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Goods trade liberalization under the ASEAN Economic Community: effects on the Philippine economy

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The economy-wide effects of the ASEAN Free Trade Area (AFTA) on the Philippine economy are computed using the Global Trade Analysis Project (GTAP) model of the world economy. Of the 40 industries representing the Philippine economy that were simulated to assess the impacts of AFTA on sectoral output, 24 industries declined. However, the order of magnitudes of the percentage declines is low, except for rice, whose output decreased by about 4.5 percent.

Notwithstanding the contraction of production in the majority of industries, the country comes out a net gainer in aggregate output by around 1.4 percent in total gross domestic product. This implies that, overall, the Philippines is slightly better off with the preferential trade liberalization, with an equivalent variation gain of US$237.4 million.

Considerable movement of workers across industries is observed. Reductions in skilled worker employment resulted in 31 industries, and 35 industries do the same in the case of unskilled labor. There is no change in unemployment due to the fact that the empirical model assumes full employment of productive factors. Given the fact that there is a change in employment patterns during trade liberalization episodes, it is important to assess the empirical relationship between trade liberalization and unemployment which remains difficult to pin down.

The empirical literature in developing countries shows that the employment response of trade reforms is dependent on infrastructure, trade facilitation measures, and other policies. Therefore, policies related to providing information and new market opportunities, organizing value chains, facilitating coordinated investments along the chain, clustering of related small and medium enterprises to boost external economies, and providing information to employers and workers of job opportunities, including training, are important.

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1. Introduction

This paper examines the economy-wide effects of goods trade liberalization in the Association for Southeast Asian Nations (ASEAN) region on the Philippine economy using the Global Trade Analysis Project (GTAP) model of the world economy. Goods trade liberalization is a key reform of ASEAN leaders under the ASEAN Economic Community (AEC). By transforming the region into a single market and production base, its leaders seek to make the region more competitive, attract more direct investments, generate more jobs, and increase productivity, trade, and per capita income growth.

However, as in every trade liberalization episode, many view the removal of tariff barriers as a process resulting in cheaper and ostensibly better quality imported products, resulting in the loss of domestic jobs. On the other hand, trade reforms are also seen as creating new markets for domestic products and creating more employment opportunities.

The two effects on employment are likely to happen in the process. Jobs are lost in some industries of the economy, and they are created in other industries. This study also provides a brief assessment of the suitability of general equilibrium economic models in estimating the net impact on jobs of goods trade liberalization under AEC.

Hill [2003:232] and Clarete [2006] noted that one of the development puzzles in the Philippine economy is that while trade reforms resulted in marginally better growth levels in the 1990s (at least compared to the previous decade), it did not trigger improvements in manufacturing employment. Several explanations that were explored include supply side constraints in the economy and the comparative lack of demand.

This article is divided into six parts. In the following section, the key policy reforms, including preferential trade liberalization, in AEC are discussed. The third section reviews the methodology used in computing the effects of tariff reforms. The results of the ex-ante analysis are in the fourth section of the paper. Considering that the ex-ante analysis abstracts from structural rigidities of the economy, the fifth section takes up the adjustment process to freer trade; the empirical and analytical assessments of the relationship between trade liberalization and employment effects are examined. Key observations and recommendations are provided in the concluding section.

2. Goods trade reforms in AEC

This section provides the context of goods trade liberalization in ASEAN. Even before the 2003 AEC declaration at Bali, ASEAN leaders had already declared the region to be a free trade area. AEC prohibited non-tariff barriers, introduced rules of origin and other non-tariff measures, and provided trade facilitation measures.

2.1. The ASEAN Free Trade Area

The agreement that created the ASEAN Free Trade Area (AFTA), which came into force in 1992, was signed during the period when the world "exploded" with free trade agreements [Soloaga and Winters 2001]. According to the World Trade Organization [2011], there hardly were any preferential trade agreements created between the 1950s and 1980s. It was in the 1990s that the number surged to about 70 agreements, and then it rose to 300 agreements in 2010.

Under the agreement that launched AFTA, member countries were required to reduce the trade taxes imposed on goods imported from their fellow member countries. Brunei, Indonesia, Malaysia, the Philippines, Singapore, and Thailand, collectively known as the ASEAN-6, initially comprised the ASEAN membership. Cambodia, Lao People's Democratic Republic (or Lao PDR), Myanmar, and Vietnam, known as the CLMV countries, subsequently joined the regional bloc. This Common Effective Preferential Tariff (CEPT) Scheme, which AFTA called the system of tariffs that would be imposed on the products imported from the other ASEAN member countries, ensured that the tariff rates would be brought down at zero to five percent rates, in a time frame of eight years from the signing of the agreement.

