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Regional Integration in East Asia and Its Impacts on Welfare and Sectoral Output in Vietnam

To Minh Thu*

Abstract

The economic impacts of some current and hypothetical regional FTAs on Vietnam's welfare and sectoral output are assessed using a dynamic computable general equilibrium (CGE) model. Trade facilitation and endogenously determined sectoral productivity, which are part of the liberalization process, are incorporated into the model. The results show marginal gains of welfare for Vietnam and other members of FTAs. Welfare gains for Vietnam, as well as for some other ASEAN countries, are highest under the ASEAN-China FTA. The results also reveal the importance of liberalizing the rice sector. When rice is excluded from trade liberalization, welfare gains of rice exporting and importing countries fall significantly. At the sectoral level, Vietnam's manufacturing sectors expand thanks to an increase in the output of textiles, garment, leather products and machinery. Agricultural production would expand if rice is liberalized, but would contract otherwise.

Keywords: Regional integration, FTA, Vietnam, East Asia, CGE model

JEL Classification: F13, F15

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1. Introduction

Over the last two decades, Vietnam's trade reform has been undertaken in a multi-pronged process of unilateral, bilateral and regional liberalization. Unilateral removal of trade barriers has been a continuous process that helps bring down the level of protection closer to those of other developing countries, creating a more transparent, rule-based administrative system of trade. At the same time, bilateral trade agreements with major trading partners, such as the US, the EU and Japan, were sought to open new opportunities for Vietnamese goods to enter these important markets. These proactive moves have changed the trade regime of Vietnam dramatically, resulting in continuous and high growth of the trade sector.

Despite a high share of trade with East Asia, Vietnam's trade commitments with the East Asian economies have mainly been within the ASEAN framework. In the mid-1990s, Vietnam joined ASEAN and became a member of the ASEAN Free Trade Area (AFTA). As ASEAN progresses with new trade and economic cooperation arrangements, notably with China, Japan, Korea, Australia and New Zealand and India, Vietnam has been part of this regional cooperation framework.

Unlike WTO where concession is made on an MFN basis, regional FTAs are discriminating against nonmembers and could cause welfare loss for some members and most non-members. Even within the group, members are open to the same opportunities and face competition among them, making theoretical assessment of the ultimate economy-wide effects impossible.

By means of a dynamic computable general equilibrium (CGE) model, this paper analyzes the effects of different regional trade arrangements between ASEAN and partner countries on economic welfare and sectoral output of Vietnam. Following the introduction, section 2 looks at key features of trading arrangements between ASEAN and its major trading partners. Section 3 reviews some theoretical arguments on FTAs and previous studies on East Asian FTAs. Section 4 describes the model and simulation scenarios. Section 5 presents the results and provides some interpretations. The last section concludes with policy recommendation.

2. East Asia trade and cooperation

For several decades, ASEAN countries have been successful in sustaining high economic growth through expansion of trade and attraction of FDI. During the period 1965-1995, the original member of ASEAN recorded average growth rate of more than 7%.¹⁾ Together with high growing Northeast Asian economies, Singapore, Indonesia, Malaysia and Thailand were named by the World Bank as the high-performing Asian economies (HPAEs).²⁾ During the period 1998-2008, despite the adverse impacts of the financial crisis, the rate of economic growth of the group was 5.3%, which was significantly higher than the world average. In the same period, average annual growth of exports rose at 14.2% while its imports increased at 17.5% per annum.

Table 1 shows the share of ASEAN trade with its major trading partners. Intra-ASEAN trade,

1) Except for the Philippines which suffered stagnant during the 1980s (Lau and Park, 2003).

2) The HPAEs are often referred to the 8 high performing East Asian economies, namely Japan, Korea, Hong Kong, Taiwan, Singapore, Malaysia, Indonesia, and Thailand (World Bank, 1993).

Table 1. ASEAN trade by selected partner country/region

Partner country/region	Share of the total ASEAN trade			
	2000	2003	2006	2008
ASEAN	22.0	25.1	25.1	26.8
Japan	15.3	13.8	11.5	12.4
China	4.3	7.2	10.0	11.3
European Union (EU-25)	13.5	12.3	11.4	11.8
USA	16.1	14.3	11.5	10.6
Republic of Korea	3.9	4.1	3.7	4.4
Australia and New Zealand	2.6	2.7	2.9	3.4
India	1.3	1.5	2.0	2.8
Others	21.0	12.6	21.8	16.5
Total ASEAN+3	45.5	50.1	50.3	54.9
Total	100.0	100.0	100.0	100.0

Source: Calculated from data in *ASEAN Statistical Yearbook 2008*.

which is on the rise,³⁾ accounts for about a quarter of regional trade. This means that about 75% of ASEAN trade is directed outside ASEAN. Adding three East Asian countries (China, Japan and Korea), intra-regional trade share increases to more than 50%. In 2008, ASEAN+3 countries accounted for 53.2% of ASEAN exports and 56.6% of its imports. These shares are below that of European Union-15 which exceeds 60% but exceed that of NAFTA, which peaked at 49% in 2001 (ASEAN, 2008).

