ECO Regional Integration Impacts on Labor Market of Member Countries

Abdollah Mahmoodi

Faculty of Social Science, Mahabad Branch, Islamic Azad University, Mahabad, IRAN

Corresponding author's Email: mahmoodi_a2000@yahoo.com

ABSTRACT: This study assesses the impact of ECO regional integration on labor market variables in ECO member countries. The role of regional trade agreements in rising of demand for endowments and their prices is the debate of many economists. Empirical literature does not address this issue for ECO. This paper uses global trade analysis project (GTAP) modeling approach to simulate cut of trade barriers between ECO members. Using a multi-region, multi-commodity GTAP modeling, simulation results show that, trade policy reform improved ECO members' economic performance, by means of higher endowment demand.

Key words: ECO, Trade Liberalization, Labor Demand

INTRODUCTION

Regional trade agreements have prevailed since 1990s; as of 2013, some 546 notifications of RTAs have been received by WTO. What all RTAs in WTO have in common is that they are reciprocal trade agreements between two or more partners. Most of these bilateral and multilateral agreements are between neighboring countries.

ECO involves seven Asian and three Eurasia countries, which provides a platform for discussing ways to improve development and promote trade, and investment. The main objective is to establish a market for goods and services.

The organization's population and labor force are more than 417 and, 130 million (ECO Statistics, 2013), respectively, which is one of the important labor markets in the world. Based on the economic situation, there are many countries such as Afghanistan with low income (per capita income of US $ 650 in 2010); and Turkey with medium to high income (per capita income is about US $ 10000 in 2010). Also, there are countries with a high source of oil and natural gas such as Iran, Azerbaijan and Turkmenistan and those which need to import these resources of energy, like Turkey, Pakistan and Afghanistan. There is a country like Turkey which has ranked 24th among the world's industrialized countries. Iran has a good educated human resource; on the other side, Afghanistan does not have a good situation in this regard. Therefore, these differences between ten neighbor countries, represents an important opportunity for multilateral trade of goods and services to improve economic and welfare situation of all countries of the region.

Although ECO has a long history, its economic integration is not strong. Because of ECO members have political links with other political blocks in the world, many of which could be against each other; political integrity is a strong barrier for the inter-ECO integration. Inter-regional trade shows that each ECO member's trade share is insignificant relative to the country's whole international trade (Haeryan, 2007). However, Afghanistan, Tajikistan, and Uzbekistan's ratio of inter-ECO to whole international trade is 51, 50 and 22 percent, respectively; but, this ratio was only 5.1, 6.4 and 6.7 in 2010 for other important countries such as Iran, Turkey and Pakistan, respectively. Therefore, there is an insignificant international trade inside ECO region and more important trade partners do their exports and imports to the rest of the world countries (ECO Statistics, 2013).

ECO members have high potential and many opportunities to link their economy to each other. In order to be successful in developing the members' relationship, it is necessary to consider each member's needs and capabilities. In this large area, there are countries which need to buy energy resources while others in the same region export this kind of commodity. There are countries which need to buy education and health services, investment in educational and transportation infrastructures; on the other side, other countries have specialty in producing and exporting this kind of goods and services. In sum, ECO members have the essential basis to promote inter-regional transactions and represent better performance of their agreement.

Many studies have been conducted to recognize advantages of ECO agreement and its impacts on economic development of ECO members (Shahabi and Shiekholeslami, 2010), trade development (Hoseini and Aqheli, 2007), organizational extend (Haeryan, 2007), lack of trade development in ECO (Jalali and Solaimani, 2007), elasticity of markets in

ECO countries (Hoseini and Aqheli, 2007) and other aspects. Kulaei and Movaddab (2007) believed that lack of political convergence between ECO members was the main cause of lack of economic integration. Hoseini and Aqeli (2006) argued that inelasticity of ECO members' markets for imports was the main reason for non-extension of multilateral trade between ECO members. Adeli and Elahi (2006) found that weakness of transportation infrastructures was the main reason for this low ratio of inter-ECO trade. However, Haeryan (2007) showed that between-members' trade expansion had a positive impact on national production of most countries.

This study intended to investigate impacts of trade promotion by means of reducing trade barriers on labor market variables of ECO members. It aimed to illustrate whether trade barrier cuts could increase demand for endowments and their prices.

