


# **EXPLORING REGIONAL INTEGRATION BETWEEN SOUTH ASIA AND ASEAN: A GTAP ANALYSIS**

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## INTRODUCTION

- The world at large has witnessed a proliferation of PTAs which one started as an exception to GATT rules, but now appears to challenge the entire multilateral trading system.
- Provision for “Territorial Application – Frontier Traffic – Customs Union and Free-trade Areas” (Article XXIV of GATT) was built as an exception to one of the basic principles of the WTO i.e. Most Favoured Nation (MFN) Rule (Article I of GATT).
- The Asia and the Pacific countries are also not untouched with this phenomenon and several bilateral, plurilateral and inter-regional agreements have been signed and many more are being negotiated.
- Although, the outer structure of PTAs vary extensively, the core objective remains same i.e. reducing barriers to trade, especially tariffs, between member countries.**

The prevailing deadlock in the Doha round negotiations of the WTO resulted in the proliferation of RTAs. These agreements have become a real ‘noodle bowl’ in Asia and the Pacific and several concerns have been expressed on their structure and objectives





- While ASEAN is integrating under the overall umbrella of RCEP, however it is not clear if all other agreements will be subsumed in RCEP or will still continue to be operational.
- On other side, South Asia is now reaching towards a full FTA as most of the members are going to reduce or eliminate their duties soon.
- **In this context, the objective of this study is to examine the possible effects of regional integration between ASEAN and South Asia on various sectors as well as on macro-economic and trade indicators by using GTAP model and database.**
- To analyses the likely impact of regional integration between ASEAN and South Asia, this study used simulation with a computable general equilibrium (CGE) model. In CGE, equilibrium is simultaneously obtained in more than one market.



## Methodology

- This study is conducted with a multi country, general equilibrium closure. The purpose of the CGE simulations is to determine the effects of a change in trade policy on the endogenous variables of the model – prices, production, consumption, exports, imports and welfare. The simulation represents what the economy would look like if the policy change or shock had occurred.
- The difference in the values of the endogenous variables in the baseline and the simulation represents the effect of the policy change.
- The impact of regional integration on different regions is estimated by using Global Trade Analysis Project (GTAP) static model.
- The model assumes perfect competition, constant return to scale and profit and utility maximising behaviour of firms and household respectively.
- Hertel (1997) provides detail information about the structure and overview of GTAP model. The data used in this study is the version 8.1 (recent version available) of the GTAP database.

## Aggregation Strategy

The GTAP database is compiled for 134 countries/territories across the world and for 57 tradable commodities of the world. In this study, 134 countries/territories given in GTAP data base are mapped to 8 regions . The 57 sectors of GTAP data base are mapped into 18 sectors

No.	Region
1	ASEAN
2	SAARC
3	USA
4	China
5	RoK
6	Japan
7	EU_28
8	RestofWorld

No.	New Code	Comprising old sectors code
1	Paddy	pdr pcr
2	wheat	wht
3	plantfiber	pfb
4	oilseeds	osd
5	sugar	c_b sgr
6	vegetable	v_f
7	otherGrains	gro ocr
8	Dairy	rmk mil
9	ProcFood	vol ofd b_t
10	Livestock	ctl oap wol cmt omt
11	Fish	fsh
12	Extraction	frs coa oil gas omn
13	TextWapp	tex wap
14	LightMnfc	lea lum ppp fmp mvh otn omf
15	HeavyMnfc	p_c crp nmm i_s nfm ele ome
16	transcomm	trd otp wtp atp cmn
17	Util_cons	ely gdt wtr cns
18	OtherService	ofi isr obs ros osg dwe



## EXPERIMENT DESIGN



Given the unstable economic environment, unemployment is a general phenomenon around the world. Therefore, to make this study more realistic, standard closure is altered by changing the assumption of full employment for skilled and unskilled labour.

