives Relations with India

India enjoys a considerable influence over Maldives' foreign policy and provides extensive security co-operation especially after the Operation Cactus in 1998 during which India repelled Tamil Mercenaries who invaded the country. As founder member in 1985 of the South Asian association for Regional Cooperation SAARC, the Maldives has taken the lead in calling for a South Asian Free Trade Agreement, the formulation of a Social Charter, the initiation of informal political consultations in SAARC forums, the lobbying for greater action on environmental issues, the proposal of numerous human rights measures such as the regional convention on child rights and for setting up a SAARC Human Rights Resource Centre.

Afghan relations with India

Bilateral relations between India and Afghanistan have been traditionally strong and friendly. While India was the only South Asian country to recognize the Soviet-backed Democratic republic of Afghanistan in the 1980s, its relations were diminished during the Afghan civil wars and the rule of the Islamist Taliban in the 1990s. India aided the overthrow of the Taliban and became the largest regional provider of humanitarian and reconstruction aid. The new democratically elected Afghan government strengthened its ties with India in wake of persisting tensions and problems with Pakistan, which was suspected of continuing to shelter and support the Taliban. India is the largest regional investor Afghanistan, having committed more than US\$ 2.2 billion for reconstruction purposes.

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Table 1: India's Merchandise Trade with SAARC nations during 2001-02 to 2016-17 (Values in US\$.

			N	1illions)				
Countries & Year	India's Exports to Afghanistan	India's Exports to Bangladesh	India's Exports to Bhutan	India's Exports to Maldives	India's Exports to Nepal	India's Exports to Pakistan	India's Exports to Sri Lanka	% share of India's exports to SAARC in India's total world exports
2001-02	24.37	1,002.18	7.6	26.88	214.46	144.01	630.89	4.6784
2002-03	60.77	1,176.00	39.05	31.59	350.36	206.16	920.98	5.2825
2003-04	145.47	1,740.74	89.49	42.34	669.35	286.94	1,319.20	6.7252
2004-05	165.44	1,631.12	84.58	47.61	743.14	521.05	1,413.18	5.514
2005-06	142.67	1,664.36	99.17	67.58	859.97	689.23	2,024.67	5.3813
2006-07	182.11	1,629.57	57.66	68.68	927.4	1,350.09	2,258.30	5.1211
2007-08	249.21	2,923.72	86.74	89.72	1,507.42	1,950.53	2,830.43	5.9079
2008-09	394.23	2,497.87	111.15	127.91	1,570.15	1,439.88	2,425.92	4.6235
2009-10	463.55	2,433.77	118.86	79.86	1,533.31	1,573.32	2,188.01	4.6941
2010-11	422.41	3,242.90	176.03	100.14	2,168.06	2,039.53	3,507.50	4.6661
2011-12	510.9	3,7 89.20	229.86	124.6	2,721.57	1,541.56	4,378.79	4.3458
2012-13	472.63	5,144.99	233.22	122.36	3,088.84	2,064.79	3,983.87	5.0302
2013-14	474.34	6,166.93	355.6	106.07	3,592.30	2,274.26	4,534.35	5.5673
2014-15	422.56	6,451.47	333.94	152.38	4,558.77	1,857.18	6,703.72	6.5993
2015-16	526.6	6,034.94	468.95	179.04	3,930.09	2,171.14	5,309.53	7.0991
CGR	19.289	14.275	22.909	12.732	21.716	20.006	15.388	
R ²	0.772	0.944	0.803	0.877	0.947	0.768	0.917	
t-cal	6.631	14.790	7.286	9.650	15.195	6.560	12.013	
CV	56.87 /www.commerce.n	60.25	79.80	49.40	72.90	57.23	58.69	

Source: http://www.commerce.nic.in/eidb/

TRENDS OF INDIA'S BILATERAL TRADE WITH SAARC

Table 1 shows India's merchandise trade with SAARC nations during 2001-02 to 2016-17 in terms of US dollars. The challenges in the exchange rates between rupee and dollar affect the value of India's exports and imports expressed in terms of rupees. Hence, it is felt that India's trade expressed in terms of US dollars will give more reliable information that expressed in terms of rupees. This is particularly true because as per Economic Survey 2015-16, India's rupee has depreciated by 39.64per cent (From 1US\$= Rs. 47.692 in 2001-02 to 1US\$ = Rs.66.596 in December 2015-16) between 2001-02 and 2015-16. Hence, India's exports to and imports from expressed in terms of rupees will be an over estimation of their real value. Accordingly, an attempt is made here to analyse India's exports to and imports from SAARC in terms of US dollars.