MATERIALS AND METHODS

International trade has impacts on economic variables such as international transportation services, uses of imported intermediate commodities, imported commodities for domestic household consumption, national and international saving and investment, goods and services market, production factors, balance of payments, and many other socio-economic variables. These effects could be predicted by general equilibrium models, which are convenient for international trade policy simulations. Using a multi-region GE model, international trade effects on domestic and trade partners' economy variables could be reflected. This study used GE approach, which had some advantages compared to econometric models. It accounted for accounting relationship of economic variables, which would be affected by policy shocks.

Trade policy refers to trade policy reforms as reduction or removal of international trade barriers. In other words, trade policy is changes in trade tariffs and quotas, except health and religious filters for tradable commodities. In most studies, except cuts in trade quotas for investigating their impacts on in question variables, researchers use reduction in tariffs as a proxy to reduce all trade barriers. This study used trade tariff reduction as a trade policy reform in ECO regional trade integration.

This study used a GTAP model (Appendix A) to investigate effects of trade policy shocks. To describe effects of trade policy reform on labor market variables, mathematical structure of this model was used. To start with, consider cuts in bilateral import tariffs of commodity i from r to s [tms(i,r,s)] region. This variable decreases market prices [pms(i,r,s)] via price linkage en5. Domestic users substitute cheaper imports according to en7. Also, composite price of imports facing sector j consequently falls via en6 and en4. The demand for imports will rise via en9. Cheaper imports will decrease composite price of intermediate commodities via en9, which will increase profits at current prices via en3, and expends output, which generates an expansion effect via en11 and en12. This issue will increase the demand for production factors via en10, which increases the demand for mobile endowments via en2 and consequently raises the price of these endowments and transmits the shock to other sectors in the liberalizing region.

In r region, production of goods will increase, because import tariffs are reduced. En7 is then used to determine implication of total sales of i from r to s region. En1 dictates subsequent implications of total output [qo(i,r)]. Production behavior equations come into play, by en11 and en12 transmitting the expansion effect back to demand for intermediate commodities and to region r's factor markets.

Two en18 and en19 describe responsiveness of imperfectly mobile endowments of production to changes in the rental rates associated with those sectors in which these sluggish endowments are employed. En18 introduces a price index and en19 determines transformation relationships.

To complete the global economic system, macroeconomic closure needs to be determined. Here, determinants of aggregate investment must be discussed. The GTAP model does not account for macroeconomic and monetary policies, which are the factors that explain aggregate investment. Also, because this model is neither an inter-temporal model nor sequenced through time, it does not affect productive capacity of industries/regions in the model. However, reallocation of investment across regions will affect production and trade through its effects on final demand. There are four common methods for basic indeterminacy of investment in comparative static models; only in the fourth closure, investment is permitted to adjust; however, rather than including an independent investment relationship, it simply accommodates any change in savings.

Moreover, to adopt a closure rule to investment, potential changes in the current account need to be considered. It is common to force domestic savings and investment to move in tandem by fixing the current account balance. To understand this issue, it is useful to recall accounting identity of $S - I \equiv X - M$, which shows that national savings (S) minus investment (I) is equal to the current account surplus (S is derived as a residual). By fixing the X - M side, the difference between S and I will be fixed, which may be accomplished in the GTAP framework by fixing the trade balance [DTBAL(r) = 0, en46] and freeing up either S (en 14) or I.

If S = I in the initial equilibrium, then $S - I = 0$; and, thus $X - M = 0$ (provided cif/fob margins are accounted for in exports). Furthermore, by fixing $X - M = 0$ on a regional basis, each region's share in the global net of S is fixed. In this way, equality of global S and I in the new equilibrium is also assured. Causality in identity runs from left to right side.

Once S - I is permitted to adjust, the global bank is needed to ensure that the global demand for S equals the global demand for I in the post-solution equilibrium. The global bank in the GTAP model uses receipts from sale of S commodity to

the individual regional households in order to purchase (at price PSAVE) shares in a portfolio of regional I goods. However, on a regional basis, some adjustment in the mix of I is permitted; thereby, another dimension is added to determine I in the model.

Policy simulation

To show impacts of the ECO regional integration on ECO members' labor market, it is necessary to remove/reduce trade barriers. To simplify this, trade tariffs was reduced as a proxy for trade barrier reduction as it is a common approach in trade policy simulations. Here 10% reduction in power of tariffs occurred between ECO members: reduction in tariffs (variable of tms in GTAP model) of imported commodity "i" from all ECO regions (r = ECO region) to all ECO regions (s = ECO region). 57 commodities in GTAPAgg were aggregated in 6 new commodity groups. Impacts of this trade policy reform on ECO region's trade and macroeconomic variables were investigated. Because there were not economic data on four ECO member countries of Afghanistan, Tajikistan, Uzbekistan and Turkmenistan their policy simulation effects were not computed. The solution method was the Gragg's multi-step method, which produced more accurate results than Johansen's method.

