A CGE Analysis on Enhanced Trade Facilitation in a Northeast Asian Free Trade Agreement*

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Introduction

The Northeast Asian region had been characterized by the dearth of regionalism until late 1990s. In particular, the three major Northeast Asian countries   China, Japan, and Korea   had generally preferred multilateral trade liberalization approaches under the GATT and WTO regulations. In recent years, however, the region's policy stance has shifted from favoring multilateralism to regionalism. A turning point was the outbreak of the East Asian financial crisis occurred in 1997. The deepening interdependence among the Northeast Asian economies through regional trade and financial linkages can be another cause of the policy change. In addition, slow progress of multilateral negotiations under WTO and APEC has accelerated their shifting preference to regionalism. Recent developments in individual economies such as China's miraculous export-driven growth performance and entry into WTO, Japan's desire to regain its leadership role in the region, and Korea's regime change toward a more liberalized economic system can also be counted as factors behind the strategic change in the Northeast Asian commercial policy for regionalism.

Responding to the change of their position on commercial policy, this paper explores the effects of a possible Northeast Asian free trade agreement   FTA   between China, Japan and Korea. In this regard, one of the key concerns should be whether the

Northeast Asian FTA will raise trade and income among the three trade bloc members. Another important concern is whether the Northeast Asian FTA can help to achieve global free trade. We propose a strategic policy measure that will enable the Northeast Asian FTA to create trade and further promote free trade and economic integration at the global level. More specifically, we attempt to answer the following question: *what will be the most efficient way of building an FTA in a globalizing world economic order, especially for the three Northeast Asian countries?*[1] We strongly suggest that the FTA should stress trade facilitation rather than following common guidance on tariff reduction. As emphasized in Lee and Park 2005 , we believe that this method is more effective for integrating regional economies in a globalizing world economic environment because trade facilitation measures can be used to promote trade among countries in the region as well as between regions by drastically reducing the transaction costs incurred in the process of international trade. Furthermore, compared to tariff reduction among members, trade facilitation reduces the problems caused by the" spaghetti bowl phenomenon"[2] and makes it easier for members to open toward non-members, thereby satisfying APEC's commitment to" open regionalism." Relatively greater ease to include " substantially all trade" in the case of trade facilitation also satisfies Article XXIV of GATT.

However, contrary to the bulk of existing studies on the relationship between trade flows and tariffs, the trade facilitation effect has not been seriously investigated even though the trade facilitation has become a key agenda in multilateral trade talks in WTO and APEC and has been replacing the role of tariff reduction in many regional trade agreement RTA negotiations. In particular, the quantitative analyses of the economic effects at the aggregate macroeconomic level are still limited. In order to overcome the limitation, this study estimates the effect of trade liberalization efforts through tariff reduction and improved trade facilitation among the three countries on their macroeconomic variables and bilateral trade relations by using a computable general equilibrium CGE model analysis.

Following this introductory section, Section   briefly explains the theoretical relationship between trade facilitation, trade costs and gains from freer trade through trade facilitation. Section   also summarizes existing empirical studies on gains from

trade facilitation. In Section   , we specify the CGE model we adopt to quantify the impact of enhancing trade facilitation among the three Northeast Asian countries and evaluate the empirical results from the CGE analysis. Our findings are summarized in Section   .

Trade Facilitation: Theory and Practice[3]
Trade Facilitation, Trade Costs, and Trade Flows

Tariffs and non-tariff measures are barriers to international trade. The non-tariff measures can be classified as direct barriers e.g. import quotas and indirect barriers e.g. complex customs procedures . These barriers, along with transportation, insurance and other physical transaction costs, affect the price of domestically produced goods and imports, thereby restricting the flow of international transactions. The restrictions result in a loss of efficiency in terms of resource allocation, social welfare and economic development.

Trade facilitation can be defined as an effort to pursue greater 'convenience' in international trade through the simplification of economic activities such as the movement of goods and services across borders.[4] In a broad sense it can be defined as the lowering or elimination of non-tariff barriers. More specifically, it is an attempt to lower the costs of administration, standardization, technology, information, transaction, labor, communication, insurance, and financing, as well as to reduce the time costs related to these procedures. The administration costs arise during customs procedures, the technology costs are involved during standards procedures, and the information costs arise while importing or exporting goods and services. Those costs result in the loss of economic efficiency and reduce gains from trade.

Assuming that total costs related to international trade are equivalent to the price difference between world market price of imported goods and domestic consumer price, we can define this to be trade costs. In this context, trade costs can be divided into three categories. The first category is for transaction costs, consisting of transport and insurance costs. Second are policy costs, which are mainly incurred by protection policies like tariff and non-tariff barriers. Last are trade costs due to the lack of trade facilitation. That is, trade costs incurred by the movement of goods and services across borders can be defined as a sum of transaction costs, policy costs, and

facilitation costs. Therefore, the reduction in trade costs resulting from better trade facilitation has an identical effect as a reduction of tariffs or non-tariffs, both resulting in an increase in social welfare through the gains from freer trade.

