

# REGIONAL ECONOMIC INTEGRATION AND ITS IMPACTS ON GROWTH, POVERTY AND INCOME DISTRIBUTION: THE CASE OF VIETNAM

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Trade liberalization and regional economic integration have recently accelerated in East Asia, where several free trade areas have been established or are under negotiation. Vietnam, after acquiring Association of Southeast Asian Nations (ASEAN) membership in 1995, has signed a bilateral trade package with the United States and participated in the China-ASEAN free trade area. This paper attempts to analyze the impact on Vietnam of ongoing regional economic integration, focusing on growth, poverty reduction and income distribution. For this purpose, we have constructed a globally linked Computable General Equilibrium (CGE) model and made use of Global Trade Analysis Project (GTAP) database version 6.0 and Vietnam's living standards surveys. The simulation analysis shows that the regional economic integration generally has a positive impact. It both enhances welfare and improves income-distribution for Vietnam. Household income and consumption increase, and poor and rural household groups benefit more than urban high income groups.

## I. Introduction

Twenty years have passed since Vietnam began profound social and economic reforms that have transformed Vietnam from a centrally planned economy to a market economy. Since the early days of economic reforms, trade reforms and open-door policies have constituted an integral part of overall economic reforms. The restrictions and limitations on trade activities have been steadily and progressively removed, and Vietnam has successfully developed trade and investment relations with countries in Asia, Europe and North America. Trade reforms have contributed to the rapid growth of exports and overall economic growth.

The economic integration with the regional and global economy has recently accelerated in Vietnam. Vietnam became a member of ASEAN in 1995, and joined Asia-Pacific Economic Cooperation (APEC) in 1998, while negotiating for World Trade Organization (WTO) membership. Vietnam also concluded a bilateral trade agreement with the United States in 2000, and has participated in the China-ASEAN free trade area. Given the national target of sustained growth

and alleviation of poverty, Vietnamese policy makers are greatly concerned about the possible consequences of these liberalization movements on growth, poverty and income distribution.

This paper examines the impact of ongoing regional economic integration on Vietnam's economy, using a global Computable General Equilibrium (CGE) model. In Section 2, the discussion focuses on analysis of trade liberalization and regional economic integration in Vietnam. Section 3 examines poverty and income-distribution issues in Vietnam. The structure of the global CGE model is presented in Section 4, and simulation scenarios are performed and discussed in Section 5. Policy implications are drawn and some concluding remarks are given in Section 6.

## 2. Trade liberalization in vietnam

Since the late 1980s, Vietnam's trade reforms have progressed steadily, consisting of the creation and amendment of a system of taxation of imports and exports, the gradual removal of non-tariff barriers and progressive deregulation of trade regimes. The entry to trading activities has been liberalized both for state-owned enterprises and for private firms. For the majority of goods, businesses from all economic sectors are currently allowed to conduct export or import activities without having to acquire approval or license from the authorities. The deregulation of trading rights has increased the competitiveness and efficiency of trading activities.<sup>1</sup>

In regard to the import regime, the tariff system has been simplified and rationalized, and tariff rates have been lowered. The average weighted tariff rate dropped from nearly 20% in the early 1990s to around 15% in the late 1990s (SRV, 1999). Together with tariff reductions, non-tariff barriers have been abolished or relaxed. Quantitative restrictions on imports have been removed for the majority of commodities, with the exception of petroleum products, sugar, and some other strategic products. The surrender requirement and other currency control measures introduced in 1997 to cope with the East Asian crisis have been eliminated, and foreign-invested firms are no longer required to balance their foreign exchange accounts. The number of imports that are subject to the minimum valuation procedure has been reduced considerably.

With respect to exports, export duties and quotas have been removed for the majority of products. Only a small number of exports are being levied with export taxes, mainly for the purpose of raising revenue, and the tax rates are low. With the exception of some products regulated due to environmental, health or security concerns, quotas are only imposed on the export of garments and textiles to the EU, the United States and Canada. These quotas are imposed by the importing countries, and are determined in the bilateral trade agreements between Vietnam and these countries. The export quotas on garments and textiles are to be removed by WTO members in 2005, as mandated by the Agreement on Textiles and Clothing (ATC). However, Vietnam has to acquire WTO membership before it can open the US and EU market to garment and textile products.

High tariff rates and non-tariff barriers are generally employed to protect consumer goods, while capital goods and production inputs are subject to low tariffs and very few non-tariff barriers. As a result, the effective protection provided to many industries is higher than that offered by nominal protection. Several studies have shown that many industries, consumer

<sup>1</sup> Vietnam's trade regimes have been the subject of several studies, such as CIE (1998) and CIE (1999a). The non-tariff barriers that were present in Vietnam by 1999 are surveyed in detail in CIE (1999b) and McCarty (1999).

goods industries in particular, have enjoyed very high degrees of effective protection.<sup>2</sup> However, imports of some intermediate inputs being domestically produced, such as cement, fertilizers, or steel, have been subject to very high tariffs. Protection through tariff and non-tariff barriers is also provided to some so-called infant industries, such as automobile or petroleum products. Unlike consumer goods industries, the protection of upstream industries raises the price of intermediate inputs and negatively affects downstream industries and export activities.<sup>3</sup>

Together with unilateral reform measures, Vietnam has made important commitments to trade liberalization under various bilateral and multilateral agreements. Vietnam became a member of ASEAN in 1995, and joined APEC in 1998, while applying for the membership of the WTO. In 2000, Vietnam agreed to a landmark trade package with the United States. Together with other ASEAN members, Vietnam has participated in the recent formation of a free trade area between ASEAN and China. All these bilateral and multilateral agreements are being implemented, and are integral parts of Vietnam's trade reforms.

Under the ASEAN free trade area (AFTA), the member countries are obligated to reduce tariffs on intra-ASEAN trade to less than 5% by 2002. As a later member of ASEAN, Vietnam is allowed to fulfill its commitment to trade liberalization over a longer period. According to the Common Effective Preferential Tariff (CEPT) agreement, products with current tariff rates under 20% were to have tariffs reduced to 0–5% by the year 2003. For products with tariffs above 20%, rates are to be reduced to 0–5% by the year 2006. In addition to the tariff reductions, Vietnam is also obligated to remove quantitative restrictions and non-tariff barriers as soon as tariff reductions are carried out.<sup>4</sup> The implementation of CEPT began in 1996, but progressed slowly until 1999. Most products that were subject to early tariff cuts were not produced in Vietnam, or already had a tariff rate of less than 5% and were subject to very few non-tariff barriers. Since 2000, tariff reductions have been carried out for highly protected products and are expected to have a greater impact on the economy. When the tariff reduction under AFTA is completed by 2006, over 97% of Vietnam's tariff lines will have their tariffs reduced to less than 5%.