Linkages in FDI are also strong in the region. During the period 2000-2008, ASEAN received about US\$342.7 billion of FDI inflows, of which 34.5% came from East Asia, 27.0% from the EU countries and 10.1% from the US. This trade and investment linkages have been a major force for economic cooperation in the region. In addition, the need for regional cooperation became more urgent after the 1997's economic crisis. East Asian countries realized that maintaining regional dynamism would require economic policy cooperation among them, in addition to policy efforts at the national level. With AFTA framework, ASEAN became a catalyst for shared prosperity in the region. From 2001, ASEAN has embarked on free trade agreements with major trading partner, including China, Japan, Korea and Australia and New Zealand. These trading partners, whilst generally seen as competitors, recognise that there is mutual interest that could be realised with ASEAN.

Table 2 summarizes the main features of some FTAs of ASEAN with its partners that will be considered in this paper. The list of FTAs in East Asia goes much longer. However, in this paper, we only considered those that are expected to have significant impacts on Vietnam.

In order to ensure effectiveness of the different FTAs, ASEAN has taken great care to avoid creating a "spaghetti bowl" of rules, particularly on rules of origin, which would confuse private sector. To the extent possible, it has advocated for the extension of rules that are currently in effects in AFTA so that the private sector could enjoy the same benefits under the FTA. The most ambitious ASEAN+3 FTA, once completed, would solve this problem, bring significant benefit to all members and secure ASEAN's linkages with all East Asian economies (Cordenillo, 2005).

3) This ratio increase from 22.0% in 2000 to 26.8% in 2008

Table 2. Selected information on regional FTAs covered in this study

Agreements	Members	Specific status	Implementation schedule
AFTA	ASEAN-10	- Signed in January 2002 - Under implementation	- 2010 for ASEAN-6 - 2015 for CLMV
ASEAN-China FTA	PRC and ASEAN-10	- Signed in 2002. - Under implementation-	- 2010 for China and ASEAN6 - 2015 for CLMV
ASEAN-Japan FTA	Japan and ASEAN-10	- Signed in Oct 2003 - Under implementation from December 2008	- 2010 for Japan - 2012 for ASEAN-6 - 2018 for CLMV
ASEAN-Korea FTA	Korea and ASEAN 9 (except Thailand)	- Signed in May 2006. - Under implementation from July 2006	- 2008 for Korea (90% of products) - 2010 for ASEAN-6 and 2016 for Vietnam, - 2018 for CLM.
ASEAN+3 FTA	ASEAN-10 and China, Japan, Korea	- Under proposal	- Not yet specified

3. Literature survey of CGE studies of East Asia's regional integration

Impacts of East Asian regional integration have been the topics of a large number of studies (e.g. Brown et al., 2003; Dee, 2007; Lee et al. 2004; Park, 2006; Scollay and Gillbert, 2001; Urata and Kiyota, 2005; Zhang et al., 2006). Most of empirical studies make use of the currently available global CGE models such as GTAP model of Purdue University, CPEIT's MIRAGE model and the LINKAGE model of the World Bank. The range of scenario is diverse, including all present and hypothetical FTAs in the regions, such as AFTA, ASEAN-CER, ASEAN-India, ASEAN-China, ASEAN-Japan, ASEAN-Korea, ASEAN+3, ASEAN+4, ASEAN+6 and China-Japan-Korea. Percentage change in welfare (or welfare per capita) and change in GDP and output are the most commonly used variables in empirical studies. From previous studies, it is generally found that FTA members would benefit from regional integration while non-members may suffer welfare loss. Total world welfare would see some insignificant increase. In terms of percentage change in welfare or GDP, gains for ASEAN countries and Korea are found to be generally larger than that for China and Japan. Using GTAP simulations, Urata and Kiyota (2003) indicates that ASEAN+3 will generate 12.5% gain in welfare for Thailand and 6.6% gain for Vietnam, while that for China and Japan is only 0.64% and 0.16% respectively. The same pattern is found in Zhang et al (2006), Kawai Wignaraja (2007), among others. The gain in absolute terms, however, is usually higher for China, Japan and Korea due to the size of their economies (Ando and Urata, 2006; Lee and van der Mensbrugghe, 2008; Plummer and Wignaraja, 2007; Tsutsumi and Kiyota, 2000; Zhang et al., 2006).

Comparing the impacts of different FTA arrangements using the same model, it is commonly agreed that the larger the size of the FTA, the more benefits it brings to the member economies, but also the higher the cost for non-members. These findings are expected because the benefits from improvements in resource allocation tend to increase with the size of the grouping without

trade barriers. Lee, Choi and Park (2003) and Tsutsumi and Kiyota, (2000) find welfare gain for ASEAN to increase significantly in ASEAN+3, compared with AFTA. Kawai and Wignajawa (2007), which provide income effects of ASEAN+1, ASEAN+3 and ASEAN+6 for almost all single economies in East Asia found that the gain for member countries increase with number of countries in the FTAs. The income effects for ASEAN improve from the 3.72% in ASEAN-China FTA⁴⁾ to 5.23% in ASEAN+3 FTA and to 5.66% in ASEAN+6 FTA. The effects on Northeast Asia rise from less than 0.3% in all ASEAN+1 FTAs to 1.85% in ASEAN+3 and 1.93% in ASEAN+6 FTA.