More specifically, we apply the iceberg method, which is a traditional method of explaining transaction costs involved in international trade and derive the following equation.[5]

$$p_c = [\frac{(1+t)}{(1-\gamma)(1-\tau)}]\ p_w$$

In this equation, the p_w and p_c are world market price and domestic price of the imported goods, respectively, and t represents policy costs, where γ represents transaction costs and τ represents facilitation costs respectively. Let us assume that γ (0<γ<1) represents the percentage occupied by transport costs in a single unit of exportable and only (1-γ) arrives at the importing country. Then γ represents direct transaction costs. If we apply this iceberg method to define the trade costs related to trade facilitation, out of the (1-γ) of imports received, τ (0<τ<1) percent will additionally be discarded due to inefficient customs procedures in the importing country. Therefore, only (1-γ)(1-τ) of exportables will enter the domestic market. With these assumptions, we can interpret τ as the facilitation cost.

Therefore, according to the above-mentioned equation, trade facilitation improves the welfare of importing countries by narrowing the gap between the world market price (p_w) and domestic price (p_c) of the imported goods, leading to an increase in the volume of world trade. This implies that when τ is closer to 0, the difference between the two prices will narrow and therefore one can expect higher welfare gains.

The development of information and communication technology along with great efforts to liberalize trade has brought about a considerable reduction in transaction (γ) and policy (t) costs. At the same time, due to developments in information and communication technology, and increases in e-commerce as well as efforts to increase efficiency in customs procedures, facilitation costs (τ) have also fallen. However, this reduction in facilitation costs has been highlighted recently and is only a small fraction of the reduction in transaction and policy costs. It is believed that there is still plenty of room for additional reductions in facilitation costs, which can lead to a remarkable improvement in the world trade environment.

Existing Empirical Studies on Trade Facilitation

Four different methods of analyzing the effect of trade facilitation have been introduced. The most widely used method is an investigative analysis based on surveys. Aside from this, there are empirical analyses, which use gravity regression analysis, partial equilibrium model analysis, and CGE model analysis. The survey analysis is very useful but it is not very reliable to derive general effect of trade facilitation on trade flows in a global level and welfare in an aggregate level. The gravity regression analysis and partial equilibrium estimation use an ad-hoc and atheoretical specification of equations although the ex-post estimation technology practically produces very useful empirical results. On the other hand, CGE models are theoretically sound and are able to quantitatively analyze general effect on aggregated economy.[6]

Table 1 summarizes the existing empirical studies on the effect of trade facilitation based on the four different approaches. As shown in Table 1, we find that gains from trade facilitation are as beneficial as gains from tariff reduction. It is clear that trade facilitation reduces trade costs. In fact, there have been many attempts to analyze the cost reduction effect of trade facilitation. However, as evidenced through past experience, the identification and measurement of economic effects driven by trade facilitation is very limited and, in most cases, even impossible due to its cross-cutting and non-numeral nature. The results obtained in previous studies failed to take into account rapid developments in information and communication technology in recent years and the movement towards globalization after the establishment of the WTO. APEC 2002, OECD 2003 and Engman 2005 are some exceptions which have been developed to estimate a concrete macroeconomic impact of trade facilitation by using the CGE model simulation analysis. This paper is also a case study to quantify the concrete relationship between trade facilitation measures, trade costs, trade flows, and macroeconomic aggregates in the three Northeast Asian countries by using a CGE model.

Table 1. Existing Studies on the Economic Benefits of Trade Facilitation

A. Corroborated Analyses Based on Investigative Survey Method

Research	Itemized trade facilitation	Abstract of corroborated analysis
Cecchini (1998)	Non-tariff barriers like various restrictions and border restriction costs incurred by customs between EU members	● Trade cost is estimated to be 5% of total trade value ● Benefits from trade facilitation: 4.3-6.4% of the EU's total GDP
UNCTAD (1994)	Transaction costs incurred by trade facilitation	● 7-10% of total trade value
Schiavo-Campo (1999)	Japan's time cost for freight loading	● In the case of air freight, improved by 70% from 2.3 hours in 1991 to 0.7 hours in 1998
Schiavo-Campo (1999)	Philippine's time cost for freight loading	● From 6-8 days before implementing automation to 4-6 days after automation in the case of green lane, ● The reduction by 48 hours in the case of yellow and red lanes
OECD (2000)	The technology standard and approval regulations of telecommunication, dairy products, and car component industries in USA, Japan, UK, and Germany	● 0-10% increase in total production costs
APFC (2000)	In the case of the 21 APEC members, the qualitative analysis of customs procedures, standards and conformance, and mobility of business people	● Out of the previously mentioned 3 obstacles in facilitating trade, complex customs procedures and regulations are assessed to be the biggest problem equivalent to the tariff barriers.
APEC (2002)	The survey targeted APEC businesses engaged in trade with APEC economies to gather their views on the effects of trade facilitation on transaction costs in customs procedures, standards and conformity, and mobility of business people	● Most optimistic case: the reduced trade costs incurred by 50% improvement of trade facilitation will range from 5.8% in the case of industrialized APEC economies, 6.2% in the case of newly industrialized APEC economies, and 7.7% in the case of industrializing APEC economies.