The simulation involved a bilateral cut of power of tariffs of ECO imports on ECO all commodity products, tms(all trade commodities, ECO, ECO) = -10%, which implied cut of 10% in power of the ad-valorem tariffs that amounted to 10% cut in domestic price of ECO exports to ECO.

RESULTS

Model results are shown below. The experiment results demonstrated that bilateral import tariffs' reduction (by 10%) decreased market price of all imported commodities in all ECO countries, which was more than that of other countries in Azerbaijan and Kirgizstan. Reduction was predictable in import prices, because ECO countries reduced import tariffs of commodities, which they imported from other ECO members (Table 1).

Price of composite commodity increased in all ECO members. Cheaper imports resulted in the substitution of composite imports for domestic commodity and also increased the demand for imports in the composite intermediate good (qim). The trade barrier cuts in all ECO countries increased the demand for imports to produce more exportable goods and also increased the demand for endowments (except natural resource in all ECO countries except Iran and land in all countries except Azerbaijan). Therefore, production of all ECO members increased and hence the export and imports.

All ECO members' increased imports were due to three substitution effects on production and consumption, income effect on imported commodities, expansion effects on production of goods for exports and domestic consumption. All of these effects could be seen in (1) increased imports of intermediate goods [variable qfm(i,j,s)] by production sectors in an ECO member country; (2) between sectoral movement of mobile endowments; and (3) changes in using sluggish endowments' quantities in increased production of some production sectors. For example, table (2) shows that it was the same for Iran and other countries.

Table 1. Impact of 10% reduction in power of trade tariffs on trade variables of ECO and ROW

Region	Sect / Variab	GrCrLiFoF	OilGaCoMi	PrFodTex	LightMnfc	HeavyMnfc	SerTraUtiC	Land	Lab	Capital	NatRes	DTBAL
Azar	pim[a]	-4.9	-7.7	-3.6	-2.0	-1.7	-0.4					
	pm[b]	0.2	0.6	-0.4	0.63	0.32	0.38	-4.2	2.6	2.9	-3.1	
	qim[c]	10.7	9.42	4.45	1.51	3.36	2.35					
	Px_ir[d]	0.19	0.6	-0.35	0.63	0.32	0.38					
	qxw[e]	13.7	-5.2	10.6	2.1	31.1	1.4					
	DTBALi	-13	-178	-11	-12	174	-57					-96
Iran	Pim	-0.5	-0.2	-0.9	-0.4	-0.6	-0.6					
	Pm	0.4	0.7	0.3	0.03	0.46	0.49	0.7	0.6	0.6	1.0	
	Qd	2.1	3.9	2.56	1.01	1.61	2.12					
	Px_ir	0.42	0.71	0.33	0.03	0.46	0.49					
	Qxw	3.5	0.7	5.0	9.6	0.9	0.1					
	DTBALi	13	458	-34	-38	-400	-38					-38
Kaz	Pim	-0.7	0.0	-0.3	-0.5	-0.5	-0.3					
	Pm	0.9	0.4	0.7	0.48	0.54	0.93	3.8	1.3	1.3	-1.5	
	Qd	4.2	1.88	2.14	1.44	2.36	2.14					
	Px_ir	0.87	0.36	0.7	0.48	0.54	0.93					
	Qxw	4.3	-0.6	8.5	4.3	4.5	-0.6					
	DTBALi	36	-48	-16	-57	67	-93					-112