The rules of origin were also agreed upon in the trade agreement. This meant that the goods, excepting for some commodities, would be subject to preferential trade and should have a local content of at least 40 percent of the freight on board. It was also agreed that quantitative restrictions would be removed on goods whose tariffs would be reduced and all other non-tariff measures related to these products would be reduced in a five-year period.

With the entry of the CLMV countries, the free trade agreement was reaffirmed in November 1999 when ASEAN agreed to implement a reduction of tariffs to zero by 2010 for the ASEAN-6 and by 2015 for CLMV countries. Products in the priority sectors, especially in the manufactured goods sectors, would be eliminated by 2007 for the ASEAN-6 and by 2012 for the CLMV, while all tariffs would be eliminated by 2015 for the ASEAN-6 and by 2018 for the CLMV countries.

2.2. Leap to AEC

The transformation of AFTA into an "economic community" took place in 2003 with the Bali declaration. ASEAN leaders adopted the vision of creating a "single market and production base" in order to make the regional economy "stable, prosperous, and highly competitive" [ASEAN 1997] as one of the three pillars of regional cooperation, including security, sociocultural integration, and economic integration, as agreed upon in the ASEAN Concord (Bali Concord II).

During the ASEAN Summit in Cebu in January 2007, which developed the AEC Blueprint, the deadline for integration was brought forward from 2020 to 2015. Because of this, the ASEAN Trade in Goods Agreement (ATIGA) was

signed in 2009, which formalized the tariff agreements that have been made in the past and improved the transparency and predictability of changes in tariffs. ATIGA also emphasized trade facilitation measures with a work plan to be put in place from 2009 to the start of AEC in 2015.

2.3. Goods trade reforms under AEC

ATIGA also emphasized trade facilitation measures with a work plan to be put in place from 2009 to the start of AEC in 2015. Besides tariff reduction, the following are the significant provisions of ATIGA and the ancillary agreements: elimination of non-tariff barriers [De Dios 2007]; continuous reform of the rules of origin rules; implementation of harmonized trade facilitation processes; establishment of an ASEAN single window to expedite clearance processes for trade flows; and harmonization of standards and technical barriers to trade.

2.3.1. Tariff reforms

The AFTA agreement came into force in 1992, which aimed, among other purposes, to reduce intra-regional import tariffs to no more than five percent under the CEPT Scheme. However, the scheme allowed members to draw up their respective Inclusion List, Sensitive List, Highly Sensitive List, General Exclusion[1] List, and tariff reduction schedules. The new member states—Cambodia, Lao PDR, Myanmar, and Vietnam (or CLMV)—were given flexibility in terms of a longer implementation period than the ASEAN-6.

In 1995, ASEAN leaders decided to accelerate the CEPT process by moving the completion date from 2008 to 2003. The tariff rates on sensitive imported products from the region were eventually phased into the CEPT process. Member states were legally bound to reduce the tariff rates on these products to no more than 5 percent. For ASEAN-6, the target year of completion of the CEPT process for Sensitive List imports was 2010 and 2015 for CLMV states.

The 2007 AEC Blueprint affirmed the agreements of member states regarding the parameters of the preferential tariff reforms, i.e. the target rates, deadlines, and schedules of tariff reduction. Nonetheless, the blueprint emphasized the urgency of these reforms and desirability of minimizing the cases of departure from the agreed tariff reduction schedules. The blueprint extended the CEPT Scheme to 2015 for ASEAN-6 and up to 2018 for CLMV states to cover for the integration of Sensitive List imports into the CEPT Scheme, as well as to set the final tariff rates on Highly Sensitive List products.

[1] General Exclusion List products are permanently exempted from the tariff reduction process to uphold national security, public morals, and public health, as well as protect the environment and articles of artistic, historic, or archaeological value (ASEAN Secretariat, 1999).

As part of its commitments to ASEAN, in December 2009, the Philippines passed Executive Order No. 850[2] which removed tariffs on imports from ASEAN, except for products in the Sensitive List and Highly Sensitive List. Approximately 94 percent of tariff lines in the country's Tariff Reduction Schedule is already set to 0 percent.