B. Econometric Analyses Based on the Gravity Model

Research	Itemized trade facilitation	Abstract of corroborated analysis
Swann et al. (1996)[*]	Regression analysis to estimate trade creation effect of standardization in Britain between 1985 and 1991	● Imports increased by 34% and exports increased by 48%.
Moenius (1999)	Regression analysis to estimate trade creation effect of standardization in 12 countries between 1980 and 1995	● It is estimated that when the accumulated rate of standardization between all economies exceeds 1% of trade volume, total trade increases by 0.32%
Wilson et al. (2003)	Regression analysis to estimate trade creation effect of port efficiency, customs environment, own regulatory environment, and e-business usage in all the APEC economies between 1989 and 2000	● Assuming that APEC members below average improve trade facilitation halfway to the average for all members, the intra-APEC trade increases by $254 billion (approximately a 21% increase in intra-APEC trade flows) and the APEC average per capita GDP increases by 4.3%.
Kim, Lee and Park (2004)	For APEC, the effects of trade facilitation on imports in four areas: customs procedures, standards and conformity, mobility of business people, and e-commerce	● Improved trade facilitation by 10 percent boosts intra-APEC imports by 0.5 percent, 0.6 percent, 1.1 percent, and 1.5 percent in the area of customs procedures, information and communication technology, business mobility, and standard and conformance, respectively.
Kim and Park (2005)	For the three Northeast Asian countries, China, Japan and Korea, the effects of trade facilitation on imports in four areas: customs procedures, standards and conformity, mobility of business people, and e-commerce	● Evaluating the coefficients of explanatory variables representing trade facilitation indices, improved trade facilitation by 10 percent boosts the intra-regional import by a minimum 2.0 percent in the case of e-commerce and maximum 5.1 percent in the case of business mobility. In general, the trade creation effect of trade facilitation is much stronger than that of tariff reduction.
Wilson et al. (2005)	Regression analysis to estimate trade creation effect of port efficiency, customs environment, own regulatory environment, and service sector infrastructure in 75 countries for 2000 and 2001	● Assuming that below-average countries improve trade facilitation halfway to global average yields an increase in global trade of $377 billion.

C. Partial Equilibrium Analyses

Research	Itemized trade facilitation	Abstract of corroborated analysis
Thilmany and Barret (1997)[*]	Technology restrictions on US dairy products imported into NAFTA member economies	● Similar to the effect of tariffs, domestic consumers' welfare falls
Calvin and Krissoff (1988)[*]	Health restrictions on US apples imported into Japan	● Equivalent to the imposition of tariffs by 27.2%
Guasch and Spiller (1999)**	Monopolistic operation of harbors by Latin American economies and the regulations applied	● Equivalent to an export tax of 5-15%
Staples (1998)**	Paperwork for import customs	● An extra 7-10% costs on top of the world's total trade amount
WTO (2000)**	Transport restrictions when crossing borders between middle and eastern Europe	● 6% of total transportation time
Gasiorek et al. (1992)[*]	Standardization in the EU	● 2.5% reduction in trade costs
Harrison et al. (1996)[*]	Expansion of Gasiorek et al. (1992)'s research	● In the short run, the welfare gain is 0.5% of the GDP ● In the long run, due to the increase in ROI (Return on Investment), the welfare gain becomes 2.4% of the GDP
Kim, Lee and Park (2004)	Effect of three trade facilitation indices (customs procedures, standards and conformity, and mobility of business people) on bilateral trade between Korea, Japan, and China with a partial equilibrium analysis	● Considering the effect on bilateral trade with neighboring economies and the resulting effect on trade balance, improvement in customs procedures among the three economies is the most important area of trade facilitation for Korea and Japan. An improvement in standards and conformity and business mobility among the three economies is the most important areas of trade facilitation for China

