India-EU Free Trade Agreement: Bumpy Ride Ahead

Tavishi Tewary[1]

[1] *Research Scholar, NITIE, Mumbai, Email: tavu.tavishi@gmail.com*

Abstract: For the first time, in centuries, Europe has lost its sheen and is not a fulcrum in the globalized system of International Relations. The emergence of new Asian economies accompanied by financial crises back home has pushed European Union (EU) to the periphery of Global Economy. Europe has adopted a new foreign policy and started to strike Free trade Agreements (FTAs) with major trading partners. One such trade agreement is India –EU FTA which was initiated in 2007. This study examines major issues related to the EU-India FTA, with a focus on the likely impactson sectors that are important to poverty reduction and development.It employs Computable General Equilibrium modelto measure the consequences of tariff reduction for both the parties on their Export, Industrial output, employment and welfare.Numerous fundamental factors pertaining to this relationship have been analysed, with special reference to the increased presence of EU goods and businesses in India and the reduced scope for regulation that the FTA would entail.

Keywords: Free Trade Agreements, CGE Modeling, India EU Trade, GTAP database, Economics

INTRODUCTION

India-EU relations can be traced back to the early 1960s. Indian leaders had always supported the formation of former European Economic Community (EEC) and tried to maintain cordial relationship with it. In 1962, India was among the first few countries to set up diplomatic relations with the EEC. The EEC gained power as it evolved from a common market to a common community to a Union leading to transfer of many components of sovereignty from the member countries to the commission after the Lisbon treaty of 2009. India's partnership with European Union (EU) has also grown proportionately, and India has maintained close ties with the EU nations like Germany and France.

The bilateral relations between India and EU achieved new heights with the Joint Political Statement of 1993 and the Cooperation Agreement of 1994. They opened the way for annual Ministerial meetings between the two parties and initiated a political dialogue for building partnership on common areas of interest. Later, in September 2004, the relationship was taken a step further and a Strategic

Partnership was established and The Joint Action Plan of 2005 gave it a policy perspective. The EU acknowledged India as a 'regional and global leader, engaging increasingly on equal terms with other world powers'.

The European Commission (EC) and India started a comprehensive negation towards a Free Trade Agreement (FTA) in June 2007, which could help India in its economic development and poverty alleviation. A major highlight of any WTO backed FTA is that 'both parties should eliminate Tariffs on 'substantially all trade' in goods, covering both agricultural and manufacturedproducts, 'within a reasonable length of time'. Both the developing and the developed economy have interpreted the above statement according to their conditions and suitability. As the EU has generally deduced it to mean approximately 90% of trade liberalisation over a maximum period of ten years, India did not agree to it. As a result of this disagreement,theprocess came to a halt as India started seeking lower levels of liberalisation than initially proposed as it could harm its sensitive sectors. This resulted in rejection in the FTA proposal by EC as they treated both the parties as equal players in the negotiation process. There have been numerous studies proving that if a developing country enters into a free trade agreement with a richer partner, the former's vulnerable sectors (especially agriculture and small and medium enterprises) are prone to serious risks. The flexibility towards policy implementation also reduces significantly.

EU adopted a new trade strategy titled 'Global Europe: Competing in the World'. During this journey they decided to embark upon an undiscovered path of India EU free trade. This strategy was implemented as a measure to counter Europe's decreasing share of world market and to bolster EU's stand against formidable economies like China . EU is targeting large untapped markets in countries like India, South Korea and Central America by entering into FTAs as it fears that it might be left behind in the era of growing Regionalism.

Despite India's effort to reduce its tariffs during 1990s and beyond, (from 79% in 1999 to 17 % in 2005) it is still considered a relatively protected economy and its tariff levels remain significantly higher than the EU's 2% average. India has advocated a higher tariff structure on the grounds of an industrialization strategy for supporting its sensitive sectors. India has firmly objected to non agricultural market access (NAMA) proposals that would lead to drastic reduction in tariff usage for developing countries forcing them to capthem at low levels.

India EU trade agreement would lead to greater burden of commitments on the former as it has to reduce the tariff rates from an average of 17 % to 0% as compared to its counterparts which has to bring down the rates from 2% to 0% for the vast majority of respective product lines. In addition to this, India is far more dependent upon trade with the EU than vice versa, theeffects will be felt more deeply and widely across a range of sectors. This can be seen from the table given below.