It is to be noted that the protection data supplied in GTAP is intended to represent a starting point for analysis. Data on protection is needed to adjust to make analysis more realistic and meaningful for the simulation.

Protection data in GTAP is available for the reference year 2007. In GTAP database the protection level is different from current tariff in the above eight regions. Therefore, the protection information in GTAP database for eight regions is altered to better reflect the reality.

The tariff data is extracted from World Integrated Trade Solution (WITS). The regional integration between ASEAN and SAARC will require substantial reduction in tariff rate between these two regions.



## Sector-wise tariff for the year 2009 (Percentage)

Product	ASEAN	SAARC	USA	China	Korea	Japan	EU_27	RoW
Paddy	26.88	22.50	11.20	65.00	5.00	0.00	7.70	10.59
Wheat	0.85	15.63	2.80	65.00	2.34	3.33	1.07	6.06
Plantfibers	1.75	8.00	0.00	5.67	1.50	0.00	0.00	4.65
Oil seeds	7.19	16.31	36.95	9.53	46.73	0.77	0.00	6.67
sugar	12.43	20.81	4.91	33.25	11.63	0.40	8.00	14.00
Vegetables	8.02	19.96	5.26	14.15	64.31	5.45	6.74	14.53
Other grains	5.39	15.99	3.73	9.39	69.60	1.51	2.41	8.36
Dairy	6.76	21.30	12.25	12.04	60.09	23.41	6.42	16.58
procfood	8.83	23.76	9.12	17.54	48.21	10.94	11.30	15.46
livestock	8.73	18.59	2.43	14.41	16.54	5.55	3.59	13.37
Fishing	4.61	15.69	0.13	10.89	17.54	4.30	7.90	10.95
Extraction	1.99	10.78	0.25	2.84	2.32	0.43	0.11	5.30
Textile	9.55	14.05	8.86	11.62	9.99	6.83	7.82	13.84
lightmnfc	7.75	16.32	2.42	10.36	5.52	1.99	2.67	10.61
heavymnfc	3.76	11.40	2.18	7.55	5.65	1.19	2.65	6.71

## Decomposition of Welfare Effect (Million US\$)

Region	Allocation	Endowment	Terms of Trade	Investment and Saving	Welfare
1 ASEAN	764	1785	4039	-460	6128
2 SAARC	925	6152	-1585	-563	4929
3 USA	-483	-818	-125	-80	-1506
4 CHINA	-326	-684	-567	278	-1299
5 RoK	-146	-253	-141	40	-499
6 Japan	-336	-655	-513	91	-1413
7 EU_28	-282	-158	-214	228	-426
8 RestofWorld	-502	-719	-909	466	-1664
Total	-385	4651	-14	-1	4251

- The decomposition of the welfare effects suggest that ASEAN's gain from the regional integration is primarily driven by allocation, endowment and terms of trade effects. For SAARC region, the welfare increase due to allocation and endowment effect.
- Allocative efficiency gain is mainly because of tariff reduction. Endowment gains are from increased employment. SAARC loses terms of trade because it is going to get lower prices for its exports because of tariff reduction, while it is higher for ASEAN.