Region	Varia											Total
Kyrg	Pim	-4.5	-7.0	-1.8	-1.6	-2.9	-0.2					
	Pm	2.7	-3.6	1.0	0.46	1.04	1.82	3.5	4.4	4.3	-29	
	Qd	20.7	3.56	2.6	2.71	6.27	3.69					
	Px_ir	2.73	-3.62	0.98	0.46	1.04	1.82					
	Qxw	-2.5	101.6	11.0	13.8	2.3	2.3					
	DTBALi	-6	-4	-7	-4	-24	10					-35
Pak	Pim	-0.4	-1.0	-0.2	-0.1	-0.2	-0.1					
	Pm	0.4	-0.7	0.3	0.22	-0.07	0.35	0.4	0.5	0.5	-2.9	
	Qd	1.86	0.57	1.24	0.7	0.43	0.85					
	Px_ir	0.36	-0.7	0.31	0.22	-0.07	0.35					
	Qxw	1.2	9.5	0.4	0.5	3.1	-0.8					
	DTBALi	-18	-28	48	-17	-28	-65					-108
Turk	Pim	-0.4	-2.4	-0.5	0.0	-0.1	-0.1					
	Pm	0.4	-0.9	0.4	0.34	0.01	0.5	-0.9	0.6	0.7	-5.3	
	Qd	1.64	3.08	1.75	1.01	0.71	1.25					
	Px_ir	0.39	-0.85	0.42	0.34	0.01	0.5					
	Qxw	-1.5	15.1	-1.3	0.5	4.4	-1.5					
	DTBALi	-91	-355	-319	-75	640	-294					-496
ROW	Pm	0.0	0.0	0.0	-0.01	0	-0.01	0.0	0.0	0.0	0.2	
	Qim	-0.0	-0.09	-0.03	-0.01	-0.01	-0.02					
	Px_ir	-0.0	0.04	-0.01	-0.01	0	-0.01					
	Qxw	0.0	0.0	0.0	0.0	0.0	0.0					
	DTBALi	72	245	341	185	-552	593					883

a. pim = market price of composite import i in region r
b. pm = market price of commodity i in region r
c. qim = aggregate imports of i in region s, market price weights
d. px_ir = export price index for good i and region r
e. qxw = aggregate exports of i from region r, FOB weights
f. DTBALi = change in trade balance by i and by r, $ US million

Table 2: Impact of 10% reduction in power of trade tariffs on demand for endowments and, domestically produced and imported intermediate production factors in Iran

Region	Sect / Varia	GrCrLiFoF	OilGaCoMi	PrFodTex	LightMnfc	HeavyMnfc	SerTraUtiC
GrCrLiFoFi	qf[a]	0.03	0.06	-0.18	-0.05	-1.02	0.06
	qfd[b]	-0.6	-1.75	-0.38	-0.19	-1.94	-0.45
	qfm[c]	1.83	0.65	2.05	2.24	0.45	1.98
OilGaCoMir	Qf	0.03	0.06	-0.18	-0.05	-1.02	0.06
	Qfd	-0.04	-0.5	-3.87	-3.14	-1.11	-0.43
	Qfm	5.12	4.63	1.09	1.86	3.99	4.7
PrFodTexWa	Qf	0.03	0.06	-0.18	-0.05	-1.02	0.06
	Qfd	-0.77	-1.09	-1.46	-0.98	-3.52	-0.44
	Qfm	2.63	2.31	1.92	2.42	-0.21	2.98
LightMnfc	Qf	0.03	0.06	-0.18	-0.05	-1.02	0.06
	Qfd	-0.21	-0.58	-0.73	-0.8	-1.44	-0.26
	Qfm	1.19	0.82	0.67	0.6	-0.05	1.14
HeavyMnfc	Qf	0.03	0.06	-0.18	-0.05	-1.02	0.06
	Qfd	-1.45	-2.44	-1.79	-2.67	-2.74	-0.85
	Qfm	2.15	1.13	1.8	0.89	0.82	2.77
SerTraUtiCon	Qf	0.03	0.06	-0.18	-0.05	-1.02	0.06
	Qfd	0.01	0.01	-0.2	-0.08	-1.09	-0.01
	Qfm	2.18	2.18	1.97	2.09	1.06	2.16
Land	Qfe	0	0.05	-0.13	-0.08	-0.51	-0.03
Labor	Qfe	0.03	0.08	-0.17	-0.04	-1.01	0.07
Capital	Qfe	0.03	0.08	-0.18	-0.05	-1.02	0.05
NatRes	Qfe	0	0	0	0	0	0
Value added	Qva	0.03	0.06	-0.18	-0.05	-1.02	0.06

CONCLUSION

Using a GTAP modeling approach, this study aimed to investigate implementation of the ECO trade agreement. This integration has not been studied using GTAP model, which is special for international trade. In this study, ECO convergence was done using this model and removal of trade barriers was simulated. The endogenous variables, on which this study soughs to evaluate the impact of trade policy reform, were demand for endowments and intermediate production factors and their prices. The scenario of 10% reduction in power of trade tariffs from ECO country members to the same destination countries showed that trade liberalization decreased import prices and increased quantity and value of imports. The increased imports originated from exports of other ECO countries; therefore, exports of other ECO members increased. Increases in exports needed more domestic production, which in turn required more primary and intermediate production factors. Increased prices of some primary production factors demonstrated that the demand for them had increased. Demand for intermediate commodities was formed by two sides. The demand for imports of intermediate commodity was due to consumption and production substitution effects, the consumption income effect, and the production expansion effect. All of these effects increased demand for imports; so inter-regions export must be increased to finance increased imports. In addition, increased use of production factors and their increased prices increased household income and thus household consumption in private and public sectors.