The focus on sectoral trade and production of previous studies is found in some studies. Urata and Kiyota (2005) provide changes in real outputs and real exports of member countries in East Asian FTA scenario. Their study indicates that sectors with comparative advantage increase outputs and those with strong protection increase exports. The later result is explained by the shift of incentive from domestic sales to export sales in the protected sectors. In another direction, Lee and van der Mensbrugghe (2008) relate RCA rankings of commodities with various FTA scenarios and those with the global trade liberalization to examine how “natural” each grouping would be. Their results show that ASEAN+3 with relatively large welfare gains and small structural adjustments would be a facilitating intermediate step towards global free trade.

Some studies focus on impacts on specific countries. Major economic players in regional FTAs such as China, Japan, Korea, Thailand and Singapore attract most of the attention. However, studies on impacts of regional trade agreements on small trading country like Vietnam have been very few. Some CGE studies have taken them as a separate region but without focus on the rationales behind the simulated impacts as well as results at the sectoral level. In this paper, we hope to fill in the gap by providing an analysis for the impact of East Asian regional trade integration on Vietnam in a dynamic CGE model. We focus on welfare changes at regional level and also changes in sectoral outputs for Vietnam, which would be more important for policy formulation purpose.

4. Model description and scenarios

4.1. Model description⁵⁾

The model used in this study, known as the LINKAGE model, is a dynamic global CGE model developed by van der Mensbrugghe (2005) and recently used in Lee and van der Mensbrugghe (2008). It spans the period 2001-2015.

In this paper, the full trade liberalization scenario is examined, in which starting from the year 2010 tariffs among FTA member countries are reduced gradually to reach 0% in the year 2015. The model takes into account impacts of trade facilitation, such as customs harmonization.

The model distinguishes between four trade prices. First, producers receive price PE for exported goods. Second, the FOB price, WPE , includes domestic export taxes or subsidies. Third, the CIF price, WPM , includes the international trade and transport margin, represented by the ad valorem wedge ζ , as well as a non-monetary or frictional trade cost, represented by the iceberg parameter

4) The effects of ASEAN-Japan and ASEAN-Korea FTAs are 2.34% and 0.66%, respectively.

5) For detailed description of the model, see van der Mensbrugghe (2005)

λ . Thus the relationship between the FOB price and the CIF price is given by

$$WPM_{r,r',i} = (1 + \zeta_{r,r',i}) WPE_{r,r',i} / \lambda_{r,r',i} \quad (1)$$

where subscripts r , r' , and i denote exporting region/country, importing region/country, and commodity, respectively. Finally, the domestic price of imports, PM , is equal to the CIF price, WPM , plus tariffs (or tariff-equivalent). In our model, an increase in $\lambda_{r,r',i}$ represents a reduction in trade-related risks, lower administrative barriers to trade (e.g. customs procedures) and/or a fall in technical barriers. In other words, trade facilitation increase the value of $\lambda_{r,r',i}$.

Most of the data used in the model come from the GTAP database, version 6, which provides 2001 data on input-output, value added, final demand, bilateral trade, tax and subsidy data for 87 regions and 57 sectors.⁶⁾ For the purpose of the present study, the database is aggregated into 12 regions and 17 sectors as shown in Table 3.

Table 3. Regional and sectoral aggregation

A. Regional aggregation

Country/region	Corresponding economies/regions in the GTAP database
Vietnam	Vietnam
Singapore	Singapore
ASEAN-4	Indonesia, Malaysia, Philippines, Thailand
Other ASEAN	Brunei, Cambodia, Lao PDR, Myanmar
China	China and Hong Kong
Japan	Japan
Korea	Korea
Taiwan	Taiwan
Australia	Australia
United States	United States
European Union	Austria, Belgium, Denmark, Finland, France, Germany, Great Britain, Greece, Ireland, Italy, Luxembourg, Netherlands, Portugal, Spain, Sweden, plus 12 new member countries since 2004
Rest of world	All the other economies/regions

B. Sectoral aggregation

Sector	Corresponding commodities/sectors in the GTAP database
Rice	Paddy rice, processed rice
Other agriculture	Wheat, other grains, vegetables and fruits, oil seeds, sugar cane and sugar beet, plant-based fibers, crops nec, livestock, raw milk, wool, forestry
Minerals	Minerals, mineral products, coal, gas and coal products
Crude oil	Oil
Fishing	Fishing
Food products	Food products, meat products nec, vegetable oils and fats, dairy products, sugar, food products nec, beverages and tobacco products
Textiles and apparel	Textiles, wearing apparel, leather products
Wood and paper	Wood products, paper products and publishing
Chemical products	Chemical, rubber and plastic products

6) See Dimaranan (2006) for detailed description of the GTAP database, version 6.

Petroleum products	Petroleum products
Metals	Iron and steel, nonferrous metal, fabricated metal products
Transportation equipment	Transportation equipment
Machinery	Machinery and equipment, electronic equipment
Other manufactures	Manufactures nec
Construction and utilities	Construction, electricity, gas distribution, water
Trade and transport Services	Trade, sea transport, air transport, transport nec Financial services, business services, defense, education, health services, other services

Note: nec = not elsewhere classified.