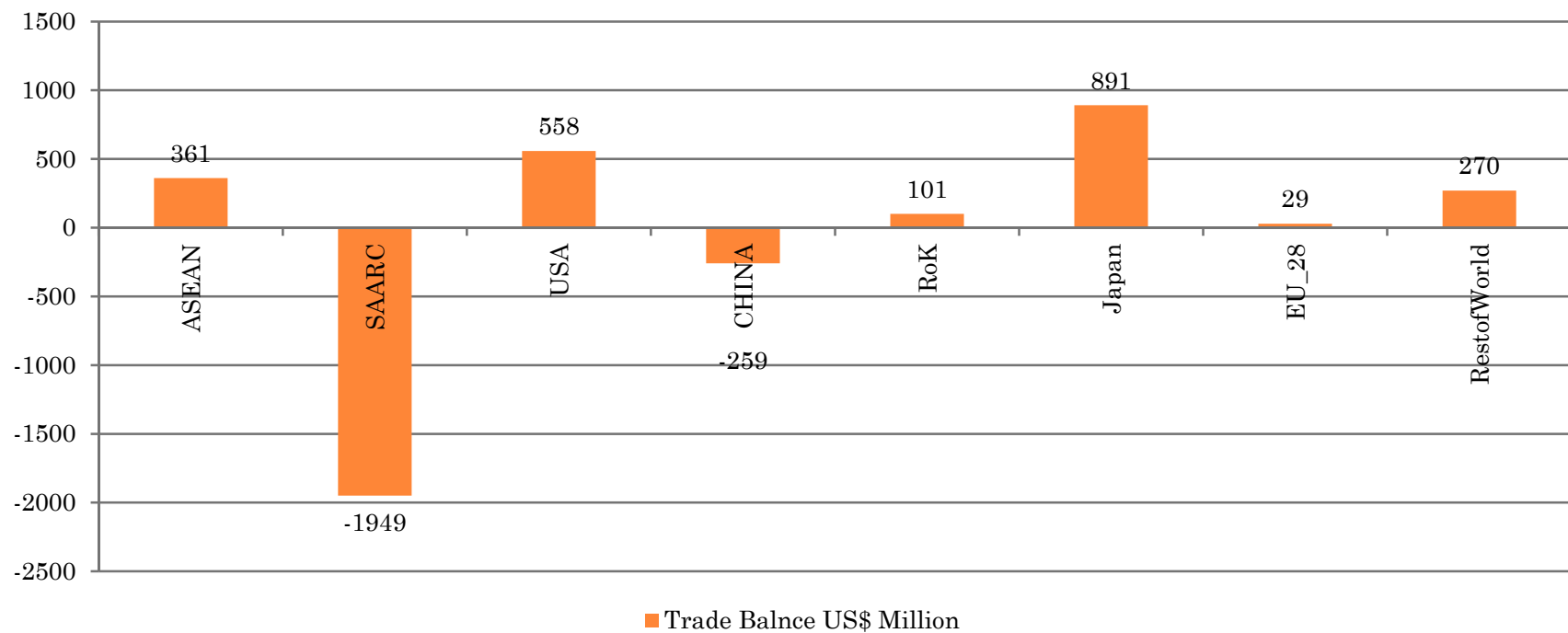
## IMPACT ON GDP (US million \$)

GDPEXP	1 cons	2 inv	3 gov	4 exp	5 imp	Total
1 ASEAN	7034	3302	1245	10244	-9883	11942
2 SAARC	-2662	656	-279	10465	-12414	-4235
3 USA	-2090	-761	-479	-239	796	-2772
4 CHINA	-759	-591	-300	-1286	1027	-1908
5 RoK	-361	-245	-103	-57	158	-608
6 Japan	-1439	-1205	-464	463	428	-2217
7 EU_28	-696	-199	-251	-1113	1142	-1117
8 RestofWorld	-2211	-1054	-641	-1776	2045	-3635
Total	-3182	-96	-1272	16702	-16701	-4550

- Regional integration between ASEAN and SAARC will lead to increase in GDP for ASEAN. All the components of GDP for ASEAN have shown positive increase. Remaining regions have experienced negative change in GDP.
- Domestic consumption falls because there is increased demand for export since prices in SAARC region go down due to huge tariff reduction compared to other region. Import increase because of huge tariff reduction, so import prices are much lower than domestic.

# IMPACT ON OVERALL TRADE BALANCE

Integration of SAARC and ASEAN will lead to increase in export and import from these regions. However, ASEAN will experience positive trade balance due to sharp increase in export in comparison to import. SAARC and China have negative trade balance after the simulation. All other regions have positive trade balance.