Agricultural tariffs remain high in the Philippines. The average tariff of dutiable agricultural and fisheries products in 2013 is 13.01 percent, which is set to fall to 10.23 percent by 2015. This is due to the feature of the country's CEPT that reduced the tariffs of its Sensitive List imports down to only 5 percent, which is an acceptable ending rate of the CEPT. The Philippine Sensitive List includes swine, poultry, cassava, sweet potatoes, corn, grain sorghum, and sugar for the detailed list. Except for sugar, the tariff rates of products in the Sensitive List are already down to 5 percent since 2010. Rice is the only item in the Philippine Highly Sensitive List. Based on the Tariff Reduction Schedule, rice and sugar tariffs go down to 35 percent and 5 percent respectively in 2015.

The reduction and elimination of tariffs in ASEAN has been considered successful. As of 2010, intra-ASEAN tariff rates were virtually zero in the ASEAN-6, and 2.6 percent was the mean preferential tariff rate under ATIGA in the newer CLMV member states. By 2015, rates on 98 to 100 percent of all tariff lines are expected to be in the 0-5 percent range. Table 1 shows the percentage of tariff lines with 0 percent tariff as of 2013 for each of the ASEAN countries. According to ASEAN Secretariat, 99.85 percent of regional tariffs of ASEAN-6 member states are zero, while the corresponding number for newer ASEAN members was 69 percent. About 30 percent of the goods in the CLMV currently have rates greater than zero, while slightly over a third of a percent is observed for the ASEAN-6. The residual share of tariff lines is for those not offered for preferential reduction, and these tariffs apply to products in the General Exclusion List. The General Exclusion List tariff lines for the Philippines is nearly a third of slightly over a quarter of 1 percent and 0.45 percent or the ASEAN-6 states.

2.3.2. Elimination of non-tariff trade barriers

Quantitative restrictions to imports, whether explicit or not, are non-tariff trade barriers (NTBs) and are thus prohibited under ATIGA. Under the AEC Blueprint, all member states are to commit not to expand the number of NTBs they maintain and to roll back any that they currently implement. In the interest of promoting transparency, the ASEAN member states commit to notify the ASEAN Secretariat

[2] "Modifying the Rates of Duty on Certain Imported Articles as Provided Under the Tariff and Customs Code of 1978, As Amended in Order to Implement the Commitment to Eliminate the Tariff Rates on the Remaining Products in the Inclusion List in Year 2010 Under the Common Effective Preferential Tariff (CEPT) Scheme for the ASEAN Free Trade Area (AFTA)/ASEAN Trade in Goods Agreement (ATIGA)"

of their respective use of NTBs. The secretariat has to maintain an effective surveillance mechanism to monitor the implementation of NTBs and non-tariff measures. Member states are legally bound to eliminate all NTBs by 2010 for ASEAN 5, and by 2012 for the Philippines, although this had already changed because of the June 2014 waiver.[3] The CLMV states have until 2018 to remove the NTBs that they maintain.

TABLE 1. Percentage of tariff lines at 0 percent in the ATIGA tariff schedule of 2013

	Percentage of tariff lines (%)		
Country	**0%**	**Greater than 0%**	**Other[1]**
Brunei	99.27	-	0.73
Indonesia	98.87	0.17	0.96
Malaysia	98.74	0.59	0.66
Philippines[2]	98.62	1.11	0.27
Singapore	100.00	-	-
Thailand	99.85	0.15	-
ASEAN-6	99.20	0.35	0.45
Cambodia	40.77	59.23	-
Lao People's Democratic Republic	78.73	20.36	0.91
Myanmar	79.66	19.69	0.65
Vietnam	72.24	25.77	1.99
CLMV	68.88	30.20	0.92

Source: ASEAN Secretariat [undated]

2.3.3. Trade facilitation

With tariff rates and NTBs eliminated in the region, the agenda for closer integration in goods trade is increasingly focused on the harmonization and efficient administration of the various regulations and para-taxes that affect international trade.

ASEAN [2011] determined the major NTBs in the region. The first category comprises customs surcharges. In a survey conducted, ASEAN reported that about 70 percent of the NTBs implemented are customs surcharges. Technical measures, another category, make up 14 percent, followed by product characteristics requirement, 10 percent. The remaining 6 percent of observed NTBs included charges other than those collected by customs, state trading and single channel rules, marketing requirements, and technical regulations.