D. CGE Model Analyses

Research	Itemized trade facilitation	Abstract of corroborated analysis
Dee (1998)	Trade facilitation brings about an increase in real income by 5% of the total trade	● For APEC as a whole, an increase in real income of US$216 billion.
APEC (1997)	Assumes that out of the APEC members industrialized economies will see a 2% fall in import prices and for less developed economies, a 3% drop	● For APEC as a whole, an increase in real income of US$45 billion (0.26% of the total GDP; in the case of tariff reductions, the increase in real income is 0.14% of the total GDP)
APEC (1999)	Assumes that out of the APEC members industrialized economies will see a 2% fall in import prices and less developed economies, a 3% drop	● For APEC as a whole, an increase in real income of US$46 billion (0.25% of the total GDP; in the case of tariff reductions, the increase in real income is 0.16% of the total GDP)
APEC (2002)	Measure the macroeconomic effects of trade facilitation on the APEC economy as a whole and on participating member economies	● Gains from trade facilitation are more beneficial to the APEC economy than gains from trade liberalization. ● The effect of the Shanghai Accord on APEC's GDP growth will be 0.98% (US$154 billion) ● The optimistic case of APEC's regional trade facilitation multiplies the beneficial effect on APEC's GDP by 1.3% (US$204 billion).
OECD (2003)	Effect of trade facilitation on trade transaction costs with GTAP Model	● 1% reduction of trade transaction costs for goods trade will create gains of $40 billion globally and more gains will be distributed to developing countries
Engman (2005)	Expansion of OECD works with GTAP for the analysis on the effect of trade facilitation, especially on trade flows, government revenue, and FDI	● Improved and simplified customs procedures create more trade, raise government revenue in developing countries, and even attract more FDI

Notes: * reproduced from Maskus, Wilson, and Otsuki (2001).
      ** reproduced from Messerlin and Zarrouk (2000).
Source: Compiled mainly based on APEC (2002), Wilson, Mann and Otsuki (2003, 2005), Kim, Lee and Park (2004), and Kim and Park (2005).

CGE Model Structure and Scenario Analysis

In this section, we attempt to estimate the macroeconomic effects of the possible Northeast Asian FTA through enhanced trade facilitation in the region with a traditional static CGE model. A trade-linked multi-sector and multi-country CGE model of the Asia Pacific is developed to measure the impact of the Northeast Asian regional economic integration effort on long-run economic growth and other important open macroeconomic variables in each participating economy   China, Japan and Korea.

CGE Model Structure

The CGE model used in this section retains the same structure as that used in the multi-sector and multi-region CGE model used by APEC   2002 , which is a modified version of the GTAP5inGAMS model developed by Rutherford and Paltsev   2000 . As seen in Tables 2 and 3, the present model uses a classification consisting of 20 sectors and 22 regions. The model has three economic agents: producer, representative consumer   private and public , and trading partners. As described in Rutherford and Paltsev   2000 , the GTAP5inGAMS model is a traditional static Arrow-Debreu type of equilibrium model in which the zero profit condition and the market clearance define the equilibrium. For the quantitative analysis of tariff reduction and trade facilitation in this research, we modify the bilateral trade relationship in the GTAP5inGAMS model. The original model defines two different trade costs, import tariffs   policy costs   and transportation costs applied on bilateral trade between countries and regions. Unfortunately, the model excludes any trade costs related to the quality of trade facilitation. We include the cost caused by the inefficient trade facilitation based on the iceberg method. Therefore, the consumer price of imports in a domestic market is determined by export price of the goods including export taxes, transportation costs from the country of origin to import country, import tariffs imposed on importables, and an iceberg type of facilitation costs. The structural specifications of the modified GTAP5inGAMS model[7] are summarized in Table 4.

The model solution is calibrated using 1997 as the base year by using Global Trade, Assistance and Production: The GTAP 5 Database[8] is implemented with the

Generalized Algebraic Modeling System   GAMS .[9]

Table 2. Regional Aggregation of the CGE Model

Regions		Countries
Asia-Pacific Economies	Northeast Asian 3 as an independent Economy in the model	China (CHN) Japan (JPN) Korea (KOR)
	Other Asia-Pacific Economies as an Independent economy in the model	Australia (AUS) Canada (CAN) Chile (CHL) Chinese Taipei (TWN) Former Soviet Union (XSU) Hong Kong, China (HKG) Indonesia (IDN) Malaysia (MYS) Mexico (MEX) New Zealand (NZL) Peru (PER) Philippines (PHL) Singapore (SGP) Thailand (THA) United States of America (USA) Vietnam (VNM)
Other Countries in America (LAT)	As a group of countries in the model	Central America and the Caribbean, Colombia, Venezuela, Rest of Andean Pact, Argentina, Brazil, Uruguay, Rest of South America
Western European Countries (WEU)	As a group of countries in the model	Austria, Belgium, Denmark, Finland, France, Germany, UK, Greece, Ireland, Italy, Luxemburg, Netherlands, Portugal, Spain, Sweden, Switzerland, Rest of EFTA
Rest of the World (ROW)	As a group of countries in the model	Bangladesh, India, Sri Lanka, Rest of South Asia, Hungary, Poland, Rest of Central Eastern European Association, Turkey, Rest of Middle East, Morocco, Rest of North Africa, Botswana, Rest of South African Customs Union, Malawi, Mozambique, Tanzania, Zambia, Zimbabwe, Rest of Southern Africa, Uganda, Rest of Sub Saharan Africa, Rest of World