## Sector-wise trade balance (US \$ million)

- SAARC region will experience positive trade balance in 12 sectors out of 18 sectors. Textiles and Clothing, other services (Financial services, Insurance, Business services, Recreation and other services, Defence/Health/Education), light manufacturing and livestock have shown highest positive trade balance for SAARC region.
- ASEAN will gain in 6 sectors out of 18 sectors in terms of positive trade balance. Highest positive trade balance sectors for ASEAN are process food, extraction, vegetable and light manufacturing.

DTBALi	ASEAN	SAARC	USA	CHINA	RoK	Japan	EU_28	Rest of World
Paddy	-238.0	171.0	9.1	5.6	0.2	7.2	2.6	33.1
wheat	-50.7	78.5	-2.2	4.3	0.6	0.6	-8.4	-21.0
plantfiber	-6.1	-9.2	-2.7	5.3	0.9	0.2	0.5	8.4
oilseeds	-131.2	108.6	6.3	7.2	0.8	0.4	-3.1	-2.3
sugar	-66.5	61.1	0.5	0.3	-0.1	0.2	-2.3	-5.5
vegetable	308.6	-271.5	-14.0	25.1	1.6	3.9	-0.4	-85.5
otherGrains	-122.7	10.8	14.7	6.9	0.8	0.4	26.1	48.4
Dairy	-35.4	-4.2	4.0	0.7	0.2	2.2	-2.5	30.3
ProcFood	2449.9	-2531.0	10.8	32.3	-12.9	29.2	-63.8	-298.1
Livestock	-247.8	238.7	-11.8	9.0	1.2	5.9	3.0	-3.1
Fish	-25.7	5.1	-0.1	2.6	1.1	1.1	2.6	13.0
Extraction	1215.4	-1841.5	10.3	101.5	-40.5	-191.8	-40.7	5.3
TextWapp	8.4	1050.1	-35.8	-517.8	-59.1	-10.8	-343.7	-176.0
LightMnfc	453.9	383.6	-356.5	-78.3	-65.0	65.3	-526.7	-5.6
HeavyMnfc	11.5	-235.7	500.3	-166.7	51.9	585.0	-547.1	-600.5
transcomm	-1318.2	287.7	213.7	233.1	167.2	275.4	1170.2	833.7
Util_cons	-194.3	25.9	10.8	10.3	6.1	25.7	46.2	69.2
OtherService	-1649.9	522.2	200.1	59.4	45.6	91.0	315.5	416.1

## Change in Export (Million US\$)

•For ASEAN region, there is a sharp increase in export of heavy manufacturing, extraction, process food, and light manufacturing, vegetable and textile sector. However, export of other services, transport and communication, paddy and utility services declined after the simulation.

•In terms of export from SAARC, sectors like heavy manufacturing, light manufacturing, other services, and textile performed well after the regional integration between SAARC and ASEAN.

R001	1 ASEAN	2 SAARC	3 USA	4 CHINA	5 RoK	6 Japan	7 EU_28	8 Rest of World
1 Paddy	-114	178	6	3	0	0	3	7
2 wheat	0	8	-2	4	0	0	-8	-33
3 plantfiber	0	24	-3	0	0	0	0	6
4 oilseeds	-4	92	7	0	0	0	-3	-8
5 sugar	11	92	0	0	0	0	-2	-12
6 vegetable	411	16	-17	14	1	0	-1	-100
7 otherGrains	11	116	8	5	0	0	14	29
8 Dairy	36	23	4	0	0	0	-4	20
9 ProcFood	2975	300	-21	7	-17	4	-76	-368
10 Livestock	-79	244	-14	2	0	0	-5	-17
11 Fish	-12	6	1	2	1	1	4	12
12 Extraction	3089	446	33	50	0	0	-435	-424
13 TextWapp	397	1662	-42	-551	-75	-34	-357	-236
14 LightMnfc	1792	1950	-504	-141	-95	-60	-692	-308
15 HeavyMnfc	3557	4521	-48	-899	-39	265	-950	-1346
16 transcomm	-775	238	176	181	145	232	1115	708
17 Util_cons	-97	21	8	7	5	13	33	42
18 OtherService	-954	527	168	29	19	43	253	254
Total	10244	10465	-239	-1286	-57	464	-1113	-1775