In November 2001, China and ASEAN agreed to establish a free trade area within ten years, where tariffs and non-tariff barriers will be removed by 2010 for China and six old ASEAN members, and by 2015 for four new ASEAN members, namely Vietnam, Laos, Cambodia and Myanmar. The liberalization measures are planned to take place in 2005, and will be conducted on a reciprocal basis. The formation of this free trade area is expected to serve the interests of both sides, with ASEAN members looking for new export opportunities in China's huge market and China seeking for natural-resource based inputs from ASEAN. The China-ASEAN free trade area is, however, one of many efforts made by East Asian countries to liberalize trade and investment regimes in the region. ASEAN is seeking other free trade areas with Japan, Korea, Australia, and New Zealand. Meanwhile, Japan has concluded free trade agreements with Singapore and Mexico, and is negotiating with Korea, and some ASEAN members. It can be said that all these efforts have been to promote a broader free trade area in the East Asian region.

<sup>2</sup> See, for example, CIE (1998) and Fukase and Martin (1998) for estimates of effective protection rates by industries.

<sup>3</sup> Fukase and Martin (1998) show that export-oriented industries suffer negative effective protection, as protection given to intermediate inputs raises the cost of production.

<sup>4</sup> See, for example, Forster (1998) and Thang (1999) for the detailed liberalization schedule under AFTA.

The APEC grouping was established in 1989 with the objective of liberalizing and facilitating trade and investment. The goals of APEC, as defined in the APEC Leaders Meeting in Bogor, Indonesia in November 1994, are to achieve free trade and investment for the region by 2010 for developed countries, and 2020 for developing member countries. As an APEC member, Vietnam has made commitments to unilateral trade liberalization, including free trade, the liberalization of investment regimes and the opening of service sectors to foreign providers (SRV, 1999).

It is worthwhile to make some notes about the geographical composition of Vietnam's trade, which has greatly changed over the last two decades and reflects the dramatic changes in the international situation and the implementation of the country's open-door policies. Until the late 1980s, Vietnam traded mainly with the Soviet Union and the Eastern European countries. The collapse of the former Soviet Union interrupted trade relations with these countries, and Vietnam redirected trade toward Asian countries. These dominated Vietnam's trade in early 1990s. Since the mid 1990s, particularly after the Asian crisis led to a sharp contraction of export markets in the region, the country has managed to expand trade toward Europe, North America and the rest of the world.

Vietnam's trade with its ASEAN neighbors has been relatively small and, surprisingly, its share in total trade has been on the decline despite the implementation of AFTA. In 2003, only 23.6% of imports were sourced from ASEAN, and 14.7% of total exports were shipped to ASEAN. Among ASEAN countries, Singapore is the largest trading partner, accounting for more than 50% of imports from ASEAN and around 30% of exports to ASEAN countries. As can be seen in Table 1, the decline in trade with ASEAN countries is largely caused by the fall

**Table 1. Trade direction of Vietnam 1995–2003**

	1995	2000	2001	2002	2003
<b>A. Exports</b>					
Total value (million dollars)	5448.9	14 483.0	15 029.0	16 706.1	20 176.0
Composition of exports (% of total)					
ASEAN	18.3	18.1	17.0	14.6	14.7
Singapore	12.7	6.1	6.9	5.8	5.1
Other ASEAN countries	5.6	12.0	10.0	8.8	9.6
NIEs	17.1	9.8	10.2	9.7	8.0
Japan	26.8	17.8	16.7	14.6	14.4
China	6.6	10.6	9.4	9.1	8.7
EU	12.2	19.6	20.0	18.9	19.1
<b>B. Imports</b>					
Total value (million dollars)	8155.4	15 636.5	16 218.0	19 745.6	25 226.9
Composition of imports (% of total)					
ASEAN	27.8	28.5	25.7	24.2	23.6
Of which Singapore	17.5	17.2	15.3	12.8	11.4
Other ASEAN countries	10.4	11.2	10.4	11.3	12.2
NIEs	31.6	27.1	27.3	28.4	25.9
Japan	11.2	14.7	13.5	12.7	11.9
China	4.0	9.0	9.9	10.9	12.4
EU	8.7	8.4	9.3	9.3	9.8
US	1.6	2.3	2.5	2.3	4.5
Others	15.0	10.1	11.8	12.2	11.9

Source: Vietnam's Statistical Yearbook 2003 (GSO, 2004).

in the bilateral trade between Vietnam and Singapore.<sup>5</sup> As for other ASEAN members, imports from these countries nearly doubled between 2000 and 2003 following the reduction in tariffs imposed on ASEAN exports. However, Vietnam seems not to have exploited the advantage of the tariff reductions in ASEAN trading partners, and exports of Vietnam to these markets increased only modestly during the same period.

North East Asian countries have been the major trading partners of Vietnam. They account for nearly one third of Vietnam's exports and half of its imports. While trade with Japan and the East Asian new industrialized economies (NIEs) has been declining in importance, two-way trade with China has been on a steady and rapid increase since the mid-1990s. Both exports to and imports from China increased more than ten times during the last 10 years, and China has recently passed Japan to become Vietnam's largest import market. Given the fact that the two economies are growing fast, bilateral trade between Vietnam and China is expected to continue to rapidly rise in the foreseeable future. With the exception of Japan, Vietnam has usually suffered from large trade deficits with ASEAN and other East Asian countries. In the case of East Asian NIEs, large imports from these countries are mainly caused by the inflows of foreign direct investment. For China and some ASEAN countries, the large trade deficits reflect the lack of competitiveness of Vietnam's exports in these markets.<sup>6</sup>

Another striking fact about Vietnam's trade direction is that the European Union and the United States of America have become increasingly important for Vietnam's exports. Trade with European countries increased rapidly during the latter half of the 1990s, when Vietnam managed to expand the market for its exports in response to the slowdown in trade with East Asia caused by the East Asian economic crisis. Until the signing of the bilateral trade agreement between Vietnam and the US in 2000, trade between two countries had been relatively small. The granting of the US most favored nation status to Vietnam has opened the US market for Vietnam's exports, and the US now has become Vietnam's largest export market. Combined together, exports to the US and the EU amounted to nearly \$8 billion US in 2003, equaling 40% of Vietnam's total exports. These are also the major markets for exports of labor-intensive products such as agricultural products, wearing apparel, textiles, and footwear. However, Vietnam's exports of textiles and wearing apparel to the US and the EU are expected to face more competition from China after the phase-out of the Multi-Fibre Agreement (MFA), implemented in 2005.