4.2. The baseline scenario

To evaluate the effect of Vietnam's unilateral trade liberalization, we first establish a baseline, which show the path of each economy over the period 2001-2015 in the absence of trade liberalization. Population and labor force growth are exogenous and driven by UN-based assumption. Labor force growth is equal to the growth of the working age population (15-64). Capital accumulation depends on savings, investment and depreciation. Real GDP growth rates over the period 2001-2015 in the baseline are broadly consistent with the World Bank's GDP forecast. We assume that the trade and transport margin declines by 1% per annum in every country/region.

Several assumptions underline the calibration of productivity. Agricultural productivity is fixed in the baseline using results from previous studies. Sectoral productivity in non-agricultural sector is composed of 3 components: a uniform economy-wide factor that is calibrated to achieve the driven GDP target, a sector-specific factor related to openness, and a constant shifter. The sector-specific factor intended to capture openness-sensitive changes in productivity $\chi_{i,t}$, is given by

$$\chi_{i,t} = \phi_{i,t} \left(\frac{E_{i,t}}{X_{i,t}} \right)^{\eta_i} \quad (2)$$

where $E_{i,t}$ is exports of commodity i , $X_{i,t}$ is output of commodity i , $\phi_{i,t}$ is a shift parameter, and η_i is the elasticity of productivity with respect to openness. $\phi_{i,t}$ is calibrated in the baseline scenario so that the trade-sensitivity portion of sectoral productivity is some share of total productivity.

4.3. Policy scenarios

In this paper, we consider six policy scenarios, representing five regional FTAs and a Global trade liberalization scenario. Details of the policy scenarios considered are as follows:

1. ASEAN Free Trade Area (AFTA): Free trade among the ASEAN countries
2. ASEAN-China FTA (ASNCHN): Free trade among the ASEAN countries and China
3. ASEAN-Japan FTA (ASNJPN): Free trade among the ASEAN countries and Japan
4. ASEAN-Korea FTA (ASNKOR): Free trade among the ASEAN countries and Korea
5. ASEAN+3 FTA (ASNPLS3): Free trade among the ASEAN countries, China, Japan and Korea
6. Global trade liberalization (GTL): Complete abolition of import tariffs and export subsidies.

For all policy scenarios, two experiments are performed. In the first one, called “exrice”, rice is excluded from liberalization. The reason is that Japan and Korea have been strongly resisted liberalizing this politically sensitive sector in all FTAs that they have signed so far. It is very unlikely that Japan and Korea would enter a region-wide FTA involving the rice sector. To bring out impacts of trade liberalization in the rice sector, we undertake the second experiment, called “inrice”, in which all sectors are included in the liberalization process.

In each experiment, we gradually remove bilateral tariffs and export subsidies/taxes of all liberalizing sectors among the member countries over the 2010-2015 period. We set the elasticities of productivity with respect to openness, η_i , equal to 0.5 and 1.0 in agriculture and all other sectors, respectively. We assume that frictional trade costs (e.g. administrative barriers and trade-related risks) would be reduced by 2.5% in all FTA scenarios and the GTL scenario.

5. Results

5.1. Welfare effects of FTAs

Welfare effects of the six trade liberalization scenarios are presented in terms of deviations in equivalent variations (EV) from the baseline in 2015. The numbers in the table are highlighted when a country is a member of the FTA being analyzed. Table 4 shows the results of the experiments in which rice is excluded from tariff liberalization process.

Table 4. Effects on welfare resulting from regional trade liberalization
(% deviations in equivalent variations from the baseline in 2015)

Region	AFTA	ASNCHN	ASNJPN	ASNKOR	ASNPLS3	GTL
Vietnam	0.40	1.99	0.11	-0.47	1.38	2.47
Singapore	3.43	2.66	2.46	1.95	2.32	4.36
ASEAN-4	1.12	1.01	1.03	0.53	0.62	1.90
Other ASEAN	0.18	0.18	0.15	0.04	0.28	0.46
China	-0.04	0.65	-0.09	-0.06	1.31	1.52
Japan	-0.01	-0.05	0.17	-0.02	0.41	0.62
Korea	-0.04	-0.18	-0.11	0.43	2.51	3.40
Taiwan	-0.06	-0.22	-0.14	-0.09	-0.54	2.19
Australia	-0.04	-0.05	-0.06	-0.05	-0.16	1.70
United States	0.00	-0.01	-0.01	0.00	-0.03	0.68
EU	0.00	-0.01	-0.01	0.00	-0.02	2.01
ROW	-0.01	-0.02	-0.02	-0.02	-0.06	1.60
ASEAN+3	0.13	0.30	0.18	0.08	0.90	1.29
World	0.02	0.05	0.03	0.01	0.16	1.32

Note: Rice is not liberalized in any of the scenarios.