[3] The Philippines presently has a waiver from the World Trade Organization to continue to maintain the country's quantitative restrictions on rice imports in the form of the monopoly of rice imports under the National Food Authority. The 2012 deadline for the Philippines to eliminate its non-tariff barriers reflected the country's original plan not to extend its quantitative restrictions for rice after it would have expired in 2012. The government changed plans and decided to apply for a waiver from the World Trade Organization.

Non-tariff measures regulate the flow of trade to act on observed problems that international trade may inadvertently cause. An important category is the set of sanitary and phyto-sanitary standards and regulations on traded plant and animal-based products. These ensure that imported foods, feeds, planting materials, and breeding stocks are safe for consumption or for use by the public, or that their entry into the country does not introduce diseases and pests to native plants and animals.

In non-agricultural products, governments require that imports meet their respective standards and conform to existing regulations. These standards and regulations mitigate the risk of substandard imports that may jeopardize public interest.

Because of the preferential nature of trade liberalization under ASEAN, rules of origin have become part of the free trade area rules to determine eligibility and to mitigate risk of trade deflection. ATIGA states that the administration of rules of origin be kept simple and continuously responsive to the requirements of private businesses in the region, particularly with respect to promoting regional and global value chains.

The AEC Blueprint has also called for the modernization of customs procedures and regional integration of national customs administration, which are set in the ASEAN cargo clearance and customs declaration document [ASEAN 2007].

Another important contribution to facilitating trade is the harmonization of standards, technical regulations, and conformity assessment procedures. The AEC Blueprint calls on member states to work together to develop and implement such harmonized systems of standards and technical regulations based on international best practices. Trade facilitation programs, required by ATIGA, are intended to avoid or mitigate any adverse effects of administering non-tariff measures, whether it is before the goods arrive or are exported, during cargo clearance at customs, or after cargoes are cleared.

Another area that AEC is focusing on is improving transparency of regulations. AEC calls for the establishment of a region-wide ASEAN Trade Repository of existing trade regulations, where information on regulations of member states is accessible to stakeholders.

The AEC Blueprint provides for measures that reduce trade costs. It calls on member states for collective action through the ASEAN Secretariat to undertake studies on trade and to implement a comprehensive work program in order to simplify, harmonize, and standardize trade licensing and cargo clearance processes and procedures.

3. Structure of the model

A computable general equilibrium model of the global economy is used in analyzing the impact of AEC tariff reforms. The model allows the tracking of the economy-wide effects of changes in ASEAN tariff protection in a way that takes

into consideration their effects on global markets of products and in turn their feedback to its component national economies.

3.1. Production structure

The model comprises 40 production sectors and 23 countries/regions of the world. Table 2 lists and classifies the production sectors of the model by broader sector categories that they belong to, namely agriculture, natural resources, manufacturing, and services. There are nine primary agricultural production activities. Forestry, mining and oil, and gas are three natural resource extraction activities. There are 19 manufacturing activities and nine services industries.

Each of the 40 sectors produces only one unique product. The production activity for each sector is modeled by a nested Leontief-constant elasticity of substitution production function, i.e., there are several input-to-output transformation processes at various levels of the production activity (see Figure 1).

At the top level, the activity's output is a nested function of two composites, one for intermediate inputs and the other for primary inputs or value added. The former in turn depends upon another set of composites, called Armington [1969] goods, with each good or service made up of a locally produced input and its imported equivalent, which are substitutable subject to a constant elasticity of substitution parameter.

Value added is a function of primary factors of which there are four in the model: labor; skilled labor; land; and capital. These inputs are constant elasticity of substitution-substitutable among themselves, i.e., they substitute with each subject to a constant elasticity of substitution parameter. All primary factors are free to be moved from one industry to another. However, land is an input in only agricultural production activities, and it is freely movable among the latter.

The outputs are used for final consumption, exports, and intermediate inputs into Armington composites. Both final and intermediate uses of the product are sales to the domestic markets. Output is split between domestic sales and exports through a constant elasticity of transformation parameter.