### 3. Poverty and income distribution

When Vietnam started economic reforms 20 years ago, it was a very poor country with a per capita income of less than \$200 US. Most Vietnamese people then lived below the poverty line with an estimated poverty incidence of over 70%. The rapid economic growth over the last decade has not only increased the national income, but also sharply reduced the incidence of

<sup>5</sup> It should be noted that Singapore, like Hong Kong, has been acting as a sub-contractor for Vietnam's exports and imports. A significant proportion of trade with these two countries may have been re-exported to, or re-imported from, other countries. The fall in trade with Singapore, therefore, may largely reflect the fact that Vietnam has become increasingly familiar with the international market and it can export or import goods without going through trading companies in Singapore or Hong Kong.

<sup>6</sup> As an example, the textile and clothing industries are the major export industries in Vietnam, but they export mainly low-quality products to low end markets. These industries cannot even compete with China's exports in the domestic markets without tariff protection.

poverty. The percentage of poor people fell sharply to 50% in 1993, 37% in 1998 and 15% in 2002 (GSO 2000, 2003). The absolute poverty incidence based on the food poverty line also fell from 25% to less than 10% between 1993 and 2002.

Despite the impressive achievement in its alleviation, the incidence of poverty is unevenly distributed among regions. About 90% of the poor live in rural areas, whereas the remaining 10% are urban dwellers (World Bank 1999). This implies that the poverty in rural areas is more serious than the average national level. The incidence of poverty is also found high in mountainous and remote regions, particularly in the Northern Uplands and Central Highlands. These are also the poorest regions of Vietnam, and have relatively slow economic growth. This fact indicates that focusing on rural development and allocating more resources to poor regions are essential for the further reduction of poverty in Vietnam.

There are several explanations for the rapid reduction in poverty. First, agriculture expanded quite quickly and contributed to an increase in income in rural areas where the majority of the poor live. The growth of agriculture and agricultural exports also helped Vietnam to stabilize the economy during the late 1980s. Second, the agricultural terms of trade changed in favour of agriculture and rural areas. Over the last decade food prices increased faster than non-food prices, largely due to the liberalization of the agricultural product market and the increase in export prices. As a result, rural income rose quite quickly and this benefited the rural poor. Finally, as pointed out by the World Bank (1999), a large proportion of the population initially lived just below the poverty line. Even a small increase in income could lift them above the line. This also means, however, that those people were vulnerable to the change in the economic environment, and that they could easily fall back below the poverty line.

Vietnam has remained a relatively equitable country by international standards; this is attributable to the relatively equal income distribution in rural areas. However, inequality has increased slightly during the years of rapid economic growth. The Gini coefficient increased from 0.33 to 0.35 between 1993 and 1998, and the income ratio between the poorest and the richest quintiles also rose from 4.9 to 5.5 during this period (Kinh *et al.*, 2001). The increased inequality is largely due to the widening income gap between rural and urban areas that, as indicated by the World Bank (1999), accounted for 96% of the total rise in inequality. The urban economy, based largely on manufactures and services, grew as twice as much the rural economy, and the ratio of urban to rural income rose from 1.8 in 1993 to 2.2 in 1998.

Table 2 provides a profile of income distribution with respect to income, expenditure, and employment. The table is processed using the latest household survey conducted by Vietnam's General Statistical Office in 2002 (VLSS 2002). The survey data, covering 30 000 households, is aggregated into 20 household groups. These households consist of 10 urban groups and 10 rural groups, which are classified based on the level of expenditure. As can be seen in Table 2, there are large income gaps among household groups. The per capita income of the richest urban group is almost 8 times higher than that of the poorest urban group, while the figure for rural areas is 6.4, suggesting that inequality is higher in urban areas than in rural areas. The share of the poorest decile group in total income is only 3.4%, while the richest decile accounts for nearly 27% of total income. Poor households tend to rely more on agriculture and informal services, partly reflecting their lack of physical capital and a low level of educational attainment. The urban lowest income group spends nearly 70% of their working time on agriculture, whereas the figure for the rural lowest income group is 88%. Low-income groups also are involved more in

Table 2. Income distribution in Vietnam

	Unit	Total	Urban			Rural		
			Total	Lowest decile group	Highest decile group	Total	Lowest decile group	Highest decile group
Average household income	1000 VND	20972	33 444.3	9009.418	53 328.7	17 050.06	8336.474	36 319.45
Share of household income	%	100.0	38.1	0.2	20.9	61.9	3.2	5.9
Composition of income by sources	%	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Self-employed agriculture	%	31.4	6.9	44.4	2.7	46.5	66.6	25.5
Self-employed non-agricultural	%	21.7	30.6	25.5	30.3	16.2	5.2	26.4
Wage income	%	30.5	42.3	20.0	42.8	23.2	19.8	21.0
Transfers	%	16.4	20.2	10.1	24.2	14.1	8.4	27.2
Annual income per capita	1000 VND	4510.3	7468.9	1650.6	12 905.7	3624.6	1520.1	9790.8
Income ratio	Unit	1.0	1.7	0.4	2.9	0.8	0.3	2.2
Annual expenditure per capita	1000 VND	3414.1	5829.6	1120.2	10 579.9	2691.1	1100.3	9265.3
Expenditure ratio	Unit	1.0	1.7	0.3	3.1	0.8	0.3	2.7
Annual working hours (per workers)	Hours	1583.2	2034.7	1340.9	2276.8	1474.6	1404.6	1746.8
Average wage rate (per hours)	VND	3840.9	5537.0	1156.6	7809.9	2854.5	1613.2	5182.4
Wage ratio	Unit	1.0	1.4	0.3	2.0	0.7	0.4	1.3
Composition of employment by economic sectors	%	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Formal	%	14.8	29.5	6.1	38.8	10.0	2.7	24.8
Informal	%	85.2	70.5	93.9	61.2	90.0	97.3	75.2
Composition of employment by industry	%	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Agriculture	%	51.3	13.7	69.7	3.6	63.9	87.7	30.2
Industry and construction	%	19.5	27.3	10.3	27.4	16.8	7.1	21.7
Services	%	29.2	59.0	19.9	68.9	19.3	5.1	48.1

Source: Authors' calculation based on Vietnam's Living Standard Survey 2002 (GSO 2003).



trade and other low-productivity services in the informal sector, and by contrast, higher income groups tend to work more in industries and formal services.<sup>7</sup>

From the survey data, we also find that poor households are involved more in small-scale, labor-intensive manufactures, while the rich usually have jobs in capital-intensive and highly protected manufactures. Due to the differences in skills and the characteristics of jobs, the average wage rates of poor groups are considerably lower than those of high income groups. For example, the average wage rate of the rural lowest income group is around 40% of the national average wage, and the figure for the urban lowest income group is only 30%. The difference in the composition of jobs also results in the different composition of income between the rich and the poor. Income in poor households largely originates from agriculture, labor-intensive industries and informal services, while the rich have income sources mainly from capital-intensive industries and formal services. This income pattern is what can be expected from a developing country like Vietnam, and it also has important implications for development policies; that is, promoting agriculture and labor-intensive industries is essential for reducing poverty and improving income distribution in Vietnam.