From Table 1 and Table 2 it is evident that EU is a major trading partner of India and explains the total exports of EU to India and vice versa.

The new government at the centre under the leadership ofPrime Minister Modi as led to the constitution of a new Foreign Policy Team in Delhi since May 2014. In November 2014, under the able leadership of Commission President Jean-Claude Juncker,the EC has undergone significant organisational change. After the Lisbon treaty of 2009, there has been an enormous increase in the power of the president.

Table 1
Imports between EU and India

Indicators	Import Value to the EU/MS (EURO)	Import Value to the EU/MS (EURO)	Import Value to the EU/MS (EURO)	Import Value to the EU/MS (EURO)	Import Value to the EU/MS (EURO)
Partners	India	India	India	India	India
Years	2011	2012	2013	2014	2015
Austria	383295007	363159259	358036526	395098075	450040693
Belgium	5361854462	4239394879	4159598500	4092200199	4131353702
Bulgaria	61145881	75072879	123051562	114828205	140824789
Croatia	133123614	121149418	108023790	88362954	120321413
Cyprus	52689530	53818334	42057476	43815639	56208877
Czech Republic	301809909	299749734	294245547	336501792	381911235
Denmark	625495422	563628049	580025780	607874593	571524529
Estonia	27067212	32009289	27501429	22173125	24829880
Finland	574824986	248508992	400494138	272559605	199511361
France	3908138025	3968295447	3679606210	4360789792	4367329211
Germany	6534256650	6082525388	5936784633	5941203431	6297619375
Greece	604925476	286145081	322022294	322409460	285272142
Hungary	268488609	291701218	275456036	293504097	339678502
Ireland	308938187	304332351	321606396	380250479	427636075
Italy	4779516417	3749122135	3973926869	4172379068	4001079874
Latvia	22314625	35731329	37743756	30314593	31909464
Lithuania	32666441	30702623	49003335	45404457	51706612
Luxembourg	12473517	11532798	12583031	7415384	6031098
Malta	70862972	74394121	85694653	101481538	111241510
Netherlands	3902850383	4874721344	4593952361	3086956358	3676994678
Poland	637952657	653451965	789227679	951218340	1214453794
Portugal	467280384	336371107	392583884	491763031	458972182
Romania	392867854	365782785	306763521	224250896	241172567
Slovakia	103950813	93641160	107284593	126198406	149324470
Slovenia	235861496	223209282	244890090	165543399	272850425
Spain	2558955301	2614368741	2246514052	2421373062	2881119831
Sweden	744638728	599784737	567679462	593526060	641343042
United Kingdom	6818749855	6935399238	6806176265	7456432616	7912395964
EU28	39926994413	37527703683	36842533868	37145828654	39444657295

Source: EuroStat, 2016

Table 2
Exports between EU and India

Indicators	Export Value from the EU/MS (EURO)	Export Value from the EU/MS (EURO)	Export Value from the EU/MS (EURO)	Export Value from the EU/MS (EURO)	Export Value from the EU/MS (EURO)
Partners	India	India	India	India	India
Years	2011	2012	2013	2014	2015
Austria	829595909	623635617	655226568	617594087	739700088
Belgium	7992559212	7945699274	7902319354	8571685949	7819331178
Bulgaria	63932752	34133384	32689915	48623941	62447094
Croatia	23409688	16508891	6831107	13483149	17532046
Cyprus	16214446	14549642	10946339	11867319	11832432
Czech Republic	614123714	509477522	422930579	447150641	490324760
Denmark	422690049	346229559	287575005	312012443	337314373
Estonia	34769954	54363601	38031367	40421583	63072631
Finland	624961111	482761251	480728190	399949136	451010096
France	2985185315	3447012866	2889454885	2923832350	3526162165
Germany	10808986582	10380360704	9107718013	8868120288	9722769485
Greece	59570143	60487805	46598762	54966373	60837958
Hungary	350642819	221950416	164293675	159491766	191882716
Ireland	202762539	234374555	439310425	398368136	566592543
Italy	3735670005	3346365765	2971388526	3036837149	3350745805
Latvia	74915448	42394630	22496986	15255555	22005951
Lithuania	118575884	14325590	14557946	16350583	50916700
Luxembourg	53936722	51895873	39508337	32304569	40709384
Malta	14350648	14821355	26360387	13869073	15480866
Netherlands	1883570494	1966128041	1663202212	1898680845	1990097156
Poland	374661523	519431840	368209436	413047191	419202478
Portugal	89345046	94787584	116801497	95299407	79008036
Romania	196014410	212675232	230427572	180644477	229462976
Slovakia	68932753	55426476	32586689	30719228	53764295
Slovenia	98545012	89580756	78200996	78828240	83266087
Spain	1333123565	1259493267	1120425323	1127877611	1257062181
Sweden	1496480782	1298995867	1151119555	1140384878	1169515027
United Kingdom	6014794095	5203542215	5638727351	4677365761	5301586216
EU28	40582320620	38541409578	35958666997	35625031728	38123632723