Table 3. Sectoral Aggregation of the CGE Model

Sector	Commodities in the GTAP 5 Database
Agriculture (AGR)	Paddy rice, wheat, cereal grains nec., vegetables, fruit, nuts, oil seeds, sugar cane, sugar beet, plant-based fibers, crops nec., bovine cattle, sheep and goats, horses, animal products nec., raw milk, wool, silk-worm cocoons
Forestry (FRS)	Forestry
Fishery (FSH)	Fishing
Mining (MNG)	Coal, oil, gas, minerals nec.
Processed Food and Beverage (PFD)	Bovine meat products, meat products nec., vegetable oils and fats, dairy products, processed rice, sugar, food products nec., beverages and tobacco products
Textiles and Apparel (TXL)	Textiles, clothing apparel
Chemicals (CHM)	Petroleum, coal products, chemical, rubber, plastic products, mineral products nec.
Metals (MTL)	Ferrous metals, metals nec., metal products
Transport Equipment (TRN)	Motor vehicles and parts, transport equipment nec.
Other Machinery and Equipment (OME)	Electronic equipment, machinery and equipment nec.
Other Manufacturing (OMF)	Leather products, wood products, paper products, publishing manufactures nec.
Electricity, Gas, and Water (EGW)	Electricity, gas manufacture, distribution water
Construction (CNS)	Construction
Trade (TRD)	Trade
Transport (TSP)	Transport nec., water transport, air transport
Communication (CMN)	Communication
Finance, Insurance, and Business Services (FAB)	Financial services nec., insurance, business services nec.
Other Private Services (OSP)	Recreational and other services, dwellings
Other Government Services (OSG)	Public administration, defense, education, health
Investment (CGD)	Investment composite

Table 4. Characteristics of the CGE Model

Consumption:
- A representative household (both private and government-owned) maximizes its utility (Cobb-Douglas utility function) from demands for composite goods (domestically produced and imported under Armington aggregation) subject to its budget.
- The representative household's budget constraint (income) is adjusted to satisfy the macro-closure rule (total savings equal total investments).

Production:
- A representative producer produces two types of commodities, one for domestic markets and another for export markets. These two goods are joint products and distributed with an infinite elasticity of transformation between domestic and export markets.
- The producer combines four exogenously given endowment factor inputs – land, labor, capital, and natural resources – and intermediate commodities to produce outputs
- An assumption of perfect competition market determines the quantity of output supplied to each commodity market by the zero profit condition (unit cost function).
- The firms' minimizing cost of production determines input demands for intermediate goods and endowment factors subject to their technology.
- Leontief-type production technology (fixed input-output coefficients) determines the input demands for intermediate commodities. The intermediate demand is divided into two different sources, imported and domestic goods as imperfect substitutes, following Armington. The cost minimization process with a Cobb-Douglas production function determines activity level and factor input demands.

Trade:
- Each independent economy and other regions in the model determine their import demand by country of origin under Armington Assumption in order to minimize CES expenditure function subject to the given total import volume.
- The import price of commodity i is determined by two different sets of variables, exogenously determined policy variables (export tax rates, unit transport cost coefficient, import tariff rates, and efficiency coefficient of trade facilitation) and market determined endogenous variables (export prices and the value of transport services employed). The domestic consumer price of imported commodity i from country s to country r is defined as the following equation:

$$P_{i,r}^{M} = \sum_{s} [P_{i,s}^{X}(1+t_{i,s,r}^{X})+\tau_{i,s,r}V_{i,s,r}^{T}]\ (1+t_{i,s,r}^{M})\ (1-tf_{i,s,r}^{M})$$

where

$P_{i,r}^{M}$	import price of commodity i in country r
$P_{i,s}^{X}$	export price of commodity i in country s
$t_{i,s,r}^{X}$	export tax
$\tau_{i,s,r}$	unit transport cost coefficient of commodity i from country s to r
$V_{i,s,r}^{T}$	value of transport services in commodity i from country s to country r
$t_{i,s,r}^{M}$	import tariffs imposed on commodity i imported from country s to country r
$tf_{i,s,r}^{M}$	efficiency coefficient representing gains from enhanced trade facilitation in commodity i imported from country s to country r; $tf_{i,s,r}^{M} = 0$ for the base solution.

Scenarios

Four simulation analyses are designed to evaluate the possible gains or losses from the three Northeast Asian countries' effort to achieve a freer and easier trade through tariff reduction and trade facilitation in the region. For tariff reduction, we assume a 50-percent reduction of import tariffs between member economies in the region because it is not reasonable to assume a perfect elimination of import tariffs at the beginning stage of the trade liberalization.[10] We assume three different types of the Northeast Asian efforts for trade facilitation, conditional, unconditional and global, satisfying the APEC's Shanghai Accord[11] as shown in Figure 1.

Northeast Asian Three Free Trade Area NEFTA : A 50-percent reduction of import tariff rates by the three Northeast Asian member countries against imports from its members.