According to the official statistics, the unemployment rate is around 7% of the labor force, which is a moderate figure when compared with both developed and developing countries. However, despite the low unemployment rate, underemployment is a serious problem in Vietnam. Based on the assumption of full-time annual work of 2000 hours, around 50% of urban workers and 70% of rural workers can be seen as underemployed.<sup>8</sup> On average, a Vietnamese worker works slightly less than 1600 hours a year, suggesting an underemployment rate of more than 20%. The incidence of underemployment varies across regions and household groups. Reflecting the limited availability of arable land and off-farm jobs, underemployment is particularly high in rural areas where an average worker uses only three-fourths of his working time. In urban areas, underemployment is generally less serious, with the average year-round number of working hours amounting to over 2000. However, urban low-income groups have fewer working hours than high-income groups. A similar trend is also observed in rural areas, where underemployment mainly affects low-income groups.

#### 4. Model specification

This section will discuss the major characteristics of the global CGE model used in this paper. Our model generally follows the standard neoclassical CGE model (Dervis *et al.*, 1982), but extends the standard model by allowing for several countries and regions, and international link mechanisms.<sup>9</sup> Our model specifies ten industries and eleven countries or regions. The ten industries consist of crops, other agricultural activities, mining, food processing, light manufactures, heavy manufactures, machinery and equipment, public utilities, construction and services. The countries and regions in the model are specified with the focus on the East Asian region. Eleven countries and regions are China, Indonesia, Malaysia, Thailand, Philippines,

<sup>7</sup> The formal sector consists of the state sectors and foreign-invested sector, while the rest of the economy can be considered as informal.

<sup>8</sup> This is calculated based on the assumption of full-time work of 40 hours per week and 50 working weeks a year.

<sup>9</sup> Our model of Vietnam and global link system originate from, Nguyen (2002), Ezaki and Nguyen (2001), Ezaki (2001).



Vietnam, East Asian newly industrializing economies (NIEs), Japan, the North American free trade area (NAFTA), the European Union (EU) and the rest of the world.

#### 4.1 Each economy's model

In each economy's model, domestic output in each sector is a Constant Elasticity of Substitution (CES) function of capital and labor. Domestic producers who seek to maximize profits decide how much they sell in domestic and foreign markets, depending on the domestic and export prices. Domestic output is supplied to domestic or foreign markets according to the Constant Elasticity of Transformation (CET) function, where domestic products and exports are treated as imperfect substitutes. The supply of domestic products and exports is derived from the revenue maximization condition.

The factor demand is derived from the profit maximization condition, and factor remuneration is equal to the value-added price times the partial derivative of the production function with respect to each factor. Since our model focuses on the long-term impact of regional integration, the factor market is modeled on the assumption of full employment. Capital is intersectorally immobile, and the capital stock in each sector is fixed, letting the first-order condition determine capital rents. The treatment of the labor market allows for labor mobility, but takes into consideration distortions in the labor market. The model generally specifies two kinds of labor, skilled and unskilled. Sectoral labor demand is a CES function of skilled and unskilled labor, and the demand for each type of labor is derived from the first-order condition. Sectoral wages are equal to the average wage level times the exogenous coefficients, which represent wage differentials between economic sectors and types of labor. With the adoption of exogenous wage differentials, we implicitly assume that the different wage rates reflect the productivity differentials pertaining to each industry and labor type.

In regard to the model for Vietnam, each type of labor is further divided into formal and informal labor, to capture the characteristics of the segmented labor market. Labor can move between these two sectors, but the wage rates of formal and informal labor are subject to different adjustment mechanisms. For workers in the formal sector, that is those workers in the state sector and foreign invested firms, the real wage rates are fixed by institutional factors. Since the informal sector, which includes agricultural and non-agricultural small businesses, is largely unregulated in Vietnam, the informal wage rate is treated as flexible. The supply of labor to the informal sector is determined as the difference between total supply of labor and the demand for formal labor.

Household income consists of labor and capital income, which is allocated to each household by using fixed coefficients. To allow for a detailed inspection of the impact of trade liberalization on income distribution in Vietnam, the household sector in Vietnam's model is disaggregated into 20 household groups, consisting of 10 urban groups and 10 rural groups. Government revenue consists of indirect taxes, import tariffs, and export duties. Savings by each institution are the difference between income and expenditure. On the demand side, household consumption demand is based on a Cobb-Douglas utility function, with fixed expenditure shares. The government demand for final goods is defined using fixed expenditure shares of government real spending. The demand for inventory investment is determined by using the fixed proportions of sectoral output, and the sectoral demand for capital goods is computed through exogenous share coefficients.

Total domestic demand is satisfied through domestic production and imports. The demand for imports is modeled on the Armington structure, in which domestic and foreign goods are imperfect substitutes. The sectoral composite good, or total domestic demand, is a CES function of imported and domestically produced goods, and the demand for imports is derived from the cost minimization condition. In this treatment, the demand for imports and domestic products varies with the changes in the relative prices of domestic products and imports.

## 4.2 International linkages

Each economy's models are linked through bilateral trade flows. Since our model allows for different tariffs on imports depending on the countries of origin, the domestic prices of imports varies with the import sources. Specifically, the import price on the domestic market is equal to the export price of the country of origin times the corresponding tariff rates. Domestic consumers and producers differentiate imports by sources; that is, imports coming from different countries are considered as imperfect substitutes. This characteristic also follows the Armington structure. At the aggregate level, total imports are a CES function of imports from different sources. The demand for imports from each source is then derived from the cost minimization condition.

On the export side, exporters do not differentiate exports by countries of destination; commodities supplied to foreign countries are seen as completely homogenous and are sold at the same price. The trade consistency is held so that total exports supplied by home countries must equal the sum of imports by foreign countries. More specifically, imports from a country or region must add up to total exports by that country or region. The model does not allow for any movement of labor and capital between countries or regions; that is, labor and capital are internationally immobile. Thus, trade flows provide the only channel through which any change in the economic policy or economic environment in one country transmits its effect to other countries.

