

Bilateral Trade between India and ASEAN: An Analytical Study 1991-2013

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ABSTRACT

The economic reforms of 1991 have changed the whole economic and foreign trade scenario of India towards the world in general and Southeast Asian countries in particular. ASEAN is today a vibrant, dynamic and rapidly growing regional group which is effectively managing its diversity and growth. In the developing world, ASEAN economies have the highest trade to GDP ratio. India has also gained a place of prominence at the global stage. As a result India and ASEAN-the two regional markets- can be combined together to provide a market of huge potential for growth and investment by both domestic and international investors. The objective of this paper is to study statistically the significance of the dependence of Indo-ASEAN trade on each other. Moreover the paper will also focus to study the association between ASEAN total imports and India's exports to ASEAN and to study the association between ASEAN total exports and India's imports from ASEAN. For this purpose the data for the period 1991-2013 has been collected regarding India-ASEAN trade.

Keywords: ASEAN, Exports, Imports, Regression Equation, Correlation, ANOVA.

Introduction

What has tempted the ASEAN to foster closer engagement with India at regional and multilateral level is India's growing economic profile. Realizing the fact that both regions are complementary rather than competitive with each other has given big push to trade and economic engagements. Various initiatives have been taken to overcome the barriers in deepening interactions between India- ASEAN like setting up of ASEAN Business Council, India-ASEAN Business Summit, India-ASEAN Negotiation Committee etc. but India-ASEAN Trade in Goods (TIG) Agreement(January,2010) has been another landmark development in greater integration of Indian economy with that of ASEAN. The bilateral trade has increased by more than 90 percent from US \$ 23.1 billion in 2004-05 to US \$ 68.16 billion by 2011-12. Considering this fact, it becomes imperative to study the significance of the dependence of India's exports to ASEAN on India's total exports to the world and to study the significance of the dependence of India's imports from ASEAN on India's total imports from the world. Moreover it is equally important to study the association between ASEAN total imports and India's exports to ASEAN and to study the association between ASEAN total exports and India's imports from ASEAN.

Objectives

- To study the dependence of India's exports to ASEAN on India's exports to the world.
- To study the dependence of India's imports from ASEAN on India's imports from the world.
- To study the association between ASEAN imports and India's exports to ASEAN.
- To study the association between ASEAN exports and India's imports from ASEAN.

Sources of Data

The study is based upon secondary source of data which has been collected from UN-COMTRADE Statistics Division at 1 digit SITC (Standard International Trade Classification) Rev. 2 for the period 1991-2013. Other sources of data include IMF-Foreign Trade Statistics yearbook and ASEAN Merchandise Trade Statistics Database.

Anbumani A**Research Methodology**

The tool of SPSS has been applied to test the significance of association and dependence between India-ASEAN trade for which the statistical tools such as correlation coefficients, regression analysis and ANOVA have been used. For calculating the share of ASEAN in the India's Exports and Imports and India's share in ASEAN trade, percentage method is used.

Data Analysis and Discussions**a) Studying the Significance of the Dependence of India's Exports to ASEAN on India's Exports to the World**

It is imperative to examine the significance of the regression equation of India's exports to ASEAN on India's exports to the world. For this purpose following set of hypothesis are framed:

Null Hypothesis: The regression equation of India's exports to ASEAN on India's exports to the world is **insignificant**.

Alternative Hypothesis: The regression equation of India's exports to ASEAN on India's exports to the world is **significant**.

Table 1: Share of ASEAN in India's Exports 1991-2013

Year	India's Exports to World US\$ Billion	India's Exports to ASEAN US\$ Billion	%Share of ASEAN in India's Exports
1991	17.90	1.01	5.60
1992	20.72	1.37	6.61
1993	22.24	1.65	7.42
1994	26.33	1.84	7.00
1995	31.70	2.70	8.51
1996	33.46	2.85	8.53
1997	34.79	2.46	7.08
1998	33.21	1.63	4.89
1999	36.67	2.23	6.07
2000	42.35	2.66	6.28
2001	43.88	3.32	7.56
2002	50.10	4.51	8.99
2003	59.36	5.07	8.54
2004	75.90	7.55	9.95
2005	100.35	10.28	10.25
2006	121.20	12.37	10.21

2007	145.89	13.82	9.48
2008	181.86	19.43	10.69
2009	176.76	17.90	10.13
2010	220.41	22.13	10.04
2011	301.48	29.04	9.63
2012	289.56	35.95	12.41
2013	336.01	41.86	12.45

Source: Author's calculations using UNCOMTRADE database, United Nation Statistical Division.