The results show that regional FTAs are beneficial for member countries while imposing costs to non-members. Apart from the global free trade (GTL) scenario, the ASEAN+3 FTA would result in the highest gain for the ASEAN+3 region as a whole (an increase of 0.9% from the baseline scenario). Among all regions, Singapore's welfare gain is the largest in terms of percentage deviations from the baseline in all scenarios. This result may be surprising at first since Singapore's initial tar-

iffs are all zero, except for alcoholic beverages and tobacco (which are aggregated into food products), so direct benefit to consumers is expected to be small. However, the ability to increase exports and thus production could be the main drive leading to welfare gains. In addition, as Lee et al. (2009) pointed out, the use of the Armington assumption in this model created strong terms of trade effects, which in this case lead to increase in terms of trade for Singapore, while worsen that of other ASEAN countries.

Vietnam's welfare improves in five out of six scenarios. Highest welfare gain is found from ASEAN-China FTA (1.99%) compared with 1.38% gains from ASEAN+3 FTA. In ASEAN-Korea FTA, Vietnam's welfare falls by 0.47%. This unexpected consequences stems from two major reasons. First, Vietnam's initial tariff rates are on average significantly higher than those of Korea, causing its terms of trade to deteriorate under this scenario. Second, the initial trade share of Vietnam with Korea is much smaller than that with Japan or China, so that the potential gain from increases in intra-FTA trade is not large enough to offset the terms of trade loss.

The simulation results shows that for some ASEAN countries (Vietnam, Singapore and ASEAN-4), welfare gains in ASEAN-China FTA are greater than ASEAN+3 FTA.⁷⁾ This is not a surprising result because China is the largest importer in Asia and the largest market for most of Asian exporters. China's fast growth would require a large volume of imports of resources, materials, intermediate goods from ASEAN, thereby bringing ASEAN new opportunities to increase its exports. During the period 2001-2015, projected GDP growth rate of China is much larger than any regional countries, making China a momentum for regional growth. Under Asean+3 FTA, Japan and Korea's exports to China will also increase significantly. Hence the increase in ASEAN's exports to China will be smaller than in ASEAN-China FTA scenario.

The discriminatory nature of regional FTA is obvious when considering the gain and loss of other regions. China, Japan and Korea's welfare improves when they are members of an FTA and worsens when they are non-members. Therefore, there is strong incentive for these countries to facilitate FTAs with ASEAN. When the ASEAN+3 FTA is realized, the gains are highest for all these three countries.

Among the non-members, Taiwan is affected most by FTAs in East Asia with welfare decreases by 0.54% in ASEAN+3 FTA scenario. Being part of East Asia, the Taiwanese economy is closely linked with all ASEAN+3 countries. The ASEAN+3 FTA is likely to divert trade from Taiwan to other member countries, causing significant loss to Taiwan. Since it is politically infeasible to be included in ASEAN+3, Taiwan will need to pursue separate FTAs with each of its important partners to reduce the extent of the possible losses.

Welfare of the US and the EU decreases slightly in all FTA scenarios. Although the loss is insignificant, it may still pose economic reason for these countries to worry about East Asia regionalism. For the world as a whole, East Asia's regional integration brings limited welfare gain. The outcome is understandable because in any FTA scenario, welfare improvement of member countries is al-

7) Chu and Huang (2008) assert that ASEAN will benefit more from ASEAN-China FTA, at least initially. Cordenillo (2005) shows that ASEAN-China FTA will increase ASEAN's exports to China by 48% and China's exports to ASEAN by 55.1%. This internal trade will increase ASEANS' real GDP by 0.9% (US\$5.4 billion) and China's real GDP by 0.3% (US\$2.2 billion).

most balanced by welfare loss of non-members.

5.2. Welfare effects of FTA accords when rice is included

As mentioned above, for Japan and Korea rice is considered as a very sensitive commodity for trade liberalization and it is excluded from their current FTAs. It is, however, of interest to see how free trade of this sector could affect the economic welfare of the region. The issue is important for rice-exporting countries, including Vietnam.

Table 5 presents outcome of welfare changes in all scenarios when rice is included in liberalizing sectors. Comparing with Table 4, the costs of excluding rice, in terms of percent reductions in welfare gains, are found to be highest in Vietnam in all scenarios. In absolute terms, however, the cost for Japan is largest, at US\$8.5 billion in ASEAN-Japan FTA and US\$11.4 billion in ASEAN+3 FTA. ASEAN-4, which includes Thailand, also sees significant welfare loss when rice is excluded from liberalization. China is affected slightly in ASEAN+3 FTA. The effects on other region are found to be negligible.

Table 5. Effects on welfare resulting from regional trade liberalization
(% deviations in equivalent variations from the baseline in 2015)

Region	AFTA	ASNCHN	ASNJPN	ASNKOR	ASNPLS3	GTL
Vietnam	1.02	2.52	1.10	0.10	2.10	3.08
Singapore	3.45	2.67	2.43	1.94	2.31	4.35
ASEAN-4	1.14	1.03	1.31	0.63	0.77	2.17
Other ASEAN	0.19	0.18	0.15	0.05	0.28	0.47
China	-0.04	0.66	-0.09	-0.07	1.39	1.60
Japan	-0.01	-0.05	0.39	-0.02	0.69	0.98
Korea	-0.04	-0.18	-0.10	0.58	2.80	3.68
Taiwan	-0.07	-0.22	-0.14	-0.09	-0.54	2.19
Australia	-0.04	-0.05	-0.06	-0.05	-0.16	1.70
United States	0.00	-0.01	-0.01	0.00	-0.03	0.68
EU	0.00	-0.01	-0.01	0.00	-0.03	2.03
ROW	-0.01	-0.02	-0.02	-0.02	-0.06	1.60
World	0.03	0.05	0.06	0.02	0.21	1.37

Note: Rice is liberalized in all scenarios.