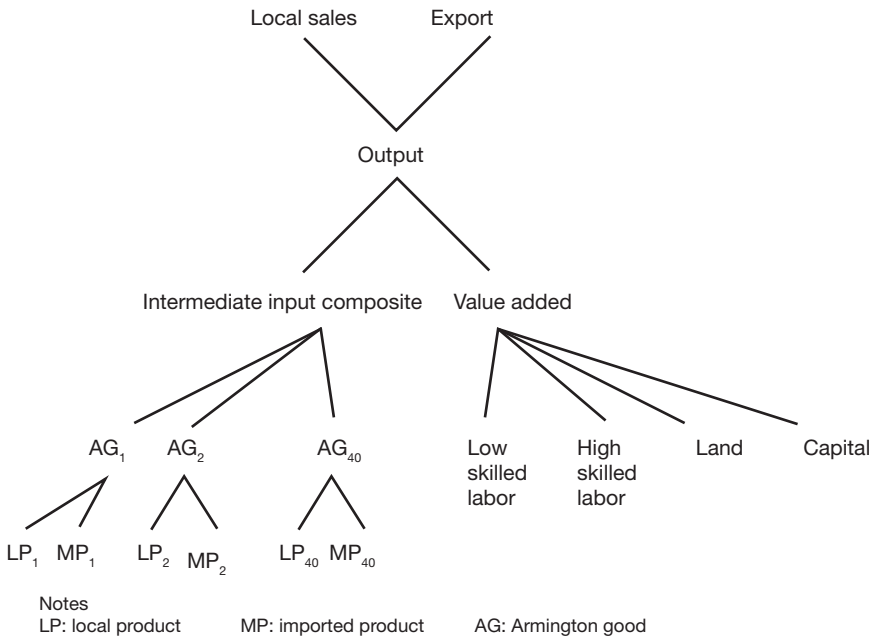
3.2. Demand structure

Twenty-three countries or regions represent the global economy (see Table 4). Fifteen of these regions are in Asia, with Southeast Asia having the most number of individual countries represented. Of the 10 ASEAN member states, Cambodia and Lao People's Democratic Republic are grouped as one region, while Myanmar, Brunei Darussalam, and East Timor make up the rest of Southeast Asia.

TABLE 2. The production sectors of the model

1.	Paddy rice	A	21.	Wood products	M
2.	Cereals	A	22.	Paper and publishing	M
3.	Oil seeds	A	23.	Leather	M
4.	Sugarcane and beets	A	24.	Chemicals, rubber, and plastic	M
5.	Vegetables and fruits	A	25.	Petroleum and coal	M
6.	Other crops	A	26.	Non-metal mineral products	M
7.	Other animal products	A	27.	Metal products	M
8.	Cattle	A	28.	Machinery products	M
9.	Fishery	A	29.	Electrical products	M
10.	Forestry	NR	30.	Transport equipment	M
11.	Mining	NR	31.	Other manufacturing	M
12.	Oil and gas	NR	32.	Construction	S
13.	Meat preparations	M	33.	Fuel, electricity, and water	S
14.	Dairy	M	34.	Transport services	S
15.	Vegetable oils	M	35.	Trade	S
16.	Processed rice	M	36.	Communications	S
17.	Milled sugar	M	37.	Financial intermediary	S
18.	Other food products	M	38.	Public administration, education, and health	S
19.	Beverages and tobacco	M	39.	Real estate and commercial services	S
20.	Textile and garments	M	40	Rest of services	S

Abbreviations
A: agriculture NR: natural resources M: manufacturing S: services



Notes
LP: local product MP: imported product AG: Armington good

FIGURE 1. Structure of production activities of the model

TABLE 3. The geographical regions of the model

1.	Indonesia	SEA	13.	India	SA
2.	Cambodia and Lao People's Democratic Republic	SEA	14.	Rest of South Asia	SA
3.	Malaysia	SEA	15.	Australia and New Zealand	ANZ
4.	Philippines	SEA	16.	Canada	A
5.	Singapore	SEA	17.	United States of America	A
6.	Thailand	SEA	18.	Brazil	A
7.	Vietnam	SEA	19.	Rest of North and South Americas	A
8.	Rest of Southeast Asia	SEA	20.	European Union 27	EU
9.	China	EA	21.	Middle East and North Africa	MENA
10.	Hong Kong and Taiwan	EA	22.	Rest of Africa	Af
11.	Japan	EA	23.	Rest of the World	ROW
12.	South Korea	EA			

Abbreviations
SEA: Southeast Asia EA: East Asia SA: South Asia A: Americas

Each region has a representative private household and a government. Both are treated in the model as maximizing a utility function subject a budget constraint, with the latter having a Cobb-Douglas utility function.

The representative regional consumer draws its income from its ownership of the four primary factors of the model, and income transfers from the government and the rest of the world. After deducting the taxes it pays to the government, the consumer then apportions the disposable income to savings and consumption. The government's income comes from taxes collected and spends it on local and imported products. Savings in the model are pooled by a global financial intermediary, and are allocated to the various regions based on their respective investment financing requirements.