SPSS OUTPUT FILE : 1

Descriptive Statistics

	Mean	Std. Deviation	N
India Exports to ASEAN	10.5926	11.87800	23
India Exports to World	104.4404	99.75721	23

Correlations

		India Exports to World	India Exports to ASEAN
India Exports to World	Pearson Correlation	1	.990**
	Sig. (2-tailed)		.000
	N	23	23
India Exports to ASEAN	Pearson Correlation	.990**	1
	Sig. (2-tailed)	.000	
	N	23	23

** . Correlation is significant at the 0.01 level (2-tailed).

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.990 ^a	.980	.979	1.73991

a. Predictors: (Constant), India Exports to World

ANOVA^a

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	3040.337	1	3040.337	1004.306	.000^b
	Residual	63.573	21	3.027		
	Total	3103.910	22			

a. Dependent Variable: India Exports to ASEAN

b. Predictors: (Constant), India Exports to World

Coefficients^a

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
1 (Constant)	-1.715	.531		-3.227	.004
INEXWOR	.118	.004	.990	31.691	.000

a. Dependent Variable: India Exports to ASEAN

- SPSS output file 1 clearly shows that there is positive and high correlation (0.99) between India's exports to ASEAN and India's exports to the world. The p-value 0.00 is less than level of significance 0.01 therefore it can be concluded that the association between India's exports to ASEAN and India's exports to the world is **significant**.
- Moreover R square is 0.98 which means around 98% changes in India's exports to ASEAN are explained by the changes in total exports of India to the world. Since the value of R square is almost equal to one therefore it can be concluded that model is more reliable.
- The regression equation of India's export to ASEAN(X) on total exports of India to the world (Y) is $X = -1.715 + 0.118 Y$ and the value of regression coefficient of India's export to ASEAN on total exports of India to the world is **significant** as the p-value 0.00 is less than level of significance 0.01 and null hypothesis is rejected. Hence, results show that the dependence of India's export to ASEAN on total exports of India to the world is **significant**.
- ANOVA is one of the important applications of F –test and is used to test the overall strength of the model under study. Since p-value 0.00 is less than level of significance 0.01, therefore it may be concluded that regression equation of India's exports to ASEAN on India's exports to the world is **significant**.

b) Studying the Significance of the Dependence of India's Imports from ASEAN on India's Imports from the World

To examine the significance of the regression equation of India's imports from ASEAN on India's imports from the world following set of hypothesis are framed:

Null Hypothesis: The regression equation of India's imports from ASEAN on India's imports from the world is **insignificant**.

Alternative Hypothesis: The regression equation of India's imports from ASEAN on India's imports from the world is **significant**.

Table 2: Share of ASEAN in India's Imports 1991-2013

Year	India's Imports from World US\$ Billion	India's Imports from ASEAN US\$ Billion	%shareof ASEAN in India's Imports
1991	19.51	0.89	4.36
1992	24.45	0.95	3.88
1993	23.31	0.84	3.62
1994	28.65	1.70	5.92
1995	36.59	2.42	6.60
1996	39.11	2.75	7.04
1997	41.43	3.40	8.18
1998	42.42	4.32	10.18
1999	49.71	5.08	10.22
2000	52.94	4.29	8.12
2001	50.67	4.34	8.58
2002	57.45	4.80	8.37
2003	72.43	6.68	9.23
2004	98.98	8.54	8.64
2005	140.86	10.63	7.55
2006	178.21	16.30	9.15
2007	218.64	21.03	9.62
2008	315.71	26.69	8.46
2009	266.40	23.96	9.00
2010	350.03	29.45	8.41
2011	462.40	39.71	8.58
2012	488.98	46.96	9.60
2013	466.05	49.22	10.56

Source: Author's calculations using UNCOMTRADE database, United Nation Statistical Division.