Source: EuroStat, 2016

LITERATURE REVISITED

Preferential Trade Agreements involves removal of tariff and quotas.The defining characteristic of a Preferential Trading Agreement is that lower tariffs are imposed on goods produced in the member countries than on those produced outside.(Panagariya, 2000). It leads to both Trade Creation as well as Trade diversion. The former leads to welfare creation and the later loss in welfare of the society. Trade Creation takes place when the more efficiently produced imported goods from the new partner substitutes the domestic less efficient product. The later occurs when the sources of supply from an efficient nonmember is replaced by an inefficient member country. The net welfare impact of an RTA will depend onthe relative size of the two effects.

Table 3
Trade Creation and Trade Diversion

Authors	Data and methodology	Trade creation	Trade diversion
Silva and Tenreyro (2006)	Gravity model on bilateral export flows for136 countries in 1990	Strong evidence of trade Creation	-
Cadot et. al (2006)	Gravity model on bilateral imports for 130countries from 1962-1996. The paper focuses on EU, ANDEAN, MERCOSUR, NAFTA and ASEAN	There is evidence of trade creation effect for 5 out of 7 Preferential Trade Agreements analysed	The increase in intra-regionaltrade is coupled with areduction in imports from therest of the world in 6 out of7 Preferential Trade Agreements analysed
Magee (2008)	Gravity model on bilateral trade flows for 133 countries from 1980 to 1998	The long run impact of a PTA isestimated to be an 89% increase in trade flows	No evidence of trade diversion
Acharya et al. (2014)	Gravity model on bilateral trade flows for179 countries over the period 1970-2008	The impacton intra-PTA trade is positive for17 out of 22 PTAs analysed	Intra-PTA trade diversion; 5 PTAs lower theextra-PTA exports frommember to non-membercountries
Romalis (2007)	CGE approach on trade flows between the United States, Canada, Mexico and the Rest of the world in the period 1989-1999. The paper focuses on Canada-US Free Trade Agreement (CUSFTA) and North America Free Trade Agreement (NAFTA)	Evidence of trade creation only for trade flows involving Mexico	Evidence of trade diversion by CUSFTA and NAFTA
Baier and Bergstrand (2009)	Non-parametric estimations on bilateral trade flows for 96 countries over the period 1965-2000	Average long run effect of Preferential Trade Agreements on trade flows is positive.	

Against this backdrop the paper has tried to assess the quantitative impact of a free trade agreement between India and EU as there is a dire need of such an agreement for India to provide a shield against the recent mega FTAs like Trans Pacific Partnership.

METHODOLOGY

The study employs Computable general equilibrium (CGE) modeling to achieve its above mentioned objective. It works on the principle of Walrasian general equilibrium which was introduced in the nineteenth century, in which demand and supply are balanced across all of the interconnected markets in the economy. The models basic structure has been formalized by Arrow and Debreu (1954) using actual economic data to solve for the levels of supply, demand and price that support equilibrium across a specified set of markets. Many researchers have adopted this tool for policy analysis concerning welfare and distributional impacts of new policy initiatives, fiscal reforms, new tax structure (Burnett et al 2001; Gunning and Keyzer 1995), environmental policy implications (Weyant 1999; Bovenberg and Smulders 1995; Goulder 2002) and international trade (Shields and Francois 1994; Martin and Bach2001 ; Harrison et al 1997).This type of modeling takes an *ex-ante* approach, which involves quantifying the future effects of a new policy. It measures the domino effect arising from the changes taking place in one sector on the other sectors. These models are used to specially measure the effects of trade policy changes on the welfare levels and the distribution of income across multi-country regions

The model used in the study

The model used in the study assumes perfect competition in goods and labour market. The model describes the world in the year 2015. At this time the European Union consisted of 28 countries. It uses *Armington(* 1969) assumption for its utility functions and Cobb Douglas for Production function. This model divides the region into 4 parts.