## Change in Import (Million US\$)

- In case of import, all the sectors have shown positive sign after the simulation. Import of heavy manufacturing, extraction, light manufacturing, other services, transport and process food sectors have highest positive change after the simulation
- Import of heavy manufacturing, process food, extraction and light manufacturing increased sharply in SAARC region after the simulation.

R002	1 ASEAN	2 SAARC	3 USA	4 CHINA	5 RoK	6 Japan	7 EU_28	8 RestofWorld
1 Paddy	124	7	-3	-3	0	-7	0	-27
2 wheat	51	-70	0	0	-1	-1	0	-13
3 plantfiber	6	33	0	-5	-1	0	-1	-2
4 oilseeds	127	-17	0	-7	-1	0	0	-5
5 sugar	78	30	-1	0	0	0	0	-7
6 vegetable	102	288	-3	-11	-1	-4	-1	-15
7 otherGrains	134	105	-6	-2	-1	-1	-12	-20
8 Dairy	71	27	0	-1	0	-2	-1	-10
9 ProcFood	526	2831	-32	-26	-4	-25	-12	-70
10 Livestock	169	5	-2	-7	-2	-6	-8	-14
11 Fish	14	1	1	0	0	0	1	-1
12 Extraction	1874	2288	23	-52	40	192	-395	-442
13 TextWapp	389	612	-6	-33	-16	-23	-13	-60
14 LightMnfc	1339	1567	-147	-63	-30	-125	-166	-301
15 HeavyMnfc	3545	4757	-549	-732	-91	-321	-403	-746
16 transcomm	543	-49	-37	-52	-23	-44	-56	-126
17 Util_cons	97	-5	-3	-3	-1	-13	-14	-28
18 OtherService	696	4	-32	-31	-27	-49	-62	-162
Total	9883	12414	-796	-1027	-158	-428	-1143	-2046

## Percentage change in demand of export and import

- Except for six sectors, import prices ( $P_{im}$ ) declined after the simulation for ASEAN region. Highest decline in import prices was observed in oilseeds, livestock, sugar, and paddy. Import of all sectors ( $q_{im}$ ) especially oilseeds, paddy, live-stock and grains has increased after the simulation. Export price index ( $pxw$ ) of all the sectors increased especially fish, vegetable and oilseeds. There is positive change in aggregate export ( $qxw$ ) of vegetables, process food, extraction, light & heavy manufacturing and textile sector in ASEAN region.

For SAARC region, import prices sharply decline for process food, vegetables and grains. The percentage change in aggregate import of processed food, grains, vegetables and textile increased steeply. Export price index of all the sectors declined after the integration of ASEAN and SAARC. All the sectors especially livestock, oilseed, sugar, wheat etc. have positive change in aggregate export after the regional integration of SAARC and ASEAN region.





## Change in SAARC's Trade balance with regions

Except ASEAN, SAARC has positive trade balance with other region. It has huge negative trade balance (USD 29418 million) with ASEAN region