SPSS OUTPUT FILE : 2

Descriptive Statistics

	Mean	Std. Deviation	N
India import from ASEAN	13.6935	15.25426	23
India imports from world	153.2578	159.17015	23

Correlations

		India imports from world	India import from ASEAN
India imports from world	Pearson Correlation	1	.993**
	Sig. (2-tailed)		.000
	N	23	23
India import from ASEAN	Pearson Correlation	.993**	1
	Sig. (2-tailed)	.000	
	N	23	23

** . Correlation is significant at the 0.01 level (2-tailed).

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.993 ^a	.986	.986	1.83536

a. Predictors: (Constant), India imports from world

ANOVA^a

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	5048.493	1	5048.493	1498.708	.000^b
	Residual	70.740	21	3.369		
	Total	5119.233	22			

a. Dependent Variable: India import from ASEAN

b. Predictors: (Constant), India imports from world

Coefficients^a

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	-.892	.537		-1.662	.111
	INIMWO	.095	.002	.993	38.713	.000

a. Dependent Variable: India import from ASEAN

- SPSS output file 2 clearly shows that there is positive and high correlation (0.993) between India's imports from ASEAN and India's imports from the world. The p-value 0.00 is less than level of significance 0.01 therefore it can be concluded that the association between India's imports from ASEAN on India's imports from the world is **significant**.
- Moreover R square is 0.98 which means around 98% changes in India's imports from ASEAN are explained by the changes in total imports of India from the world. Since the value of R square is almost equal to one therefore it can be concluded that model is more reliable.
- The regression equation of India's import from ASEAN(X) on total imports of India from the world (Y) is $X = -0.892 + 0.095 Y$ and the value of regression coefficient of India's import from ASEAN on total imports of India from the world is **significant** as the p-value 0.00 is less than level of significance 0.01 and null hypothesis is rejected. Hence, results show that the dependence of India's import from ASEAN on total imports of India from the world is **significant**.
- ANOVA is one of the important applications of F-test and is used to test the overall strength of the model under study. Since p-value 0.00 is less than level of significance 0.01, therefore it may be concluded that regression equation of India's imports from ASEAN on India's imports from the world is **significant**.

c) Studying the Association between ASEAN Imports and India's Exports to ASEAN

Table 3 clearly shows that the trend of India's share in ASEAN imports is rising but due to Asian financial crisis India's exports to ASEAN declined in 1998 but after that it has risen sharply even in the period of world recession. Ever since India started to engage seriously with ASEAN, it has emerged on global landscape for which the India-ASEAN summits provided a significant opportunity to become a credible interlocutor with the major powers of the rest of the world sector. To Study the association between ASEAN imports and India's exports to ASEAN following set of hypothesis are framed :

Null Hypothesis: The association between ASEAN imports and India's exports to ASEAN is **insignificant**.

Alternative Hypothesis: The association between ASEAN imports and India's exports to ASEAN is **significant**.

Table 3: Share of India's Exports in ASEAN Imports 1991-2013

Year	Imports of ASEAN US\$ Billion	India's exports to ASEAN US\$ Billion	% share of India in ASEAN imports
1991	180.22	1.01	0.56
1992	197.48	1.37	0.69
1993	225.78	1.65	0.73
1994	272.78	1.84	0.68
1995	341.44	2.70	0.79
1996	359.19	2.85	0.79
1997	367.29	2.46	0.67
1998	273.92	1.62	0.59
1999	294.62	2.23	0.76
2000	365.35	2.66	0.73
2001	338.66	3.32	0.98
2002	355.05	4.50	1.27
2003	397.92	5.07	1.27
2004	501.22	7.55	1.51
2005	576.45	10.28	1.78
2006	660.13	12.37	1.87
2007	748.25	13.82	1.85
2008	929.38	19.43	2.09
2009	715.78	17.90	2.50
2010	753.56	22.13	2.93
2011	786.28	29.04	3.69
2012	819.00	35.95	4.38
2013	851.72	41.86	4.91

Source: Author's calculations using UNCOMTRADE database, United Nation Statistical Division.