- India

- European Union (28 countries)

- BRICS (Excluding India)

- Rest of the World

Sectors in the model:

- Agriculture

- Food Processing

- Light Manufacturing

- Heavy Manufacturing

- Construction

- Telecommunication

- Other Services

Inputs in the model

- Land

- Skilled Labour

- Unskilled Labour

- Natural Resources

Tariffs

In this model only obstacle for a free trade is the tariff barriers. The study excludes the non tariff barriers as they are difficult to model. For modeling the later, advolerum equivalents have to be calculated, thus making them tariff as well.

Calibration

The next step to solve the model is calibration. It is done by solving the model backwards and getting the values of the parameters of utility and production function.

Data

The GTAP database 9 has been used for analysis. It consists of 140 regions and 57economic sectors for the three benchmark year: 2004, 2007 and 2011 (Narayanan 2004 Aguiar, and McDougall, 2015). The study uses 2011 as the reference year for the analyses.

This database includes intermediate inputs among sectors and bilateral trade in goods and services, taxes and subsidies levied by governments of these countries. It was initially created for global applied CGE modeling, but now is also used by other modeling areas such as Multi-region Input Output analysis (Hertel, Hummels, and Walmsley, 2013), Social Accounting Matrix modeling (Thier felder and McDonald, 2012), Integrated Assessment Modeling (Elliott et al., 2010) and complex network science (Ukkusuri et al., 2016). It is important as it provides the inter-sectoral linkages within each country.

Experiment Design

The study undertakes four experiments by reducing the tariff between India and EU by 50% (Both on Exports and Imports) in the following sectors one at a time viz *Agriculture, Processed food and Light Manufacturing.* All these sectors in India are highly protected and enjoys high tariff regime. The impact of this tariff reduction is measured on *Exports,Percentage change in industrial output, Employment, and Welfare* of these regions taken for consideration.

Results

Experiment 1: 50% reduction in tariff of Agriculture sector.

As can be seen from the Table 4 EU and India both will be positively benefited from the reduction in tariff on Agricultural sector. EU would gain more in terms of exports as compared to India. The Rest of the World would lose as both the nations would gain from the FTA.

Table 4
Percentage change Exports and Imports of both
Trading Partners with a 50% reduction in Agricultural Tariffs

VXWD	EU imports from India	Indian imports from EU
Agriculture	8.59	55.28933
ProcFood	-0.02	-0.00763
LightMnfc	-0.18	0.104673
HeavyMnfc	0.33	-0.10162
Util_Cons	-0.07	0.073102
TransComm	-0.17	0.131399
OthServices	-0.24	0.153052
Total	0.28	6.383671

Source: Author's Calculation

Table 5
Percentage change in Industrial Output with a 50% Reduction in Agricultural Tariffs

Qo	BRCS	India	EU_28	ROW
Agriculture	-0.005	-0.053	0.204	-0.02
ProcFood	0.002	0.007	-0.007	0.007
LightMnfc	0.005	-0.039	-0.017	0.012
HeavyMnfc	-0.001	0.15	-0.037	0.013
Util_Cons	0	0.074	-0.005	-0.001
TransComm	0	0.021	-0.006	0.001
Other Services	0.001	-0.031	0	0
CGDS	0	0.096	-0.005	-0.003

Source: Author's Calculation

If industrial production is taken into consideration there will be a decline in output of agricultural sector but food processing sector would be benefitted with this tariff reduction. Also Indian heavy manufacturing would face a positive change in industrial output. As far as EU is concerned, it would be benefitted in terms of change in industrial output and agricultural contribution would increase by 0.204 %.

There will be a negative impact on skilled and unskilled labour in the agricultural sector. The employment will fall and labour will migrate from Agriculture to processed and heavy manufacturing. But In EU there will be a gain in employment in agricultural sector as people will shift from the others sector to agriculture.

The overall welfare gains for the first three regions are positive but there is a welfare loss to the rest of the world.Although the allocative efficiency of EU falls (-118.11) but is compensated with a huge increase in terms of trade (452.87). For India both these efficiency are positive.