Trade balance	1 ASEAN	3 USA	4 CHINA	5 RoK	6 Japan	7 EU_28	8 RestofWorld
1 Paddy	115	2	0	0	0	8	45
2 wheat	5	6	0	0	0	2	65
3 plantfiber	17	-7	-2	0	0	0	-17
4 oilseeds	81	1	1	2	0	3	21
5 sugar	33	0	0	0	0	2	23
6 vegetable	-499	36	21	0	0	9	152
7 otherGrains	-82	7	7	0	2	15	59
8 Dairy	-41	5	1	0	0	8	22
9 ProcFood	-3564	78	42	27	16	215	625
10 Livestock	196	3	1	0	0	6	33
11 Fish	4	0	0	0	0	0	1
12 Extraction	-10465	17	337	18	31	750	7467
13 TextWapp	-661	386	389	42	22	532	336
14 LightMnfc	-2813	823	315	132	227	901	797
15 HeavyMnfc	-11909	1073	2045	526	595	2685	4737
16 transcomm	43	38	7	4	8	98	54
17 Util_cons	3	1	1	0	5	7	9
18 OtherService	120	109	19	7	5	181	83
Total	-29418	2579	3185	759	909	5422	14509

## Change in ASEAN's trade balance with other regions

With SAARC, it will have around USD 25833 millions positive trade balance. It is noteworthy that logically, ASEAN trade balance with SAARC should be equal to SAARC trade balance with ASEAN . However, due to various reasons like reporting period, fob or cif prices etc. these two figures are not matching. The main point to be noted is that ASEAN with have positive trade balance with SAARC region.

VIWS	1 ASEAN	2 SAARC	3 USA	4 CHINA	5 RoK	6 Japan	7 EU_28	8 RestofWorld
1 Paddy	5	-136	-5	-3	-1	-11	-10	-77
2 wheat	0	-5	-14	-5	0	0	0	-26
3 plantfiber	0	-19	5	0	0	0	0	7
4 oilseeds	1	-91	-17	-2	0	-1	-1	-19
5 sugar	4	-54	-3	-1	-1	-4	-1	-7
6 vegetable	3	441	-19	-47	-4	-9	-16	-39
7 otherGrains	3	58	-34	-13	-3	-14	-62	-58
8 Dairy	1	37	-9	-1	0	-3	-14	-46
9 ProcFood	10	3045	-117	-76	-17	-75	-110	-209
10 Livestock	2	-212	4	1	-1	-21	-27	6
11 Fish	0	-5	-3	-2	-2	-4	-3	-8
12 Extraction	97	8758	-228	-699	-771	-1897	-239	-3807
13 TextWapp	6	533	-324	54	16	-28	-149	-99
14 LightMnfc	19	2519	-350	-166	-86	-335	-563	-585
15 HeavyMnfc	86	11132	-2080	-2576	-622	-1565	-1814	-2550
16 transcomm	0	-43	-153	-86	-46	-97	-601	-422
17 Util_cons	0	-3	-13	-10	-8	-26	-77	-58
18 OtherService	0	-120	-247	-62	-55	-70	-670	-425
Total	236	25833	-3607	-3692	-1600	-4161	-4355	-8421

## Demand of Industrial Output (Percentage)

In ASEAN region, process food, vegetables, oilseed, fish, utility services sectors has highest growth after the simulation. However, plant fibre, wheat, paddy, livestock, sugar sectors not performed well. For SAARC region, out of 18 sectors, 14 sectors have shown positive growth in output