SPSS OUTPUT FILE : 3

		Correlations	
		Imports of ASEAN	India Export to ASEAN
Imports of ASEAN	Pearson Correlation	1	.882**
	Sig. (2-tailed)		.000
	N	23	23
India Export to ASEAN	Pearson Correlation	.882**	1
	Sig. (2-tailed)	.000	
	N	23	23

** . Correlation is significant at the 0.01 level (2-tailed).

SPSS output file 3 clearly shows that there is positive and high correlation (0.882) between ASEAN imports and India's exports to ASEAN. The p-value 0.00 is less than level of significance 0.01 therefore null hypothesis may be rejected and it can be concluded that the association between ASEAN imports and India's exports to ASEAN is **significant**.

d) Studying the Association between ASEAN Exports and India's Imports from ASEAN

The following Table 4 shows that the trend of India's share in ASEAN imports is rising but due to Asian financial crisis India's exports to ASEAN declined in 1998 but after that it has risen sharply even in the period of world recession. Ever since India started to engage seriously with ASEAN, it has emerged on global landscape. To Study the association between ASEAN exports and India's imports from ASEAN following set of hypothesis are framed:

Null Hypothesis: The association between ASEAN exports and India's imports from ASEAN is **insignificant**.

Alternative Hypothesis: The association between ASEAN exports and India's imports from ASEAN is **significant**.

Table 4 : Share of India's Imports in ASEAN Exports 1991-2013

Year	ASEAN Exports US\$ Billion	India's Imports from ASEAN US\$ Billion	% share of India in ASEAN Exports
1991	162.38	0.85	0.52
1992	182.79	0.95	0.52
1993	208.58	0.84	0.40
1994	256.54	1.69	0.66
1995	311.34	2.41	0.78
1996	329.35	2.75	0.84
1997	352.51	3.39	0.96

1998	326.75	4.32	1.32
1999	352.85	5.08	1.44
2000	420.92	4.29	1.02
2001	383.17	4.34	1.13
2002	401.90	4.80	1.20
2003	468.69	6.69	1.43
2004	567.13	8.54	1.51
2005	640.74	10.63	1.66
2006	758.72	16.30	2.15
2007	841.95	21.03	2.50
2008	966.06	26.69	2.76
2009	791.56	23.96	3.03
2010	790.01	29.45	3.72
2011	828.75	39.71	4.79
2012	867.49	46.96	5.41
2013	906.23	49.22	5.43

Source: Author's calculations using UNCOMTRADE database, United Nation Statistical Division.

SPSS OUTPUT FILE : 4

Correlations

		ASEAN exports	India imports from ASEAN
ASEAN exports	Pearson Correlation	1	.882**
	Sig. (2-tailed)		.000
	N	23	23
India imports from ASEAN	Pearson Correlation	.882**	1
	Sig. (2-tailed)	.000	
	N	23	23

** . Correlation is significant at the 0.01 level (2-tailed).

SPSS output file 4 clearly shows that there is positive and high correlation (0.88) between ASEAN exports and India's imports from ASEAN. The p-value 0.00 is less than level of significance 0.01 therefore null hypothesis may be rejected and it can be concluded that the association between ASEAN exports and India's imports from ASEAN is **significant**.

Conclusion

The upshot is that Indo-ASEAN trade has shown the significant association during the period of study. As a region, ASEAN has shown great dynamism in terms of trade with India. Due to India's sustained economic growth and increased unilateral liberalization, there is large potential for the expansion of India-ASEAN merchandise trade which has been untapped. Moreover the relevance of ASEAN has increased because two of India's largest partners i.e. European Union and the US are yet to exhibit any sign of economic expansion. Hence, India and ASEAN-the two regional markets- can be combined together to provide a market of huge potential for growth and investment by both domestic and international investors. The results and findings of the study can be summarized as follows:

Sr. No.	Null Hypothesis (H_0)	p-value	Level of Significance	Decision	Conclusion
1.	The regression equation of India's exports to ASEAN(X) on India's exports to the world(Y) is insignificant . Mean X=10.59, SD of X=11.87 Mean Y=104.44SD of Y=99.75	0.00	0.01	Rejected	The regression equation of India's exports to ASEAN on India's exports to the world is Significant .
2.	The regression equation of India's imports from ASEAN(X) on India's imports from the world(Y) is insignificant . Mean X=13.69, SD of X=15.25 Mean Y=153.25SD of Y=159.17	0.00	0.01	Rejected	The regression equation of India's imports from ASEAN on India's imports from the world is Significant .
3.	The association between ASEAN imports and India's exports to ASEAN is insignificant .	0.00	0.01	Rejected	The association between ASEAN imports and India's exports to ASEAN is Significant .
4.	The association between ASEAN exports and India's imports from ASEAN is insignificant .	0.00	0.01	Rejected	The association between ASEAN exports and India's imports from ASEAN is Significant .

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