3.3. Equilibrium conditions

The computable general equilibrium modeling structure of GTAP entails the latter observing accounting relationships that correspond to the various conditions that define when the global and regional economies are in a state of equilibrium or balance, utilizing a regional household and a global bank.

The regional household receives and allocates income and expenditure flows. It receives the incomes of the primary factors in consideration of the use of the respective services of these factors in producing goods and services. It also receives taxes, paid by the private household and the government when they buy goods and services, of which there are two types. Internal income and indirect tax revenues are those from taxes on local purchases, and trade taxes are those from imports and exports of goods and services. The border taxes are the revenues from import tariffs, export taxes, and other related tax measures collected at the border.

The regional household spends all its income on two income transfers and savings. One of the two transfers goes to the private household, and the second is given to the government. These transfers then figure out as the respective budgetary constraints of the two when they maximize their respective utility functions as discussed above. The savings that the regional household generates goes to a global bank. The bank pools the savings from all regional households of the model and allocates the total across various competing uses of the savings by the regions. The manner how this is allocated is that all regions with competing uses of savings face the same terms of use.

3.4. Global Trade Analysis Project data and model

The data used in the study comes from version 8. 1 of the GTAP data [in Narayanan, Bardi, and McDougall 2012]. The GTAP 8.1 data set comprises a total of 137 countries and 57 sectors. The Center for Global Trade Analysis at Purdue University maintains and regularly updates the data set since 1993 [Hertel 1999]. The baseline year is 2007.

This study used the GTAP model in computing the impacts of AEC tariff reforms. It is a multi-regional and multi-sectoral model, and it is used in counterfactual analysis such as on the possible implications of the policy changes (Hertel [1999]; Brockmeier [2001]). The GTAP model is set up as one that can be solved using GEMPACK [Harrison and Pearson 2002]. GEMPACK solves for percentage changes of the economic variables following a change of policies.[4]

4. Economic effects of AFTA

4.1. Production effects

Table 5 portrays the changes of production outputs, measured in billions of pesos, for each of the 40 production sectors of the GTAP model. These changes reflect how the resources of the economy get to be reallocated in the economy as a result of lower preferential tariff protection in ASEAN.

With lower protection, Philippine industries lose their domestic markets to imported substitutes and thus reduce their outputs, as shown in the Table 4. Altogether, 24 industries, or more than half of the total, are observed to contract production.

The order of magnitudes is in the range from less than a percent to up to 4.5 percent. These are rather low changes, except for rice, whose output decreased by about 4.5 percent. This is despite the fact that rice continues to have the highest ASEAN tariff rate of 35 percent.

[4] An alternative solution technique is to solve for the counterfactual values of the economic variables of the model. For this, modelers use the GAMS software, and a version of the model in GAMS was developed by Rutherford [2005].

TABLE 4. Effects of AFTA on production, by industry, Philippines* (in billions of pesos)

Sectors	Base value	Change %	Sectors	Base value	Change %
Paddy rice	142.36	-4.58	Wood products	86.28	-1.63
Cereal	56.64	-0.40	Paper and publishing	96.28	0.07
Oil seeds	35.84	-1.02	Leather	30.28	-0.94
Sugar cane and beets	25.48	-1.83	Chemicals, rubber, and plastic	327.6	-0.86
Vegetables and fruits	140.72	-0.18	Petroleum and coal	260.56	0.30
Other crops	43.96	15.13	Non-metal mineral products	87.28	0.28
Other animal products	227.96	0.17	Metal products	341.76	0.90
Cattle	28.12	0.35	Machinery products	438.24	-1.36
Fishery	180.08	-0.03	Electrical products	1912.04	-1.56
Forestry	14.52	-1.15	Transport equipment	246.32	16.54
Mining	92.52	-0.92	Other manufacturing	117.32	-0.62
Oil and gas	13	-0.91	Construction	388.4	1.29
Meat preparations	278.56	0.06	Fuel, electricity, and water	388.4	0.00
Dairy	52.56	0.45	Transport services	585.64	0.08
Vegetable oils	83.52	-1.82	Trade	1232.68	0.14
Processed rice	141.28	-4.78	Communications	213.92	-0.12
Milled sugar	43.8	-1.95	Financial intermediary	396.48	0.11
Other food preparations	430.64	-0.17	Public administration, education, and health	812.72	-0.05
Beverages and tobacco	130	4.62	Real estate and commercial services	724.72	-0.32
Textile and garments	278.56	-0.97	Rest of services	217.48	-0.16
All sectors				11,344.60	1.41

Note: Shaded entries are those for industries with increases of their respective outputs.
Source: Authors' computations

The economic resources they lost went to the 15 industries.[5] Transport equipment increased the greatest with an increase of 16.54 percent. Although its component production activities have very low base values, the other crops industry increased its output by 15.13 percent. Beverages and tobacco comes second with growth of 4.62 percent. The overall production of the economy went up by 1.41 percent. In the non-agricultural industries and services, transport equipment and construction show significant expansion of their outputs.