Rice plays important role in three FTA scenarios that include Japan and Korea. In ASEAN-Japan FTA including rice, welfare gain of Vietnam increased by 10 folds, from 0.11% to 1.1%, compared with the baseline scenario; ASEAN-4's gain rises from 1.03% to 1.31%, while that of Japan more than doubles (from 0.17% to 0.39%). In ASEAN-Korea FTA, when rice is traded freely, welfare change for Vietnam become positive, whereas ASEAN-4 and Korea's gains increase by 30% and 50%, respectively. In the ASEAN+3 FTA scenario, welfare of Japan, Korea, Vietnam and ASEAN-4 all improve significantly. It is undoubtedly that Japan and Korea's resistance to liberalize rice will hurt both rice exporters and their consumers substantially.

Comparison of some aggregate variables of Vietnam reveals interesting outcome. Table 6 shows that total export and import values are not affected much by the inclusion of rice in the liberalization agenda, even in ASEAN-Japan, ASEAN-Korea and ASEAN+3 FTAs. In contrast, output and

Table 6. Effects on some aggregate variables of Vietnam
(% deviations in equivalent variations from the baseline in 2015)

Region	AFTA	ASNCHN	ASNJPN	ASNKOR	ASNPLS3	GTL
<i>When rice is not liberalized</i>						
Export	12.24	21.81	18.05	19.80	29.31	44.98
Import	10.05	18.89	13.85	14.56	23.82	36.70
Output	1.29	4.27	2.86	3.29	5.84	9.40
Welfare	0.40	1.99	0.11	-0.47	1.38	2.47
<i>When rice is liberalized</i>						
Export	12.36	21.88	18.02	19.89	29.28	44.86
Import	10.51	19.27	14.47	14.98	24.27	37.01
Output	1.91	4.78	3.72	3.83	6.46	9.91
Welfare	1.02	2.52	1.10	0.10	2.10	3.08

welfare would improve significantly in all scenarios when rice is liberalized. The results of “inrice” experiment indicate that an increase in rice production will withdraw resources from other sectors, reducing output of all other sectors. The improvement in output and welfare thus results from a better allocation of resources. Distorted trade policy, in this case, would cause non-negligible loss of welfare.

5.3. Sectoral effects for Vietnam

The empirical results reveal that regional trade integration have strong impacts on many sectors in Vietnam. Some sectors find new opportunities to expand while others face competition and contract. In general, the direction of change is quite consistent across scenarios while the magnitude differs greatly.

Output changes for the 17 sectors in Vietnam in the six scenarios under consideration are presented in terms of percentage deviation from the baseline scenario. The two experiments *exrice* and *inrice* are shown separately in Tables 7 and 8. The biggest difference in the two tables is, of course, in the rice sector. When rice is not in the FTA agenda, its production contracts in all scenarios, especially in ASEAN+3 and GTL. Import and export of rice are also lower. However, when tariffs on rice are removed, Vietnam's export of rice goes up by about 100 % to as high as 184% in ASEAN-Japan FTA. Import also rises but at a much lesser extent, leading to significant expansion of production. Production of other agriculture, which likely competes with production of rice in term of resources, moves in the opposite direction. Putting together rice and other agriculture, production of the agricultural sector in Vietnam would depend greatly on whether rice is included in regional FTAs or not. Agriculture would expand in all scenarios (at 6.7% under the ASEAN+3 FTA) when rice is liberalized. Otherwise, in the more realistic case when rice is not liberalized, it contracts (at 2.7% under the ASEAN+3 FTA). Since agriculture employs more than half of the total labor force, this consequence of a contraction in agricultural output would adversely affects income of a large part of the population.

Impacts of the rice factor on other sector are not pronounced. In the following section, we only

Table 7. Vietnam's sectoral output changes from trade liberalization excluding rice
(% deviations in equivalent variations from the baseline in 2015)

	AFTA	ASNCHN	ASNJPN	ASNKOR	ASNPLS3	GTL
Rice	-4.73	-8.05	-5.52	-5.43	-9.54	-13.16
Other agriculture	4.96	9.44	2.35	2.09	5.94	-0.73
Fishing	-7.61	-7.19	-8.30	-8.24	-9.91	-14.92
Minerals	-1.01	1.83	-1.67	-1.25	0.32	-1.57
Crude oil	5.96	1.37	2.41	2.24	-1.33	-12.13
Food products	-18.62	-24.69	-18.79	-16.78	-27.57	-36.84
Textiles, apparel, leather	12.08	18.27	35.93	38.13	48.38	109.76
Wood and paper	0.57	1.44	1.14	1.09	0.74	1.71
Chemicals, rubber and plastics	4.65	130.46	4.90	4.99	108.47	90.98
Petroleum products	-3.86	-32.75	-5.85	-4.47	-32.90	-42.07
Metals	7.27	-0.23	0.93	1.40	-4.58	-12.79
Machinery	25.68	14.80	17.14	17.97	12.16	1.49
Transportation equipment	-6.75	-20.85	-11.74	-16.17	-21.86	5.05
Other manufactures	3.25	1.26	5.25	6.75	4.15	9.70
Construction and utilities	1.19	3.20	0.70	0.85	2.57	1.58
Trade and transport	4.28	9.87	4.87	5.72	10.34	11.01
Services	-1.14	-3.32	-2.13	-2.52	-4.25	-6.18
All sectors	1.29	4.27	2.86	3.29	5.84	9.40