It could be seen from the table that India's exports to the SAARC nations during the period from 2001-02 to 2015-16 in terms of Millions of US Dollars. The India's exports to Bhutan rising from US \$7.6 millions in 2001-02 toUS \$468.95 millions in 2015-16 put up more than 61 times increased followed by Afghanistan (21 times), Nepal (18 times), Pakistan (15 times), Sri Lanka (8 times), Maldives (7 times) and Bangladesh (6 times) respectively during the period under consideration. The Bhutan registered highest rate of per cent of Compound Growth Rate of 22.909 per cent followed by Nepal (21.716 per cent), Pakistan (20.006 per cent), Afghanistan (19.289 per cent), Sri Lanka (15.388 per cent), Maldives (12.732 per cent) and Bangladesh (16.84 per cent) respectively during the period from 2001-02 to 2015-16. In addition, the share of India's exports to SAARC, as a proportion of her total global exports, which stood at 4.68 per cent in 2001-02 decelerated to 4.35 per cent in the year 2011-12 but picked up to 7.09 per cent in the terminal year, 2015-16.

The growth rates of India's exports to SAARC nations were statistically significant at one per cent probability level as the computed 't' values are higher than the table or critical t-value of 2.95. The high levels of R² values indicate the goodness of fit of the model to the data. The highest value of Coefficient of Variation (CV) shows less consistency and highest variability among the others and vice versa. The coefficient of variation of India's exports to Maldives shows 49.40 per cent during the period from 2001-02 to 2015-16. It concludes that the Maldives has been highest consistency and less variability compared with other SAARC region countries during the period under consideration.

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			(values	in US\$. Mil	nonsj			
Countries& Year	India's Imports from Afghanistan	India's Imports from Bangladesh	India's Imports from Bhutan	India's Imports from Maldives	India's Imports from Nepal	India's Imports from Pakistan	India's Imports from Sri Lanka	% share of India's imports from SAARC in India's total world exports
2001-02	17.52	59.12	23.92	0.4	355.94	64.76	67.38	1.1457
2002-03	18.46	62.05	32.15	0.33	281.76	44.85	90.83	0.8637
2003-04	40.51	77.63	52.37	0.37	286.04	57.65	194.74	0.9076
2004-05	47.01	59.37	71	0.61	345.83	94.97	378.4	0.8942
2005-06	58.42	127.03	88.77	1.98	379.85	179.56	577.7	0.9475
2006-07	34.37	228	142.05	3.05	306.02	323.62	470.33	0.8116
2007-08	109.97	257.02	194.72	4.15	628.56	287.97	634.96	0.8414
2008-09	126.24	313.11	151.79	3.97	496.04	370.17	356.57	0.5986
2009-10	125.19	254.66	153.11	3.63	452.61	275.94	392.19	0.5747
2010-11	146.03	446.75	201.57	31.38	513.4	332.51	501.73	0.5878
2011-12	132.5	585.73	202.55	18.89	549.97	397.66	637.43	0.516
2012-13	159.55	639.33	164	6.29	543.1	541.87	625.81	0.5461
2013-14	208.77	484.34	152.17	3.97	529.93	426.88	666.93	0.5493
2014-15	261.91	621.37	149.87	4.32	639.91	497.31	756.17	0.6542
2015-16	307.9	727.15	281.27	4.29	470.59	441.03	742.79	0.7808
CGR	21.507	22.128	14.578	25.920	4.970	18.377	14.383	
R ²	0.910	0.912	0.720	0.575	0.610	0.795	0.649	
t-cal	11.489	11.621	5.788	4.195	4.513	7.099	4.900	
CV	73.92	71.91	52.14	143.37	26.45	57.30	47.15	

Table 2: India's Merchandise Trade with SAARC nations during 2001-02 to 2016-17 (Values in US\$, Millions)

Source: http://www.commerce.nic.in/eidb/

Table 2 incorporates India's imports from the SAARC nations during the period from 2001-02 to 2015-16 in terms of Millions of US Dollars. It could be seen from the table that India's imports from Afghanistan rising from US \$ 17.52 millions in 2001-02 to US \$ 307.9 millions in 2015-16 put up more than 17 times increased followed by Bangladesh (12 times), Bhutan (11 times), Sri Lanka (11 times), Maldives (10 times), Pakistan (7 times) and Nepal (1 time) respectively during the period from 2001-02 to 2015-16. The Maldives registered highest rate of per cent of Compound Growth Rate of 25.92 per cent followed by Bangladesh (22.13 per cent), Afghanistan (21.51 per cent), Pakistan (18.38 per cent), Bhutan (14.58 per cent), Sri Lanka (14.38 per cent) and Nepal (4.97 per cent) respectively during the same period. In addition, the share of India's exports to SAARC region stood at 1.15 per cent in 2001-02 decelerated to 0.78 per cent in the terminal year, 2015-16.