Shanghai Accord through Conditional Trade Facilitation CSA : A 5-percent reduction of trade facilitation costs only between the three Northeast Asian countries.

Shanghai Accord through Unconditional Trade Facilitation UCSA : A 5-percent reduction of trade facilitation costs in each of the three Northeast Asian countries for its trade with all the other countries in the model.

Shanghai Accord through Global Trade Facilitation GSA : A 5-percent reduction of trade facilitation costs between each of the three Northeast Asian countries and all the other APEC economies in the model.

For the benchmark equilibrium values, the base solution of the model economy, we run the CGE model without changing its initial condition and derive general equilibrium values for each of the countries in the model. As a next step, we rerun the model under different scenarios and recalculate the equilibrium values for each case. Then we compare the different equilibrium values with the initial base solution to evaluate the experimental impacts of each scenario on each country.

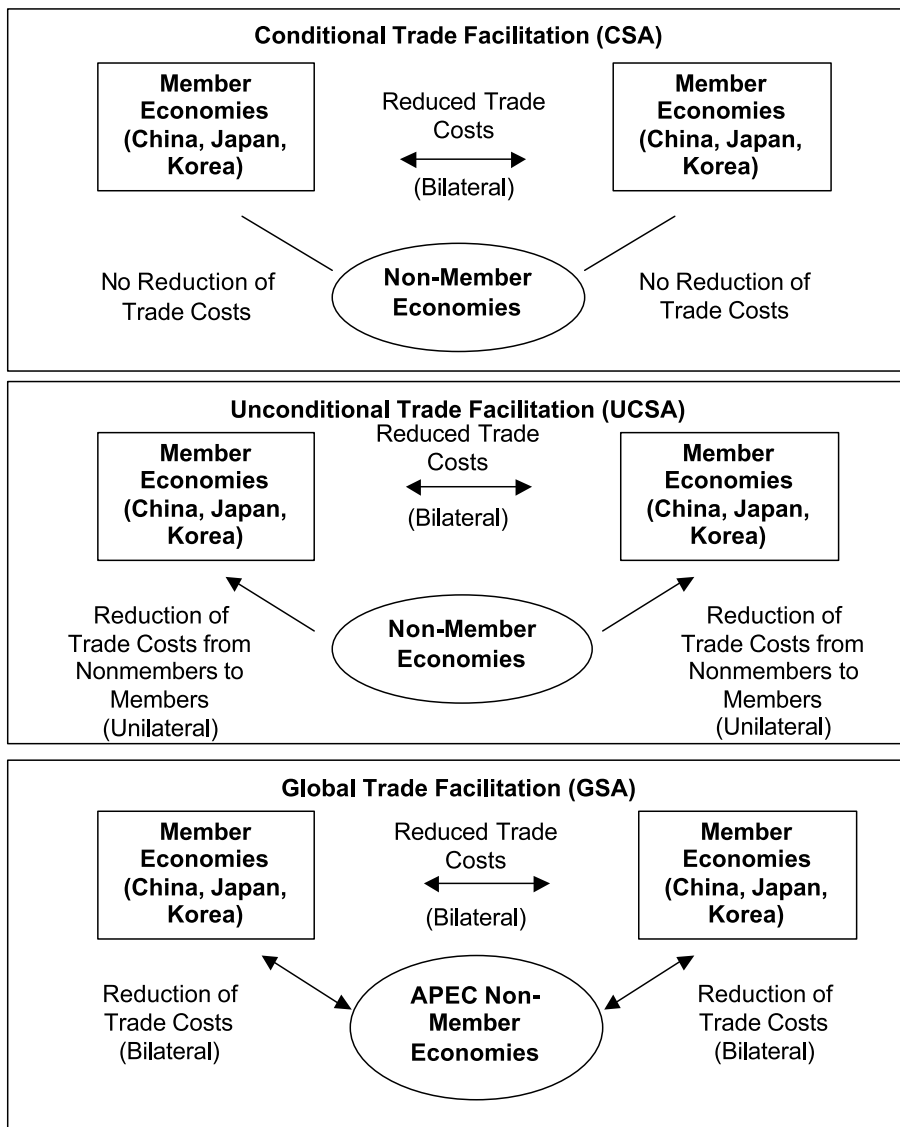**Figure 1. Trade Facilitation: Conditional, Unconditional and Global**

Simulation Results

Table 5 provides a comparative summary of the economic effects of trade liberalization through tariff reduction and trade facilitation in the Northeast Asian region. In order to evaluate the economic effects, we analyze the effect on real GDP, consumer price, and intra-regional trade structures. The intra-regional trade only

includes trade between the three Northeast Asian countries   China, Japan and Korea.