The Philippines, despite the output contraction of 24 or more than half of its industries, comes out a net gainer in aggregate output. With a base value of aggregate output at ₱11.3 trillion, the country comes out of this tariff liberalization process as gaining by 1.41 percent. The gains more than outweigh the losses in aggregate production in the economy.

[5] No change in output is observed for the fuel, electricity, and water industry.

4.2. Employment effects

Given the changes in output, considerable movement of workers across industries is observed from the results (see Table 5).[6] Thirty-one (31) out of forty industries contract employment of skilled workers, and 35 industries do the same in the case of unskilled labor. In agriculture and natural resources, ten out of 12 industries lay off skilled workers. Rice paddy, sugar cane, and oil seeds cut back on skilled labor employment by at least 1 percent. The other crops industry appears to absorb those displaced with an expansion of hiring at the rate of 16.22 percent.

Thirteen (13) out of 20 manufacturing industries give up skilled workers to other industries. In the case of low-skilled labor, 15 industries are observed to do the same. The industries with the largest layoff rates are agriculture-based, namely milled rice, milled sugar, and vegetable oils. Six and seven industries in the case of skilled and low-skilled workers, respectively, follow, whose layoff rates are between a percent and two, except for the wood products industry that cut back on low-skilled workers employment by 2.13 percent. The rest of manufacturing cut back on employment by less than a percent.

The manufacturing industries that increase employment of skilled workers are the following: dairy; beverages and tobacco; petroleum and coal; non-metal mineral products; metal products; transport equipment; and construction. The same industries increase as well their employment of low-skilled workers, except for petroleum and coal, non-metallic mineral products, and dairy industries, which shed off jobs albeit at less than a percent.

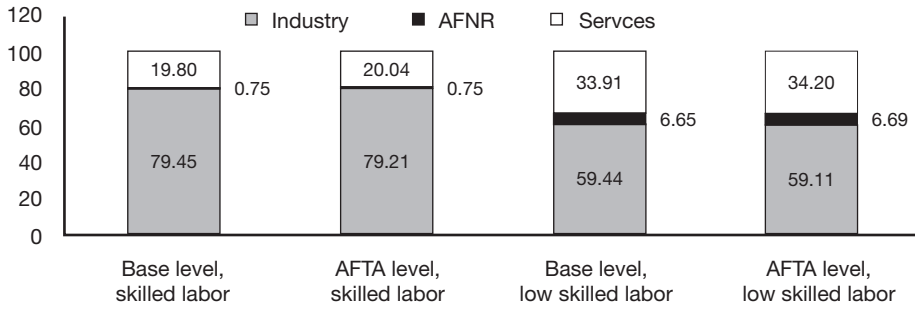
All eight services industries lay off workers, but the rates of change are all less than a percent. This is due to the fact that there are services industries that contracted output; these include communication, public administration, real estate and commercial services, and the rest of services. These output cutbacks may explain the reduction in employment reported in Table 5. However, the remaining three services industries expanded production, and fuel, electricity and water utility neither contracted nor expanded their output. But all four services industries gave up workers despite the lack of output contraction.

[6] In Table 6, entries colored green show the industries that increase employment of workers. Under the allocation columns, shares that are less than a percent are not shaded. Those industries having shares between 1 and less than 4 are shaded light red, while light green is used to shade entries with shares of at least 4 percent.