Table 8. Vietnam's sectoral output changes from trade liberalization including rice
(% deviations in equivalent variations from the baseline in 2015)

	AFTA	ASNCHN	ASNJPN	ASNKOR	ASNPLS3	GTL
Rice	15.00	8.34	24.45	11.98	12.06	4.56
Other agriculture	-0.57	4.65	-5.37	-2.64	0.02	-5.23
Fishing	-7.93	-7.31	-8.95	-8.62	-10.25	-15.01
Minerals	-1.56	1.35	-2.49	-1.72	-0.28	-2.03
Crude oil	5.08	0.72	1.13	1.50	-2.14	-12.73
Food products	-19.79	-25.21	-21.17	-18.15	-28.87	-37.44
Textiles, apparel, leather	9.80	16.37	31.70	36.05	45.54	106.58
Wood and paper	-0.54	0.55	-0.62	0.12	-0.45	0.73
Chemicals, rubber and plastics	4.77	128.86	5.09	5.11	106.95	90.00
Petroleum products	-5.53	-33.69	-8.45	-5.96	-34.11	-42.87
Metals	5.37	-1.61	-1.88	-0.18	-6.36	-14.06
Machinery	23.84	13.51	14.43	16.48	10.43	0.33
Transportation equipment	-7.62	-21.60	-13.09	-16.95	-22.88	3.87
Other manufactures	1.90	0.20	2.96	5.47	2.58	8.27
Construction and utilities	1.03	3.05	0.45	0.71	2.38	1.44
Trade and transport	3.66	9.34	3.83	5.16	9.59	10.43
Services	-1.06	-3.25	-1.94	-2.44	-4.12	-6.08
All sectors	1.91	4.78	3.72	3.83	6.46	9.91

examine impacts of the “exrice” experiment. The simulation result shows a large contraction of food products in all scenarios compared with the baseline scenario (nearly 30% in the ASEAN+3 scenario). This is due to the relatively high initial level of protection in the food industry (World

Bank, 2003). In addition, Vietnam's food processing industry is relatively under-developed, especially compared with its neighboring China and ASEAN countries, making it hard to compete in both home and foreign markets. Despite being an exporter of agricultural products, most of Vietnam's agriculture exports are primary or just preliminary treated. It is hoped that with regional integration and increasing urbanization, there would be growing demand for quality, processed and packaged food from the domestic market of more than 80 million people. There is opportunity for Vietnam to develop the food industry, making use of domestically available primary input, labor and growing market. If this is realized, the impact of regional trade liberalization on the food processing industry may be reversed.

Petroleum is another sector with sharp drop in output (about 30% in ASEAN+3 FTA). However, since the current production of petroleum in Vietnam is very small (about US\$100 million), the simulated changes is negligible. In fact, as new oil refinery projects are being implemented, it is expected that by the year 2015, when these projects come into operation, the actual output would increase, not decrease.

Outputs of "Chemical, Rubber and Plastics" vary widely in different scenarios. Rubber is one of the main export items of Vietnam, of which the largest importer is China. It is the reason why production of this sector more than doubles in two FTAs that have China as a member.⁸⁾

The transport equipment sector is among key sectors in Vietnam's industrialization agenda and it is one of the sectors that would be affected most when regional FTAs are realized. This industry has been under protection shield for long time. With commitment international integration, the industry is expected to face tough competition from imported products. However, the opportunity for development is also higher with soaring domestic demand for transport equipments and lower tariff for intermediate parts. The simulation result shows exactly the same pattern with exports finding new opportunities to expand (although the change is very small in absolute term), imports increased. Domestic output falls with regional integration. Tough competition is strong from China, resulting in sharp reduction in output under the ASEAN+3 and ASEAN-China FTA scenarios. Since Japan and Korea have comparative advantage in transport equipment, while the ASEAN-4 countries have comparative advantage in transport equipment parts, Vietnam's output of this sector contracts significantly in other FTA scenarios as well.