As shown in Table 5, both the establishment of a Northeast Asian three free trade area   NEFTA   and the conditional trade facilitation within the three countries   CSA   would result in increased real GDP for the three participating countries.   Korea and China would benefit the most, while Japan would experience relatively less gains. This is because China and Korea, as compared to Japan, have relatively higher intra-regional trade shares and higher dependency on intra-regional intermediate imports. In addition, China and Korea have higher tariff rates than Japan.[12]   The effect on consumer price indicates that income effect would surpass the price effect of trade liberalization in the region.   Intra-regional trade dependency would be remarkably increased, and it is estimated that this increase would bring even greater gains in the long run.   Therefore, the dynamic gains associated with the establishment of the Northeast Asian three free trade area and enhanced trade facilitation would largely surpass the static gains.

Since we cannot directly compare the effects of tariff reduction by 50 percent with the effects of improved trade facilitation by 5 percent, simulation results in Table 5 indicate that the trade liberalization through trade facilitation is an alternative way to achieve the goal of forming FTA by producing significant gains from freer and easier trade between the three countries in the region.   Thus, we strongly suggest that the FTA should stress trade facilitation rather than following common guidance on tariff reduction.

In order to evaluate likely impact of the expansion of trade liberalization through trade facilitation by the three countries, we use two additional simulations: UCSA   unconditional or unilateral trade facilitation by the three countries   and GSA   global or bilateral trade facilitation among the APEC member economies .   The results are also reported in Table 5.   We find that global effort for better trade facilitation is the best policy for the three countries in terms of GDP growth and stabilizing consumer price.   Obviously, the effect on intra-regional trade dependency is estimated to be less than that of the regional trade facilitation effort   CSA .   On the other hand, the unilateral trade facilitation may not be a good policy alternative for the three countries, as can be seen from the results in Table 5.

Table 5. Effects of Trade Liberalization

	Tariff Reduction	Trade Facilitation		
	NEFTA	**CSA**	**UNSA**	**GSA**
GDP*				
Korea	2.08	1.61	1.41	2.18
Japan	0.34	0.47	-0.39	0.47
China	1.56	1.48	0.91	2.00
Consumer Price*				
Korea	0.35	0.79	-0.49	-0.15
Japan	0.15	0.32	-0.86	-0.22
China	0.98	0.87	-0.21	0.26
Intra-Regional Import*				
Korea	29.03	25.86	3.70	-0.56
Japan	26.57	24.42	-4.23	-1.37
China	24.99	17.69	10.15	4.09
Intra-Regional Export*				
Korea	20.30	13.94	6.69	16.89
Japan	30.84	30.90	18.51	7.70
China	38.77	35.44	-1.89	-1.33
Intra-Regional Trade*				
Korea	25.17	20.59	5.02	7.15
Japan	28.86	27.90	7.99	3.50
China	30.76	25.12	5.11	1.83
Intra-Regional Import Share (%)**				
Korea (25.6)	8.1	7.1	2.3	1.3
Japan (14.5)	4.0	3.7	-0.02	0.6
China (31.2)	8.9	6.2	4.6	3.1
Intra-regional Export Share (%)**				
Korea (22.8)	4.9	6.2	-0.1	-1.4
Japan (14.9)	3.9	2.0	-0.1	-0.5
China (20.7)	2.4	4.2	0.8	-0.7
Intra-Regional Trade Share (%)**				
Korea (24.3)	6.6	6.8	1.0	-0.4
Japan (14.7)	4.0	2.7	-0.05	-0.05
China (25.7)	4.5	4.7	2.7	0.9

Notes: * - % deviation from the base value.
        ** - deviation from the base value figured in parentheses.
        NEFTA – A 50-percent reduction of import tariff rates by the three Northeast Asian member countries against imports from its members;
        CSA – A 5-percent reduction of trade facilitation costs only between the three Northeast Asian countries;
        UCSA – A 5-percent reduction of trade facilitation costs in each of the three Northeast Asian countries for its trade with all the other countries in the model;
        GSA – A 5-percent reduction of trade facilitation costs between each of the three Northeast Asian countries and all the other APEC economies in the model.

Table 6 summarizes the effects of trade liberalization on bilateral trade between the three countries. Tariff reduction increases bilateral trade between developing countries like China and developed countries like Japan and Korea but trade

facilitation works more effectively for bilateral trade between the two developed countries in the region. The degree of bilateral trade linkage is much weaker than those of the regional trade liberalization efforts NEFTA and CSA   as the trade facilitation opens toward other outside countries   UCSA and GSA .