After running Experiment 2 it was found that India's import from EU would ascend by an average of 1%. EU export to India will increase sharply in Processed food sector. EU's import from India would also increase but not to that extent. It increases only by 0.32%.

Table 6
Welfare Impact of 50% Reduction in Agricultural Tariffs

WELFARE	alloc_A1	tot_E1	6 IS_F1	Total
1 BRCS	78.74	39.54	-7.47	110.81
2 India	466.19	74.84	15.59	556.61
3 EU_28	-118.11	452.87	9.11	343.87
4 ROW	-57.28	-567.29	-17.23	-641.79
Total	369.54	-0.04	0	369.5

Source: Author's Calculation

There will be a negative impact on the industrial output of the processed food sector for India as it would fell by 0.15%For Europe the sector will positively contribute towards industrial output and the same would rise by 0.05%.

Table 7
Percentage change in Demand for Inputs
with a 50% Reduction in Processed foods Tariffs

qfe[**BRCS]	Agriculture	Proc Food	Light Mnfc	Heavy Mnfc	Util_ Cons	Trans Comm	Oth Services	CGDS
Land	0	0	0.002	0.002	0.002	0.002	0.002	0.002
UnSkLab	-0.001	-0.003	0.001	0.001	0	0	0	0
SkLab	-0.001	-0.003	0.001	0	0	0	0	0
Capital	-0.001	-0.003	0.001	0.001	0	0	0	0
NatRes	0	0	0	0	0	0	0	0

Source: Author's Calculation

There will be a fall in employment in Processed food sector for India as it reduces its tariff by 50%. EU will be benefitted as there will be employment creation in this sector. The capital flow will also increase for Europe and will fall for India.

Table 8
Welfare Impact of 50% Reduction
in Processed foods Tariffs

WELFARE	alloc_A1	tot_E1	6 IS_F1	Total
1 BRCS	1.04	-2.85	2.93	1.11
2 India	173.84	-21.93	-6.38	145.54
3 EU_28	26.37	100.69	4.02	131.09
4 ROW	-9.18	-75.92	-0.57	-85.67
Total	192.07	0	0	192.06

Source: Author's Calculation

There would be increase in welfare of all the three regions except rest of the world. Both India and Europe would be positively affected and there would be trade creation for both the parties.

After running Experiment *3,* if the tariffs are reduced by 50% EUs import from India would significantly increase by 4 .1%, whereas India's import from EU would also increase by 5.73%. Both the parties will be positively impacted.

If there is a tariff reduction in light manufacturing, the industrial output for both the countries would increase. Both the countries would be benefited in terms of employment creation and capital investment if they reduce the tariff of the light manufacturing Sector. Skilled labour for India will increase and will lead to opening of new units as well. (as depicted by positive change in land endowment.)

Table 9
Welfare Impact of 50% Reduction in Light Manufacturing Tariffs

WELFARE	alloc_A1	5tot_E1	6 IS_F1	Total
1 BRCS	-53.72	-204.42	14.03	-244.11
2 India	802.16	329.77	23.09	1155.03
3 EU_28	151.68	247.99	-0.93	398.74
4 ROW	-65.66	-373.51	-36.19	-475.37
Total	834.46	-0.17	-0.01	834.28

Source: Author's Calculation

There would be overall trade creation for India and EU but Rest of the world would be negatively impacted with trade diversion as the tariff on light manufacturing goes down by 50%.

CONCLUSION

The signing of an agreement on free trade between the two partners requires a substantial change in the tariff structure especially for India as the tax structure is still quite high. There is also a need for more structural adjustment for both the parties involved. For India, EU is a major trade partner. The biggest impact of such an agreement would be on agricultural and heavy manufacturing sector as they have the highest level of protection.

These sectors are therefore likely to be more resistant to tariff reductions under an FTA. India and EU can customize this FTA according to their need as it is not mandatory to include all the goods and services under its purview and WTO uses the term "substantially all trade" be covered. Service sector liberalization is more difficult and complex, largely due to socio- political factors within India. India EU free trade agreement may result in negative impacts on India's neighboursif the EU captures markets in India that displace exports from India's poorer neighbouring countries [trade diversion].