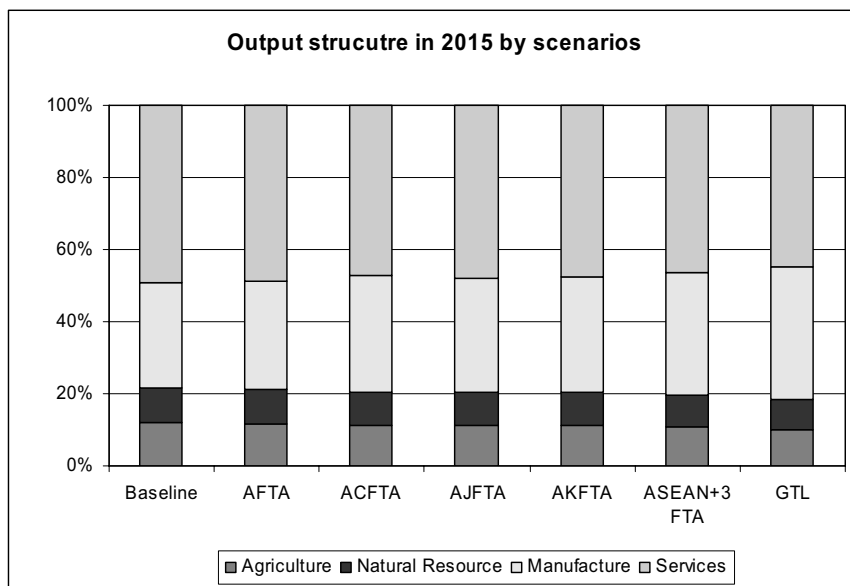
In general, output of the manufacturing sector as a whole increases. Although the expansion is plausible, highest growth occurs in low value-added textiles and apparel sector. Exports of textiles and apparel are expected to double in the GTL scenario from the baseline level. In regional FTA scenarios, especially AFTA and ASEAN-China, output growth is much lower. This is because major destination for Vietnam's textiles, garment and leather products are the EU and US. In addition, ASEAN and China are very competitive exporters in this sector so export growth in East Asian market is more limited. Exports and imports of textiles, garments and light manufacturing increase at approximately the same rate with production, revealing that production in this sector depends heavily on imported inputs and on foreign markets for its products. Value-added in this sector is

8) Export of this sector soars by about 300% in ASEAN-China FTA, 250% in ASEAN+3 FTA and around 200% in GTL.

low and its growth is vulnerable to external shocks.

Thanks to growth of light manufacturing, the share of manufacture in total output increase with trade liberalization. Among the FTA scenarios, under the ASEAN+3 FTA, Vietnam's production structure would be most comparable to that under global trade liberalization. Figure 1 shows an increase in the share of manufacturing sectors from 29% in the baseline scenario to 33.7% in the ASEAN+3 FTA and 40% in the GTL scenario. Agriculture and service sectors contract by 1.2% and 2.8% in ASEAN+3 and 1.9% and 3.6% in GTL scenarios. This sectoral adjustment is in line with Vietnam's objective of industrialization. However, there would be social cost associated with this process when agricultural sector contracts and a large number of agricultural workers are out of work. Development of light manufacturing will be just an intermediate step. To maintain growth impetus, diversification of manufacturing production from textiles, garment and leather products to production of food, machinery and transport equipment would be essential to increase value-added and to build up production capability and competitiveness.

Figure 1. Output structure of Vietnam in 2015



6. Summary and Conclusion

In this paper, a global dynamic computable general equilibrium model is used to analyze the impacts of some current and possible FTA arrangements in East Asia on aggregate welfare and sectoral output changes in Vietnam. Five FTAs, namely AFTA, ASEAN-China, ASEAN-Japan, ASEAN-Korea, ASEAN+3 and the Global Free Trade scenario are considered in this paper. Impact of trade facilitation and endogenous sectoral production growth is incorporated in the model. In each scenario, two experiments are performed: one in which the rice sector is left out and one in which all sectors, including rice, are liberalized.

The result reveals generally positive results for Vietnam and other FTA members. The size of gain for some regions (Vietnam, ASEAN-4, Japan and Korea) depends to a great extent on whether tariffs on rice are removed or not. Among the FTA arrangements, the ASEAN-China FTA would bring largest benefits to Vietnam, Singapore and ASEAN-4, while the ASEAN+3 FTA is the best for the three partners (China, Japan, Korea) and other ASEAN countries (Brunei, Laos, Cambodia and Myanmar). Non-members of FTAs are hurt by trade diversion impacts with Taiwan suffering the greatest loss. The impacts of East Asian FTAs on other region and the world as a whole are not significant.

In terms of sectoral production adjustments in Vietnam, the manufacturing sector gains with strong expansion of textiles, apparel and leather. The machinery sector also grows significantly in all regional FTAs but moderately in the GTL scenario. Among manufacturing sectors, transport equipment faces tough competition from other East Asian countries and as a consequence contracts under all FTA scenarios.

Special attention should be paid to the future of Vietnam's agriculture which is highly dependant on regional trade policies. For Vietnam, agriculture presents a major source of income and employment for many poor people. Whether this part of the population can benefit from the country's regional integration policy will be of crucial importance both socially and economically. The simulation results indicate that agricultural production would be hurt when rice is not included in the liberalization agenda. On the contrary, when tariffs on rice are removed, Vietnam's rice exports would be boosted, resulting in an increase in agricultural production as a whole.⁹⁾ We show that the cost of protecting the rice sector in Japan and Korea is also significant for these countries and would add more difficulties to the process of poverty reduction in the developing countries of the region.

It is obviously desirable for Vietnam to pursue regional trade integration. Apart from current AFTA and ASEAN+1 FTAs, benefits for Vietnam would be multiplied when the FTA becomes larger. At the sectoral level, a large FTA such as the ASEAN+3 FTA also leads to the structure closer to that of the global free trade scenario.

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