Table 6: Effects of Trade Liberalization on Bilateral Trade*

Imports				Exports			
NEFTA							
to From	Korea	Japan	China	from to	Korea	Japan	China
Korea		11.9	18.5	Korea		21.9	53.3
Japan	17.6		27.7	Japan	12.2		35.2
China	55.0	31.7		China	27.0	36.4	
CSA							
to From	Korea	Japan	China	from to	Korea	Japan	China
Korea		12.7	5.1	Korea		33.4	33.0
Japan	26.5		23.0	Japan	18.1		36.0
China	24.6	28.5		China	10.6	29.3	
UCSA							
to From	Korea	Japan	China	from to	Korea	Japan	China
Korea		4.0	-1.2	Korea		14.3	-1.7
Japan	8.4		14.9	Japan	9.9		-1.9
China	-7.0	-7.1		China	4.1	21.1	
GSA							
to From	Korea	Japan	China	from to	Korea	Japan	China
Korea		12.1	9.9	Korea		8.7	-2.8
Japan	3.1		1.7	Japan	18.5		-1.0
China	-8.8	-6.1		China	15.6	7.1	

Notes: * - % deviation from the base value.
NEFTA – A 50-percent reduction of import tariff rates by the three Northeast Asian member countries against imports from its members;
CSA – A 5-percent reduction of trade facilitation costs only between the three Northeast Asian countries;
UCSA – A 5-percent reduction of trade facilitation costs in each of the three Northeast Asian countries for its trade with all the other countries in the model;
GSA – A 5-percent reduction of trade facilitation costs between each of the three Northeast Asian countries and all the other APEC economies in the model.

Concluding Remarks

Responding to proliferating RTAs in a globalizing world in the 21st century, economic cooperation between China, Japan and Korea through liberalizing their

external economic relations is being increasingly felt as the region seeks ways to recover from the economic sluggishness caused by the 1997 financial crisis. In order to revitalize the regional economy, we proposed a strategic policy measure - enhancing trade facilitation - that will enable the Northeast Asian FTA to create trade and further promote free trade and economic integration at the global level. However, in contrast to the empirical analyses for trade liberalization through tariff reduction, empirical research on the impact of trade liberalization through trade facilitation is very limited because of difficulties in the quantification of trade facilitation related data.

This study provided a quantitative analysis of the economic effects produced by improvements in trade facilitation between China, Japan and Korea as an alternative commercial policy to tariff reduction. We applied a general equilibrium analysis to estimate the general macroeconomic impact of the trade facilitation effort on each of the participating countries to compare the effects with those from tariff reduction.

From the CGE model analysis, we found that trade facilitation is a good trade liberalization policy alternative to free trade arrangement through tariff reduction. Both the establishment of a Northeast Asian three free trade area and the improved regional trade facilitation within the three countries would result in increased real GDP for the three participating countries. Korea and China would benefit the most, while Japan would experience relatively less gains. Intra-regional trade dependency would be remarkably increased and it is estimated that this increase would bring even greater gains in the long run. We also found that global effort for better trade facilitation opening to outside economies is the best policy for the three countries in terms of GDP growth and stabilizing consumer price. Furthermore, unlike tariff reduction, which boosts bilateral trade between developing countries and developed countries in the region, trade facilitation works more effectively for bilateral trade between the two developed countries in the region, that is, Korea and Japan. In sum, we strongly suggest that the possible Northeast Asian FTA should stress trade facilitation rather than following common guidance on tariff reduction.

Notes

Kim, Lee and Park 2004 and Kim and Park 2005 attempt to answer the same question but apply a gravity regression analysis which is not suitable to estimate macro-aggregate impacts compared to a CGE model analysis applied in this paper.

See Bhagwati, Greenaway, and Panagariya 1998 .

This section is an updated and abstracted revision of APEC 2002 .

See WTO 2001 .

See pp. 157-163 of Frankel 1997 for the relationship between the traditional "iceberg" method and transaction costs and tariffs. This section extends Frankel's idea and applies it to trade facilitation costs.

However, the complicated ex-ante simulation methodology sometimes mis-specifies the model economy together with lack of parametric choice as Panagariya and Gupta 2001 emphasize.

For detailed information about the GTAP5inGAMS, see http://debreu.colorado.edu/gtap5.

See Dimaranan and McDougall 2002 . Currently, GTAP 6 data base corresponding to the global economy in 2001 is available but the CGE model in GTAPinGAMS has not been adjusted to the updated data. That is why we are using GTAP 5 data base in this paper.

GAMS 20.7 Version developed in 2002. For details on the program, see Brook et al. 1998 .

10 For the assumption of a 50-percent tariff reduction rate, it is more practical that members gradually reduce the tariff rate within the agreed time schedule, even though a complete and immediate tariff reduction would be the ideal solution. For example, if Korea, China and Japan agree to reduce their tariff rate completely by 2010, this study estimates the case of a 50-percent tariff rate reduction to measure the short- and mid-term effects because it is difficult to estimate the long-term effects without adjusting the parameter values or exogenous variables in the model.

11 The APEC leaders instructed the ministers to realize a significant reduction in the transaction costs by endeavoring to reduce them by 5 percent across the region over the next five years at the Leaders' Meeting in Shanghai in 2001.

12 The tariff rate used in this study is the effective tariff rate in GTAP Data Version 5. The tariff rates of the three countries are 9.5 percent, 7.0 percent, and 14.0 percent in Korea, Japan, and China, respectively.

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