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APPENDIX A: GTAP model equations

1. $VOM_{ir} * qo_{ir} = \text{VDM}_{ir} * \text{qds}_{ir} + \text{VST}_{ir} * \text{qst}_{ir} + \sum_{s\varepsilon REG} VXMD_{irs} * qxs_{irs} + VOM_{ir} * tradslack_{ir}$,
   $\forall i\varepsilon TRAD, \forall r\varepsilon REG.$

2. $VOM_{ir} * qo_{ir} = \text{VOM}_{ir} * \text{endwslack}_{ir} + \sum_{j\varepsilon PROD} VFM_{ijr} * qfe_{ijr}, \forall i\varepsilon ENDWM, \forall r\varepsilon REG.$

3. $VOA_{jr} * ps_{jr} = \sum_{i\varepsilon ENDW} VFA_{ijr} * pfe_{ijr} + \sum_{i\varepsilon TRAD} VFA_{ijr} * pf_{ijr} + VOA_{jr} * profitslack_{jr}$,
   $\forall j\varepsilon PROD, \forall r\varepsilon REG$

4. $pfm_{ijr} = tfm_{ijr} + pim_{ijr}.$ $\forall i\varepsilon TRAD$ و$\forall j\varepsilon PROD$ و$\forall r\varepsilon REG.$

5. $pms_{ijr} = tm_{ijr} + tms_{ijr} + pcif_{ijr},$ $\forall i\varepsilon TRAD, \forall j\varepsilon PROD, \forall r\varepsilon REG.$

6. $pim_{is} = \sum_{k\varepsilon REG} MSHRS_{iks} * pms_{iks}, \forall i\varepsilon TRAD, \forall s\varepsilon REG.$

7. $qxs_{irs} = qim_{is} - \sigma_{M_i} * [\text{pms}_{irs} - \text{pim}_{is}], \forall i\varepsilon TRAD, \forall r\varepsilon REG, \forall s\varepsilon REG,$

8. $pf_{ijr} = FMSHR_{ijr} * pfm_{ijr} + [1 - FMSHR_{ijr}] * pfd_{ijr,}$ $\forall i\varepsilon TRAD, \forall j\varepsilon PROD, \forall r\varepsilon REG,$

9. $qfm_{ijs} = qf_{ijs} - \sigma D_i * [pfm_{ijs} - pf_{ijs}], \forall i\varepsilon TRAD$ و$\forall j\varepsilon PROD$ و$\forall s\varepsilon REG.$

Value added Nest:

10. $qfe_{ijr} + afe_{ijr} = qva_{ir} - \sigma VA_j * [pfe_{ijr} - afe_{ijr} - pva_{jr}],$
    $\forall i\varepsilon ENDW, \forall j\varepsilon PROD, \forall r\varepsilon REG,$

Total production Nest:

11. $qva_{jr} + ava_{jr} = qo_{jr} - ao_{ji}, \forall j\varepsilon PROD, \forall r\varepsilon REG$

12. $qf_{ijr} + af_{ijr} = qo_{jr} - ao_{jr}, \forall j\varepsilon PROD, \forall r\varepsilon REG,$

Zero Profit

Total Utility:

13. $INCOME_r * u_r = PRIVEXP_r * up_r + GOVEXP_r * [ug_r - pop_r)] + SAVE_r * [qsave_r - pop_r], \forall r\varepsilon REG$

Regional Saving:

14. $qsave_r = y_r - psave + saveslack_r, \forall r\varepsilon REG,$

Composite Demand:

15. $qp_{ir} = \sum_{k\varepsilon TRAD} EP_{ikr} * PP_{kr} + EY_{ir} * [yp_r - pop_r] + pop_r, \forall i\varepsilon TRAD, \forall r\varepsilon REG,$

16. $pm_{ir} = \sum_{k\varepsilon PROD\_COMM} REVSHR_{ikr} * pmes_{ikr}, \forall i\varepsilon ENDWS, \forall r\varepsilon REG$

17. $qoes_{ijr} = qo_{ir} - endwslack_{ir} + \sigma T_i * [pm_{ir} - pmes_{ijr}], \forall i\varepsilon ENDWS, \forall j\varepsilon PROD, \forall r\varepsilon REG,$