## 4.3 Equilibrium conditions

Equilibrium conditions consist of the conditions in factor, commodity, and foreign exchange markets. In the capital market, capital stocks are fixed and capital rents serve as equilibrating variables. In the labor market, total supply of skilled and unskilled labor is held fixed at the base-run level, and the labor market equilibrium determines wage rates. In the model for Vietnam, there are two different equilibrating mechanisms for formal and informal labor markets. In the formal sector, wage rates are held fixed by institutional factors and the equilibrium condition determines the demand for formal labor. In the informal labor market, wage rates adjust flexibly to attain the equilibrium between supply and demand.

Equilibrium in product markets equates the supply of the domestic goods in each sector to the sum of product demand, with domestic prices serving as equilibrating variables. The fiscal balance is implied in the treatment of the government sector, in which government consumption and savings are determined as fixed shares of government revenue. For the savings-investment identity, we adopted a so-called savings-driven closure, in which total nominal investment is determined by available savings. In the foreign exchange market, foreign savings held fixed and equilibrium was achieved through price adjustments. We also fixed the exchange rates of all

countries and regions at the base run level. In this setting, the domestic price level changes and causes the exchange rate to adjust in real terms to attain equilibrium between the market supply of and the demand for foreign exchange.

## 5. Simulation analysis

### 5.1 Data and the model calibration

To run the model, we made use of GTAP database version 6.0, constructed in 2001. The GTAP database is a highly disaggregated global input-output table, differentiating 57 industries and 87 countries or regions. These data are then aggregated into 10 industries and 11 countries or regions in accordance with the model. We took 2001 as the benchmark year and used GTAP data to calculate most of the parameters in the model, such as consumption shares, saving rates, tax rates and wage rates. In regard to labor and capital, GTAP database provides only information on total labor and capital stock for each country or region. Total labor and capital stock is then allocated to each industry by assuming uniform wage rates and uniform capital rents.

To calculate the share and scale parameters in trade and production functions, we followed the calibration procedure commonly employed in CGE modelling. The elasticities of substitution in trade and production functions are taken from the GTAP database, consisting of the elasticity of substitution between labor and capital, the elasticity of substitution between domestically produced goods and imports and the elasticity of substitution between imports from different sources. Generally, the GTAP database gives high values to the elasticities in trade functions, while assigning relatively low values to the elasticity of substitution in production functions. We assigned a value of 1.2 to the elasticity of transformation in the export supply function for all industries. Given the type of functions and the value of the elasticities, the scale and share parameters can be calculated directly from the benchmark data.

In regard to the model for Vietnam, the household sector is constructed using Vietnam's living standard survey (VLSS) conducted by Vietnam's General Statistical Office in 2002. From the VLSS 2002, we processed data on household income, which is disaggregated for around 70 industries and each type of primary factors. Income shares were then computed and were used to allocate the data on factor income taken from GTAP database to each household groups and industries. Based on VLSS 2002, household expenditure disaggregated for 67 commodities were calculated for each household group. From this information, the expenditure shares were computed, and were used to allocate GTAP data on private consumption to household groups. Data on household employment was also derived from the VLSS 2002, and was based on the number of working hours instead of the number of workers.<sup>10</sup> This data was computed for each type of worker: formal and skilled workers, informal and skilled workers, formal and unskilled workers and informal and unskilled workers. It was used to allocate employment data derived from GTAP database to each household group.

Quantitative restrictions and other non-tariff barriers have actually been important instruments of protection in many countries, but unfortunately they are not quantified in this version of the GTAP database. The database provides only data on tariffs and the export-tax equivalent rates of the Multi-fibre Agreement (MFA). To a certain extent, this data also shows the degree

<sup>10</sup> Because each worker can have more than one job and underemployment is widespread, using the number of working hours could reflect better the household's employment composition.

**Table 3. Simulation scenarios**

S0	Base run
S1	Removing tariffs on the bilateral trade between Vietnam and ASEAN-4
S2	Removing tariffs on the bilateral trade between Vietnam, China and ASEAN-4
S3	Removing tariffs on the bilateral trade between Vietnam, China, ASEAN-4, East Asian NIEs and Japan (East Asian Economic Community)
S4	Removing tariffs on the bilateral trade between Vietnam, China, ASEAN-4, East Asian NIEs, Japan and North America
S5	Multilateral Trade liberalization

and structure of protection of the countries and regions in investigation. High average tariff rates are observed in the case of Vietnam, China and Thailand, suggesting a high degree of protection of domestic industries in these countries. The average rates for the remaining countries and regions are relatively low. For China and ASEAN countries, highly protected products are crop products, processed food and light manufactures, in which high tariffs are observed. The high degree of protection is also provided to crop products and the food processing industry in Japan and East Asian NIEs. For other industrial countries and regions like the EU and NAFTA, tariffs imposed on agricultural products and light manufactures are moderate, since these sectors are mainly protected through non-tariff instruments, such as domestic subsidies or export restrictions.

## 5.2 Simulation results

The model described in Section 4 was employed to analyze the effect on Vietnam of different economic integration scenarios. Five simulations were performed and are described briefly in Table 3. Simulation results are reported in Tables 4 to 7.<sup>11</sup> These five simulation scenarios have been formulated to cover the different economic integration options for Vietnam, including the ASEAN free trade area, the China-ASEAN free trade area, the possible formation of an East Asian economic community, APEC trade liberalization and the world-wide multilateral trade liberalization. In all these simulations, we focus on the impact of tariff reductions and simply assume a complete removal of tariffs.

Simulation S1 is designed to evaluate the impact of the ASEAN free trade area on Vietnam. We removed all tariffs on the bilateral trade between Vietnam and four ASEAN members, Indonesia, Thailand, Malaysia and Philippines.<sup>12</sup> The tariff removal stimulates the bilateral trade between ASEAN countries, and both exports and imports increase in all countries. The extent to which exports or imports increases, however, depends on the structure of protection and the composition of trade in each countries. Since foreign savings are fixed in the model, the exchange rate adjusts to attain the current account balance. The exchange rate depreciates if imports increase more than exports and it appreciates otherwise. At the aggregate level, the real exchange rate depreciates in all ASEAN countries with the exception of Indonesia. GDP falls slightly in Vietnam and Thailand in real terms, but increases in Malaysia and the Philippines.