Reduction in flexibility in public policy

The free trade agreement between India and Europe would lead to gradual opening of sensitive sectors and would also limit the probability of encouraging new sectors in the future as part of a strategy for economic development. India would not be able to alter its tax structure once the FTA came into effect. EU also

imposes a '*standstill clause*' that restricts the partners from increasing the tariffs even on products listed on the sensitive list. But on the other hand India would be benefitted from this tax liberalization where the cheap input imports would lead to lesser average cost for the industry. The small and medium enterprises, facing a high cost structure, would be the affected in a positive way.Along with an array of fundamental issues, the impact of agreement on exports and imports of both the partners need to be analyzed in conjunction with the effects of restrictions imposed by government regulations that accompany the EU''s FTA . The study concludes that the proposed agreement on free trade may push India into a discomfort zone in the short run; India would eventually rebalance the gains from growth by devising appropriate diffusion mechanism.India should try to enter into an agreement where its sovereignty is not jeopardized.

It is also argued that with the FTAs like the Trans Pacific Partnership (TPP) between 12 major players coming in to force, Indian exports would suffer considerably as these 12 countries together account for more than 50% of global GDP. So India EU FTA could act as a shield from such mega FTAs as it could diminish India's export losses. But signing of an FTA would not assure that it is going to act as a hedging tool against the other major FTAs. Whether India will gain from this agreement depends on the nature of the FTA signed between them. The agreement has become important for both the parties. In order to recover its falling exports, India desperately needs a preferential access to the European market. India's exports to the EU fell by around 4.5% in 2014-15. Not only India needs a partner, EU also requires greater access to the Indian market because of the economic slowdown in Europe.

Europe has time and again demanded lowering of tariff on European automobiles and wines and spirits. Though this may result in increasing trade volume between the two partners but it could aggravate India's balance of payment crisis by increasing its imports. EU would get an access to a larger market than India. India's export might not increase significantly if tariff are cut for all the sectors as EU already has very low tariff rates for almost all products except textiles and fisheries.

Areas of concern

India faces the real challenge from the non tariff barriers imposed by EU on Indian exports. These measures include sanitary and phytosanitary measures, and technical barriers to trade. They have led to restrictions on Indian exports to Europe. A perfect example is the restrictions on the export of Alphonso mangoes imposed by EU few years back.India has to negotiate the clauses of the agreement in such a way that EU promises for liberalising trade in services especially for the supply of services in what are known as 'modes 1 and 4'.

Under the General Agreement on Trade in Services (WTO) Mode 1 concerned with outsourcing of legal processes, knowledge and business processes. There is a huge opportunity for India to create job in these areas if EU is legally committed to outsource these activities. Mode 4 is concerned with temporary labour mobility. Liberalisation under mode 4 would lead to increase in remittances from European Union to India as more and more Indian labour may now have a preferential access to its labour market. But as European Union is already facing high rates of unemployment because of the financial crises, one is not sure to what extent it is going to allow for such clauses.

Another area of major disagreement is of intellectual property (IP). India is expected to implement stringent IP protection standards which are beyond the WTO specified standards. India cannot agree with

these standards as it could harm its public health system. The developed countries are using the FTAs as a tool to negotiate IP standards according to their needs.

Recommendations

Internal reforms needed

As the negotiations at WTO are stalled India is forced to play the FTA game with European Union so as to reap the benefit of International Trade. The interest of India can only be protected if it is able to negotiate a balanced treaty with European Union. There is also a need to introduce comprehensive structural and legal reforms in the form of comprehensive goods and services tax. If these reforms are overlooked, Indian goods and services would not become globally competitive to reap the benefits of a balanced FTA signed by both the parties.

Developmental issues to be addressed

Both the parties should treat development as the focal point for all free trade discussions. The social commitments should take the front seat and commercial interests could follow.They should give each other time for impact assessment of the FTA on society. These negotiations should be made transparent and unambiguous and the shareholders should be made aware of the implementation processes. It is difficult to convince the stakeholders of the merits of this agreement if the development issue is left unattended.

REFERENCES

Acharya, A., &Dayal, K, Tan, L. (2014), Modeling of slow time-scale behavior of fast molecular dynamic systems. *Journal of the Mechanics and Physics of Solids*, *64*, 24-43.