qo	ASEAN	SAARC	USA	CHINA	RoK	Japan	EU_28	Rest of World
Land	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
UnSkLab	0.43	0.95	-0.01	-0.04	-0.06	-0.04	0.00	-0.02
SkLab	0.29	1.06	-0.01	-0.05	-0.06	-0.04	0.00	-0.02
Capital	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NatRes	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Paddy	-0.57	0.49	0.20	-0.01	0.00	0.04	0.11	0.11
wheat	-1.54	-1.32	-0.01	0.00	0.10	0.00	-0.03	-0.06
plantfiber	-1.26	1.51	-0.05	-0.18	-0.01	-0.46	-0.04	0.00
oilseeds	1.02	-0.57	0.02	0.01	-0.13	0.03	-0.02	-0.03
sugar	-0.34	0.12	0.00	0.00	-0.04	0.06	-0.02	-0.02
vegetable	1.22	-0.48	-0.02	0.00	0.05	0.03	0.00	-0.04
otherGrains	-0.01	0.20	0.03	0.01	-0.02	0.02	0.02	0.02
Dairy	0.08	0.30	-0.01	-0.02	-0.03	-0.02	0.00	0.00
ProcFood	2.11	-2.57	-0.01	0.00	-0.06	-0.01	-0.01	-0.05
Livestock	-0.37	0.89	-0.02	-0.03	-0.03	0.00	0.00	-0.01
Fish	0.52	0.12	0.03	-0.01	0.00	0.01	0.01	0.01
Extraction	0.35	-0.16	0.00	0.02	0.13	0.20	-0.06	0.00
TextWapp	0.01	1.61	-0.06	-0.20	-0.27	-0.11	-0.13	-0.10
LightMnfc	0.44	0.98	-0.04	-0.03	-0.07	-0.02	-0.02	-0.02
HeavyMnfc	0.00	0.85	0.01	-0.01	-0.03	0.02	-0.01	-0.03
transcomm	-0.05	0.55	-0.01	0.00	0.01	-0.02	0.02	0.01
Util_cons	0.45	0.68	-0.02	-0.03	-0.06	-0.08	0.00	-0.02
OtherService	-0.06	0.55	-0.01	-0.03	-0.04	-0.03	0.00	-0.01
CGDS	0.74	0.79	-0.02	-0.04	-0.08	-0.11	0.00	-0.02

## **LIMITATION AND CONCLUSION**

This study used the GTAP static model on 18 tradable commodities and 8 regions of the world to understand the likely impact of SAARC and ASEAN regional integration.

This study updates the tariff protection for the eight regions and analyses the likely impact on welfare, macro-economic variables, and output, employment and trade indicators.

Under this study, a hypothetical scenario of a complete regional integration between SAARC and ASEAN is estimated by complete elimination of import tariff between these two regions but maintained for other regions.

Although it is unlikely that an agreement would result in the complete removal of tariffs on all products listed in national tariff lines, this experiment provides the maximilistic situation of tariff liberalisation for the complete integration of ASEAN and SAARC and thus the model expresses the upper-most level of benefit that can be achieved in the process



- However, eliminating tariffs on all products in SAARC and ASEAN cannot be a real situation as in all the PTAs in Asia-Pacific (as well as ASEAN FTA and SAFTA) there exists each PTA partner's sensitive or exclusion list covering products on which tariffs are not liberalised.
- This study does not adequately capture the service trade reforms and thus the result may underestimate the potential effect of liberalisation where services sector is to be included.
- It is to be noted that GTAP model has both static and dynamic version. However, in this paper, static GTAP model is used. Gilbert (2013) mentioned that the static model has disadvantage relative to dynamic techniques of not describing the time path, i.e. attention in the analysis is concentrated on the end outcome rather than the transition.
- Data aggregation is an issue, since the result may be different if one does detailed sectoral and country-level analysis. For the model in general: market structure (perfect competition, uniformity of functions across sectors and regions, etc) is too simplistic in the standard GTAP model.
- Studies that do incorporate imperfect competition tend to generate welfare estimates that are roughly double those of competitive models (Gilbert, 2013). This study gives only conservative outcome as it only considered only merchandise trade liberalisation.



- In terms of absolute value, highest welfare gain is attained by ASEAN and SAARC, whereas for other regions welfare effect is negative. Regional integration between ASEAN and SAARAC has led to increase in GDP for ASEAN. Remaining regions have experienced negative change in GDP.
- ASEAN will experience positive trade balance due to sharp increase in export in comparison to import. SAARC and China have negative trade balance after the simulation. All other regions have positive trade balance.
- About bilateral trade balance, ASEAN region will have huge positive trade balance with SAARC region. After the simulation, there is a increase in demand for unskilled and skilled labour in SAARC and ASEAN region.