<sup>11</sup> There is a concern that, in a global CGE model, computational errors can occur for small countries like Vietnam. However, our model has consistently replicated the benchmark data set in the base run, for Vietnam as well as other countries and regions.

<sup>12</sup> Hereafter, we will refer to these countries as ASEAN-4.

Table 4. Effect of economic integration on countries and regions

	China	Indonesia	Malaysia	Philippines	Thailand	Vietnam	NIEs	Japan	NAFTA	EU	ROW
Simulation Scenario S1											
Real GDP	0.02	0.01	0.04	0.00	-0.01	-0.06	0.00	0.00	0.00	0.00	0.00
Private consumption	-0.05	0.37	4.03	0.95	1.64	2.21	-0.07	-0.02	0.02	0.00	-0.02
Imports	-1.66	-0.73	-0.89	1.65	1.02	3.15	-0.27	-0.60	0.86	-0.02	-0.11
Exports	0.74	1.25	1.26	0.52	1.82	1.73	0.04	0.23	-0.37	0.01	0.03
Simulation Scenario S2											
Real GDP	0.00	-0.01	0.06	0.02	-0.02	-0.18	0.00	0.00	0.00	0.00	0.00
Private consumption	0.47	0.95	5.95	1.18	3.46	4.66	-0.22	-0.04	-0.01	-0.01	-0.02
Imports	1.63	3.61	4.21	1.90	5.04	4.62	-0.46	-0.49	-0.07	-0.05	-0.07
Exports	1.14	0.73	1.09	1.11	2.10	5.31	-0.12	-0.14	-0.02	-0.01	-0.03
Simulation Scenario S3											
Real GDP	-0.20	0.00	0.11	0.05	-0.11	-0.68	0.06	0.00	0.00	0.00	0.00
Private consumption	2.27	1.14	6.71	0.89	6.34	9.05	1.93	0.36	-0.04	-0.06	-0.06
Imports	8.63	3.15	4.15	1.18	8.64	10.87	2.95	3.54	-0.43	-0.19	-0.28
Exports	4.98	1.18	2.11	1.52	3.97	12.31	2.36	1.97	-0.11	-0.02	-0.12
Simulation Scenario S4											
Real GDP	-0.21	-0.02	0.13	0.08	-0.12	-0.56	0.00	0.00	-0.01	0.01	-0.01
Private consumption	3.41	1.41	7.74	1.16	6.56	9.43	2.80	0.70	0.20	-0.14	-0.13
Imports	11.69	4.68	5.02	1.61	8.81	11.78	4.28	5.29	1.48	-0.34	-0.51
Exports	6.66	1.09	2.27	1.95	4.36	13.91	3.05	3.43	1.94	-0.03	-0.33
Simulation Scenario S5											
Real GDP	-0.51	-0.10	0.08	0.09	-0.34	-0.55	-0.01	-0.02	-0.01	0.04	-0.01
Private consumption	5.22	2.56	9.21	0.81	8.61	11.23	3.28	0.83	0.30	0.07	2.47
Imports	18.49	9.27	7.45	1.00	11.77	15.39	5.36	6.57	2.12	0.51	6.37
Exports	8.87	1.13	2.56	2.30	5.61	18.24	4.18	4.45	3.46	0.95	4.84

Source: Authors' calculation.

**Table 5. Effect of trade liberalization on Vietnam**

	Unit	Base run	Percentage change (%)				
		S0	S1	S2	S3	S4	S5
Consumer price index	Unit	1.00	−5.83	−1.02	−3.70	−3.22	−1.80
Exchange rate	Unit	1.00	0.00	0.00	0.00	0.00	0.00
Average wage rates	Thousand USD	0.28	−3.61	3.33	4.80	5.91	9.54
Skilled labor	Thousand USD	0.55	−4.03	2.55	3.83	5.06	8.23
Unskilled labor	Thousand USD	0.21	−3.27	4.11	5.71	6.67	10.67
Capital rent	Unit	0.18	−3.91	3.38	3.97	4.65	7.59
Real GDP	Million USD	30 340.73	−0.06	−0.18	−0.68	−0.56	−0.55
Output	Million USD	66 170.38	0.45	0.84	1.63	2.07	2.96
Private consumption	Million USD	27 213.19	2.21	4.66	9.05	9.43	11.23
Government consumption	Million USD	2607.05	−12.89	−26.42	−43.36	−43.03	−43.17
Real investment	Million USD	12 938.58	2.48	−1.25	−3.13	−3.63	−4.76
Imports	Million USD	27 434.05	3.15	4.62	10.87	11.78	15.39
Exports	Million USD	15 015.96	1.73	5.31	12.31	13.91	18.24
Household income	Million USD	28 121.22	−3.78	3.42	4.37	5.21	8.45
Labor income (skilled labor)	Million USD	4740.35	−4.03	2.55	3.83	5.06	8.23
Labor income (unskilled labor)	Million USD	6852.58	−3.27	4.11	5.71	6.67	10.67
Capital income	Million USD	16 528.29	−3.91	3.38	3.97	4.65	7.59
Government revenue	Million USD	5180.36	−17.24	−25.92	−43.02	−42.32	−41.61

Source: Authors' calculation.

The increase in imports put downward pressure on domestic demand and force domestic prices to fall. Combined with the increase in income, this leads to an increase in consumption. The gain in consumption can be seen in all countries, with the greatest gain observed in Malaysia.

In regard to Vietnam, real household income and consumption rise by around 2.0% on average. The welfare gain for Vietnam comes from both the tariff removal in Vietnam and the removal of tariffs imposed on Vietnam's exports in ASEAN trading partners. While the tariff removal in Vietnam reduces the cost of imported goods and improves resource allocation, the removal of tariffs in other ASEAN countries expands the market for Vietnam's exports. The ASEAN free trade area benefits mostly agriculture and labor-intensive industries, and generally has positive effects on the reduction of poverty and on income distribution in Vietnam. Income to unskilled labor, which constitutes a large share of income in poor households, increases more than income to skilled labor and capital. All household groups have income gains, with the poor groups having slightly higher gains than the rich. However, the AFTA tariff removal also causes trade diversions, although not to a large extent. Both exports to and imports from ASEAN countries rise sharply, while trade with non-ASEAN countries or regions falls.

The impact of the recently established China-ASEAN free trade area is considered in simulation S2, where tariffs on the bilateral trade between China, Vietnam and ASEAN-4 are completely eliminated. As in S1, exports and imports rise in all countries, and all countries experience gains in consumption. The biggest gains are seen in Malaysia. The real exchange rate depreciation occurs in all countries except Indonesia and Malaysia. The inclusion of China seems have a negative impact on Japan and East Asian NIEs, with the volume of trade declining slightly in these countries.