Aguiar, A., Narayanan, B., & McDougall, R. (2016), An overview of the GTAP 9 data base. *Journal of Global Economic Analysis*, *1*(1), 181-208.

Armington, Paul, (1969), "A Theory of Demand for Products Distinguished by Place of Production", International Monetary Fund Staff Papers, XVI (1969), 159-78

Arrow, Kenneth J. and Debreu, Gerard (1954), 'Existence of an Equilibrium for a Competitive Economy', Econometrica 22: 265-90.

Bach, C. F., & Martin, W. (2001), Would the right tariff aggregator for policy analysis please stand up?. *Journal of Policy Modeling*, *23*(6), 621-635.

Baier, S. L., Bergstrand, J. H., Egger, P., & McLaughlin, P. A. (2008), Do economic integration agreements actually work? Issues in understanding the causes and consequences of the growth of regionalism. World Economy, 31(4), 461-497.

Bovenberg and Smulders, (1995), Environmental Quality and Pollution Saving Technological Change in a Two-sector Endogenous Growth Model, Journal of Public Economics, 57: 369- 391.

Bovenberg, A. L., & Goulder, L. H. (2002), Environmental taxation and regulation. *Handbook of public economics*, *3*, 1471-1545.

Burnett, P., Cutler, H., & Thresher, R. (2007), The impact of tourism for a small city: a CGE approach. *Journal of Regional Analysis and Policy*, *37*(3), 233-242.

Carneiro, F. G., &Arbache, J. S. (2003), The impacts of trade on the Brazilian labor market: a CGE model approach. *World Development*, *31*(9), 1581-1595.

Cadot, O., Carrère, C., De Melo, J., &Tumurchudur, B. (2006), Product-specific rules of origin in EU and US preferential trading arrangements: an assessment. *World Trade Review*, *5*(02), 199-224.

Dai, H., Masui, T., Matsuoka, Y., & Fujimori, S. (2011), Assessment of China's climate commitment and non-fossil energy plan towards 2020 using hybrid AIM/CGE model. *Energy Policy*, *39*(5), 2875-2887.

Elliott, J., I. Foster, S. Kortum, T. Munson, F.P. Cervantes, and D. Weisbach. (2010), "Trade and Carbon Taxes." The American Economic Review, 100(2): 465–469. http: //www.jstor.org/stable/27805040.

Gunning, J. W., &Keyzer, M. A. (1995), Applied general equilibrium models for policy analysis. *Handbook of development economics*, *3*, 2025-2107.

Hertel, T., D. Hummels, and T. Walmsley. (2013), "Developing a Multi-region Input Output Framework from GTAP for Analyzing the Vulnerability of the AsiaPacific Supply Chain to Natural Disasters." http://www.gtap.agecon.purdue. edu/resources/resdisplay.asp?RecordID=4140.

Magee, C. S. (2008), New measures of trade creation and trade diversion. *Journal of International Economics*, *75*(2), 349-362.

Narayan, P. K. (2004), Economic impact of tourism on Fiji's economy: empirical evidence from the computable general equilibrium model. *Tourism Economics*, *10*(4), 419-433

Panagariya, A. (2000), Preferential trade liberalization: the traditional theory and new developments. *Journal of Economic literature*, *38*(2), 287-331.

Romalis, J. (2007), Market access, openness and growth .NBER Working Paper # 13048.

Santos Silva, Joao M.C. and Silvana Tenreyro (2006), The log of gravity, Review of Economics and Statistics 88, 641-658.

Thierfelder, K., and S. McDonald. (2012), "Globe v1: A SAM Based Global CGE Model using GTAP Data." United States Naval Academy Department of Economics, Departmental Working Papers No. 39, Dec. https:// ideas.repec.org/p/ usn/usnawp/39.html.

Ukkusuri, S.V., R. Mesa-Arango, B. Narayanan, A.M. Sadri, and X. Qian. (2016), "Evolution of the Commonwealth Trade Network." International Trade Working Paper 2016/07, Commonwealth Secretariat, London.doi:http://dx.doi.org/ 10.14217/5jm3mbfw26jg-en. http://www.oecd-ilibrary. org/commonwealth/trade/evolution-of-the-commonwealth-trade-network 5jm3mbfw26jg-en.

Weyant, J. (ed) (1999), 'The Costs of the Kyoto Protocol: A Multi-Model Evaluation', The Energy Journal, Special Issue.