The growth rates of India's imports from SAARC nations were statistically significant at one per cent probability level as the computed 't' values are higher than the table or critical t-value of 3.25. The high level of R² value indicates the goodness of fit of the model to the data. As could be seen from the table, the following countries shown high variabilityand less consistency which is registered Maldives

as 143.37 per cent of coefficient of variation followed by Afghanistan (73.92 per cent), Bangladesh (71.91 per cent), Pakistan (57.30 per cent), Bhutan (52.14 per cent), Sri Lanka (47.15 per cent) and Nepal (26.45 per cent) during the period from 2001-02 to 2015-16.

Table 3 furnishes India's exports to and imports from the SAARC region during the 15 year period from 2001-02 to 2015-16 in terms of millions of US Dollars. It could be seen from the table that India's exports to SAARC Region rising from US \$2050.38 millions in 2001-02 to US \$18620.28 millions in 2015-16 and registered Compound Growth Rate of 16.538 per cent during the period under consideration. Nevertheless, as viewed from India's total exports to world, which registered a growth of 15.756 per cent, India's exports to SAARC Region were relatively high. On the other hand, India's imports from SAARC Region in terms of US ollarss increased from US \$ 589.03 millions to US \$ 2975.01 millions registering CAGR of 12.919 per cent as against India's overall import growth rate of 17.73 per cent during the period from 2001-02 to 2015-16. The growth rates of India's exports to SAARC Region as well as to world and India's imports from SAARC Region as well as her total imports from the world were statistically significant at one per cent probability levels as the computed 't' values are higher

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Table 3: Growth of India's Trade with SAARC Region (Values in US\$. Millions)							
Year	India's total Exports to SAARC Region	India's Total Imports from SAARC Countries	Balance of Trade	India's total exports to World	India's total Imports from World	Balance of Trade	
	(1)	(2)	(1)-(2)	(3)	(4)	(3) - (4)	
2001-02	2050.38	589.03	1461.35	43826.72	51413.27	-7586.55	
2002-03	2784.90	530.43	2254.47	52719.43	61412.13	-8692.70	
2003-04	4293.52	709.31	3584.21	63842.55	78149.10	-14306.55	
2004-05	4606.14	997.19	3608.95	83535.94	111517.42	-27981.48	
2005-06	5547.65	1413.31	4134.34	103090.53	149165.72	-46075.19	
2006-07	6473.81	1507.45	4966.36	126414.05	185735.23	-59321.18	
2007-08	9637.76	2117.35	7520.41	163132.18	251654.00	-88521.82	
2008-09	8567.12	1817.89	6749.23	185295.36	303696.30	-118400.94	
2009-10	8390.69	1657.34	6733.35	178751.43	288372.87	-109621.44	
2010-11	11656.59	2173.37	9483.22	249815.55	369769.12	-119953.57	
2011-12	13296.47	2524.74	10771.73	305963.92	489319.48	-183355.56	
2012-13	15110.70	2679.95	12430.75	300400.58	490736.64	-190336.06	
2013-14	17503.84	2472.98	15030.86	314405.30	450199.78	-135794.48	
2014-15	20480.02	2930.85	17549.17	310338.48	448033.40	-137694.92	
2015-16	18620.28	2975.01	15645.27	262290.13	381006.62	-118716.49	
CGR	16.538	12.919		15.756	17.730		
R ²	0.952	0.875		0.912	0.876		
t-cal	16.022	9.537		11.640	9.566		
CV	59.80	46.36		55.36	58.50		

Source:http://www.commerce.nic.in/eidb/

-than the table or critical t-value of 3.25. The high levels of R^2 values indicate the goodness of fit of the model to the data. Since, India's exports to SAARC Region were more than that of her imports, India's trade balance with SAARC Region has all along been positive. In absolute terms India's positive trade balance with SAARC Region improved from US \$ 1461.35 millions to US \$ 15645.27 millions between the years 2001-02 and 2015-16. On the other hand, India's overall trade balance has all along been negative and rising in absolute terms.

As could be seen from the table, the instability as measured in terms of coefficient of variation (CV) was only 59.80 per cent in the case of India's exports to SAARC region and 55.36 per cent in the case of India's total exports to world. Similarly, India's imports from SAARC region registered 46.36 per cent and India's total imports from world registered higher instability of 58.50 per cent expressed in terms of coefficient of variation during the period from 2001-02 to 2015-16.