For Vietnam, the gain in consumption amounts to more than 4%. This is the combined result of a greater tariff reduction in Vietnam and the removal of Chinese tariffs imposed on

**Table 6. Effect on income distribution of Vietnam**

	Household income					Household consumption				
	S1	S2	S3	S4	S5	S1	S2	S3	S4	S5
Percentage changes compared with the base-run (%)										
Urban group 1	2.43	4.86	9.13	9.38	11.77	2.58	4.42	10.35	10.74	13.06
Urban group 2	2.52	5.19	9.73	10.21	13.02	2.70	4.79	11.00	11.59	14.33
Urban group 3	2.44	4.47	7.57	7.53	8.88	2.58	4.08	8.53	8.58	9.85
Urban group 4	2.24	4.22	8.09	8.45	10.49	2.31	3.72	8.68	9.11	11.05
Urban group 5	2.41	4.60	8.51	9.07	11.43	2.57	4.27	9.49	10.14	12.42
Urban group 6	2.36	4.47	7.90	8.35	10.17	2.40	4.04	8.27	8.75	10.49
Urban group 7	2.10	4.04	7.69	8.17	9.89	2.13	3.72	8.06	8.57	10.23
Urban group 8	2.10	4.39	8.40	9.05	11.17	2.06	4.00	8.34	9.00	11.02
Urban group 9	1.87	3.73	7.51	8.15	9.94	1.84	3.53	7.58	8.21	9.96
Urban group 10	1.64	3.55	7.12	7.68	9.16	1.72	3.85	7.70	8.23	9.73
Rural group 1	2.80	5.99	9.34	8.97	10.73	3.06	5.71	11.14	10.92	12.62
Rural group 2	2.77	5.78	9.30	9.14	11.09	3.02	5.49	10.89	10.83	12.72
Rural group 3	2.61	5.55	9.17	9.15	11.17	2.84	5.26	10.64	10.72	12.67
Rural group 4	2.61	5.60	9.49	9.68	12.15	2.79	5.29	10.68	10.95	13.34
Rural group 5	2.49	5.38	8.91	9.02	11.00	2.65	5.12	9.96	10.12	12.03
Rural group 6	2.37	5.37	9.14	9.34	11.44	2.54	5.24	10.20	10.44	12.48
Rural group 7	2.17	4.82	8.37	8.61	10.52	2.35	4.91	9.47	9.74	11.63
Rural group 8	2.20	4.87	8.58	8.88	10.78	2.41	5.25	9.81	10.12	12.01
Rural group 9	1.93	4.51	8.12	8.54	10.36	2.18	5.32	9.49	9.88	11.74
Rural group 10	1.66	3.88	7.09	7.53	9.14	2.19	6.07	9.86	10.24	12.04

Source: Authors' calculation.

**Table 7. Effect on the trade direction of Vietnam**

	Imports					Exports				
	S1	S2	S3	S4	S5	S1	S2	S3	S4	S5
China	-11.55	167.60	95.22	91.75	83.56	-6.51	156.86	132.17	103.02	71.79
Indonesia	134.86	75.88	20.88	17.34	3.34	21.35	16.30	13.19	23.54	30.80
Malaysia	94.03	45.13	3.42	2.94	-5.89	4.81	-9.47	-13.22	-14.74	-18.97
Philippines	112.14	79.52	13.85	9.70	8.30	112.06	102.58	88.74	93.39	87.54
Thailand	143.97	41.75	6.32	6.99	4.00	167.44	152.52	118.08	114.84	87.64
NIES	-12.04	-29.78	29.43	29.30	26.68	-6.58	-11.67	20.05	17.48	3.05
Japan	-13.34	-37.12	-13.82	-12.57	-12.73	-8.56	-10.82	12.75	6.28	-4.98
NAFTA	-2.45	-5.89	-8.72	-1.90	1.99	-7.29	-11.27	-12.26	29.92	17.90
EU	-4.25	-11.62	-16.29	-15.38	-2.95	-2.26	-4.59	0.15	-2.07	24.61
Rest of the World	-5.55	-11.02	-20.67	-20.37	-4.87	-5.82	-10.44	-9.57	-7.58	7.61
ASEAN-4	124.95	50.34	8.23	7.60	0.87	95.24	83.25	66.21	67.36	56.25
ASEAN-4 plus China	55.20	110.25	52.68	50.59	43.12	55.66	111.89	91.87	81.24	62.29
East Asia	11.43	18.27	29.91	29.34	25.44	10.37	24.06	37.43	30.85	16.51
Total	3.15	4.62	10.87	11.78	15.39	1.73	5.31	12.31	13.91	18.24

Source: Authors' calculation.

Vietnam's exports. As in S1, the China-ASEAN free trade area appears to have a positive impact on income distribution and poverty reduction. All household groups have gains in income and consumption, the poor having larger gains than the rich. Rural household groups also benefit more than urban groups. The establishment of free trade area between China and ASEAN, however, causes a considerable trade diversion to Vietnam. Imports from China and exports



to China rise sharply at the expense of trade with other regions. The biggest falls are seen in imports from Japan and East Asian NIEs, which decline by 37% and 30%, respectively, from the base-run values.

In simulation S3, we examined the effect of the possible formation of the East Asian economic community. In this simulation, we removed all tariffs on bilateral trade between East Asian countries, including Japan and East Asian NIEs. Bilateral trade between East Asian countries increases, and both exports and imports rise in all countries. The establishment of the East Asian free trade area, however, causes a trade diversion to the EU and North America where there is a slight decline in exports and imports. All East Asian countries experience a gain in income and consumption, and real GDP increases, with the exception of Thailand, China and Vietnam.

The welfare gain for Vietnam increases significantly as regional integration is expanded to include Vietnam's large trading partners such as Japan and East Asian NIEs. The inclusion of Japan and East Asian NIEs benefits mostly agriculture and labor-intensive industries in Vietnam, since the corresponding tariffs employed by Japan and East Asian NIEs are relatively high. Household consumption and income rise by 9.1% and 8.1%, respectively. Income to unskilled labor rises more than income to capital and skilled labor, and benefits mostly poor and rural household groups. In terms of trade direction, Vietnam's trade is diverted from the US and the EU. Their exports to Vietnam fall by 8.7% and 16.3% respectively. Both exports to and imports from East Asian NIEs rise, while imports from Japan fall to a lesser extent compared with S2.