Test for the Presence of Auto (Serial) Correlation in the Time Series Export and Import Data

Since the exports and imports data are the time series data over the period of fifteen years from 2001-02 to 2015-16, there is a possibility of presence of Auto-correlation or serial correlation in the time series data. The most celebrated test for detecting serial correlation is that developed by statisticians Durbin and Watson. It is popularly known as the Durbin-Watson d statistic, which is defined as

$$d = \frac{\sum_{t=2}^{t=n} (\hat{u}_t - \hat{u}_{t-1})^2}{\sum_{t=1}^{t=n} \hat{u}_t^2}$$

The statistic is simply the ratio of the sum of squared differences in successive residuals to the Residual Sum of Squares (RSS). The following Null hypothesis was formulated in order to test autocorrelation against the findings of the analysis:

H0: There is no auto-correlation in India's total exports and imports and those to and from SAARC Region.

Table – 4
Test for the Auto (serial) Correlation of the Error Term in the Time Series India's Exports and
Imports Data

	Durbin-Watson d - Statistic			Result at 0.05 probability or 5 %			
Variable	d- Computed	d-Lower Limit	d – Upper Limit	Significant level			
India's total exports to World	0.927	1.077	1.361	d <dl Reject</dl 			
India's total imports from World	0.765	1.077	1.361	d <dl Reject</dl 			
India's exports to SAARC Region.	1.269	1.077	1.361	dL <d<du test is inconclusive</d<du 			
India's imports from SAARC Region.	1.808	1.077	1.361	4-dU>d>dU do not reject			
Source: Computed for data in Tables 3							

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It could be observed from the table that in the case of India's Imports from SAARC Region, the computed d-test statistic was 1.808, which was higher than the upper limit of the d-statistic (1.361) for 15 degrees of freedom at 5 per cent probability level. Hence, the null hypothesis is not rejected and it is concluded that there is no autocorrelation in India's imports from SAARC Region. However, the computed dtest statistic for India's exports to SAARC region has1.269 which lies between the d-lower limit of 1.077 and the dupper limit of 1.361. Hence, the test is inconclusive and hence one cannot ascertain the presence or absence of autocorrelation in the time series data on India's exports to SAARC Region. The Durbin d-statistic of India's total exports to World and India's total imports from World have 0.927 and 0.765 respectively which is less than the lower limit of the Durbin Watson table value. Hence it is concluded that there an autocorrelation in India's total exports to World and India's total imports from World.

So the two variables India's total exports to World and India's total imports from World should be estimated for correcting autocorrelation. Let us assuming an AR(1) scheme for the iteration methods of estimating , here by use the Prais-Winston estimating method in SPSS, India's total exports to World and India's total imports from World given =0.441 and =0.588 and these can now be used to transform the original model as in following equation:

$$(Y_{t} - Y_{t-1}) = (1 -) + (X_{t} - X_{t-1}) + u_{t} - u_{t-1}$$

We can express this equation as
$$Y_{t}^{*} = (1 + (2 + 2)^{*}X_{t}^{*} + (1 + 2)^{*}X_{t}^{*$$

where
$$_{1} = _{1}(1-)$$
, $Y_{t} = Y_{t} - Y_{t-1}$, $X_{t} = (X_{t} - X_{t})$
 $_{1})$, $_{2}^{*} = _{2}$ and $_{t}^{*} = u_{t} - u_{t-1}$

By applying Generalized Least Square (GLS) method to the India's total exports to World and India's total imports from World, the results are as follows:

 $\hat{Y}_{t}^{*} = 19250.063 + 20103.175 X_{t}^{*}$ and

27963.146+29601.280 X^{*}₊ respectively.

The above two equations are the suggested equations for India's total exports to World and India's total imports from World respectively.

CONCLUSION

An attempt has made to analyse India's merchandise trade with SAARC Nations during 2001-02 to 2015-16. The study reveals that the growth of India's exports to SAARC region was higher than that of her imports from SAARC region, India has all along been experiencing favourable and growing positive trade balance with SAARC region as against growing and negative trade balance of India's total trade with the world. The computed t-values for all the Nations as well as the four components of India's trade in US Dollars were higher than the table or theoretical t-values. Hence it indicates that the growth of all the four variables were statistically significant at one per cent probability level. India's imports from SAARC Region has no autocorrelation, India's exports to SAARC region has lie in between upper limit and lower limit of the Durbin Watson table. So it is concluded that it cannot ascertain the presence or absence of autocorrelation in the time series data. The other variables like India's total exports to World and India's total imports from World has less than the lower limit of the Durbin Watson table, it is concluded that there is a autocorrelation in the time series data. By applying GLS method the suggested equations of India's total exports to World and India's total imports from $\hat{Y}_{t}^{*} = 19250.063 + 20103.175 X_{t}^{*}$ and World are 27963.146+29601.280 X,* respectively over the period under consideration.

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