In simulation S4, we removed the tariffs on bilateral trade between North America and East Asian countries. This simulation was designed to evaluate the effect of trade liberalization under the APEC forum, which has set the objective of liberalizing trade and investment regimes by the year 2020.<sup>13</sup> All APEC countries experience gains in income and consumption. Imports and exports increase in all APEC members but at the expense of the EU and the rest of the world. The removal of the NAFTA tariff brings additional welfare gains to Vietnam, where household income and consumption rise by 8.4% and 9.4% respectively. As may be expected, Vietnam's trade is redirected toward the APEC region, and trade with the EU and the rest of the world falls.

Finally, the effect of multilateral liberalization is considered in simulation S5, where tariffs were completely eliminated for all countries and regions. Exports and imports rise, and the total world exports increase by 3.4%. The welfare gain is also significant. Total world consumption rises by 0.9%, the equivalent of \$180 billion US. The tariff removal on a multilateral basis significantly increases the welfare gain for Vietnam, where household consumption increases by 11.2% and exports increase by 18.2%. Multilateral trade liberalization also reduces the extent of trade diversions caused by regional integration as it is seen in the previous simulations. The increase in Vietnam's imports from ASEAN members falls to less than 1.0%, while imports from the EU and North America still decline, but to a lesser extent compared with the previous simulations.

It should be stressed that the impacts on Vietnam, particularly on the pattern of trade and production, vary with the integration scenarios, depending on whether the countries and regions

<sup>13</sup> In this simulation, we assume tariffs are removed for only member countries. Indeed, as is commonly believed, the APEC forum adopts open regionalism, in which trade liberalization measures are applied to both member and non-member countries.

included are developing or are developed. For example, the participation of Japan in S3 has a great impact on the light manufacturing sector, which is a major export industry in Vietnam. The output and export of this sector increase by 18.4% and 24.5%, respectively.<sup>14</sup> A substantial expansion in the light manufacturing sector is also observed with the inclusion of NAFTA and the EU in S4 and S5. However, with the participation of China, a large developing country with an economic structure similar to Vietnam in S2, the simulation results show only a limited effect on the light manufacturing sector.

One of the main reasons for Vietnam to pursue regional integration and trade liberalization is the expectation that regional integration would stimulate the inflow of foreign investment through the improved economic environment and a greater market access for Vietnam's exports. The increasing competition among the developing countries for foreign investment also provides Vietnam with another incentive to quickly improve its investment environment. Even when we did not explicitly model capital inflows or outflows, the simulation results give some indication of the impact of regional integration on foreign investment. As can be seen in Table 5, capital rents in Vietnam increase in all simulations. Moreover, although it is not shown in detail, the increase in the capital rents in Vietnam is the highest compared with other regions or countries. Rising capital rents obviously imply an increase in foreign investment. To put it differently, regional economic integration and trade liberalization may make investment in Vietnam more profitable, and make Vietnam more attractive to foreign investors.

Despite the positive impacts on income distribution, export expansion and foreign investment, regional integration raises some macroeconomic issues for Vietnam. Real GDP falls in all simulations, although the GDP loss is not large. The decline in real GDP is largely due to the decline in government revenue and consumption following tariff reductions, and this fiscal loss is not fully offset by the increase in factor income. Since tariffs constitute a major source of fiscal revenue in Vietnam, tariff reductions can cause a sharp decline in fiscal revenue and should be accompanied by complementary tax policies to accommodate the loss in tariff revenue.<sup>15</sup>

In addition to fiscal issues, regional integration appears to have adverse impacts on the trade balance of Vietnam. In all simulations, the exchange rate depreciates in real terms, indicating a worsening of the trade deficit. Moreover, the real exchange rate depreciates most in the simulation of the ASEAN free trade areas, while it depreciates to a lesser extent in other simulations. The implication here is that the adverse impact on the trade balance would be smaller when regional integration is expanded to include Vietnam's large export markets such as Japan, the United States or the European Union. The possible adverse impact on the trade balance also indicates the need to adopting a flexible exchange rate during the process of regional integration.

## 6. Summary and conclusions

For this paper, we constructed a global CGE model, which specifies 10 industries and 11 countries and regions. We employed the model to examine the impact of the regional economic integration on Vietnam's economy, focusing on growth, poverty reduction and income

<sup>14</sup> The simulation results on the sectoral output and exports are not reported, but they can be obtained from the authors on request.

<sup>15</sup> In an effort to compensate for the loss in tariff revenue, the government of Vietnam has planned to raise the special sales tax imposed on cars and some other luxury goods. However, further tax reforms are needed to fully compensate for the revenue loss.

distribution. The impact of the trade liberalization and regional economic integration on Vietnam's economy is basically positive. The regional integration both enhances welfare and improves income-distribution for Vietnam. Household consumption and income rise significantly, the poor and rural groups gaining more than the rich. The removal of tariffs in trading partners provides a greater market access for Vietnam's exports, thereby contributing to the expansion of labor-intensive and export industries in Vietnam. Regional integration also increases the profitability of investing in Vietnam and helps in attracting foreign investment.

However, regional integration and trade liberalization also produces some outcomes that are undesirable in several aspects. In terms of growth, regional integration may cause real GDP to fall, largely due to the sharp decrease in tariff revenue. The fiscal and trade balance could be negatively affected by tariff reductions, so that the need to adopting complementary macroeconomic policies to mitigate the adverse impact of regional integration on the macroeconomy arises. As well, certain regional integration scenarios could significantly divert Vietnam's trade from its major trading partners. Adequate attention should be paid to the possibility of trade diversion and the different impacts resulting from various integration partners in establishing integration policies for Vietnam.

It is obviously desirable for Vietnam to pursue ongoing regional integration that includes the ASEAN free trade area and the recently established China-ASEAN free trade area. However, Vietnam should not confine itself to these trading areas. As the simulation results show, the gain from these trade areas is limited. The welfare gain for Vietnam could increase significantly when trade liberalization is carried out on a broader basis that involves Vietnam's major export markets. Broader regional integration also reduces the extent of possible trade diversions and further increases market access for Vietnam's exports.

The globally linked CGE model employed in this paper has proved useful in evaluating the impact of regional economic integration on Vietnam's economy. However, some limitations in the model remain; it needs further elaboration that it may better capture the characteristics of Vietnam's economy and regional economic integration. Among the possible extensions, we considered incorporating foreign capital inflows in our model. Allowing for international capital mobility would make it possible to quantify the changes in foreign direct investment resulting from regional economic integration, and this would probably further increase the welfare gain for Vietnam. In order to analyze the process of resource reallocation over time, we also considered performing some dynamic simulations, in which labor and capital are allowed to move between industries and countries.

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