TABLE 5. Employment changes and allocation of labor by industry, baseline and simulated levels due to AFTA tariff reforms (in %)

Industry	Employment changes		Share of sector in employment			
			Skilled workers		Low-skilled workers	
	Skilled workers	Low-skilled workers	Baseline	AFTA	Baseline	AFTA
Paddy rice	-5.29	-5.46	0.004	0.004	0.251	0.237
Cereal	-0.77	-0.95	0.029	0.029	0.566	0.561
Oil seeds	-1.44	-1.63	0.011	0.011	0.239	0.235
Sugar cane and beets	-2.32	-2.51	0.003	0.003	0.076	0.074
Vegetables and fruits	-0.53	-0.71	0.052	0.052	1.687	1.675
Other crops	16.22	16.01	0.035	0.041	0.625	0.725
Other animal products	-0.15	-0.34	0.021	0.021	0.623	0.621
Cattle	0.04	-0.15	0.034	0.034	0.693	0.692
Fishery	-0.35	-0.54	0.006	0.006	0.233	0.232
Forestry	-1.46	-1.64	0.013	0.013	0.336	0.330
Mining	-1.24	-1.41	0.234	0.231	0.665	0.655
Oil and gas	-1.45	-1.64	0.310	0.305	0.660	0.649
Meat preparations	-0.16	-0.44	0.167	0.167	0.516	0.514
Dairy	0.23	-0.06	0.114	0.115	0.322	0.322
Vegetable oils	-2.04	-2.32	0.035	0.035	0.103	0.101
Processed rice	-4.99	-5.26	0.020	0.019	0.065	0.061
Milled sugar	-2.17	-2.45	0.037	0.036	0.093	0.091
Other food preparations	-0.39	-0.67	0.659	0.656	1.371	1.362
Beverages and tobacco	4.38	4.07	0.279	0.291	0.568	0.591
Textile and garments	-1.18	-1.47	0.479	0.473	1.505	1.483
Wood products	-1.83	-2.13	0.364	0.357	0.974	0.954
Paper and publishing	-0.15	-0.45	1.214	1.212	1.721	1.713
Leather	-1.15	-1.44	0.089	0.088	0.291	0.287
Chemicals, rubber, and plastic	-1.08	-1.37	2.173	2.150	2.670	2.634
Petroleum and coal	0.09	-0.21	0.110	0.110	0.170	0.169
Non-metal mineral products	0.06	-0.24	0.479	0.479	1.096	1.094
Metal products	0.69	0.39	1.613	1.624	3.356	3.369
Machinery products	-1.57	-1.87	3.957	3.895	4.257	4.177
Electrical products	-1.77	-2.07	0.908	0.892	1.170	1.146
Transport equipment	16.28	15.91	1.768	2.056	2.575	2.985
Other manufacturing	-0.83	-1.11	0.377	0.374	0.891	0.881
Construction	1.10	0.78	4.957	5.011	10.189	10.269
Fuel, electricity, and water	-0.23	-0.53	1.434	1.430	1.468	1.460
Transport services	-0.10	-0.45	2.337	2.335	4.807	4.786
Trade	-0.04	-0.39	7.507	7.504	14.894	14.836
Communications	-0.35	-0.64	2.289	2.281	1.389	1.380
Financial intermediary	-0.12	-0.42	9.481	9.470	4.861	4.841
Public administration, education, and health	-0.30	-0.59	36.753	36.643	20.660	20.537
Real estate and commercial services	-0.55	-0.84	15.348	15.264	8.930	8.855
Rest of services	-0.39	-0.68	4.300	4.283	2.432	2.416
Total			100.000	100.000	100.000	100.000

Note: Shaded entries are those for industries with increases of their respective outputs.
Source: Authors' computations



Note: Agriculture, fishery and natural resources (ANFR)
Source: Table 5

FIGURE 2. Allocation of skilled and low-skilled labor, base and simulated levels due to AFTA tariff rates (%)

4.3. Effects on trade

Table 6 shows the changes to the country's exports and imports that AFTA may bring about. In agriculture, fishery and natural resources, the top exporting industries are vegetables and fruits, mining, other crops, and fisheries industries.

Altogether, the agriculture and fisheries industries come out with a positive net gain in exports at US$183.64 million. The country's exports in vegetables and fruits decline by nearly a percent. Other crops industry registered to have the highest expansion rate at 280.8 percent. The base value is relatively significant, but this industry is a collection of several crops not elsewhere specified, each of which may have relatively low levels of exports.

The three natural resources industries suffer cuts of their respective export levels, except for oil and gas. This sector's gain is inadequate to offset export losses in mining and forestry. Mining is a far significant exporter than oil and gas. The loss of natural resources exports amounts to US$10.7 million, mostly in mining.

It's in the manufacturing sectors that the country gains relatively the most in exports, altogether nearly US$405.4 million. Nine out of 20 industries are observed to have reduced their exports. The biggest exporter, electrical products, with base export value of more than US$41.8 billion, experience a 1.59 percent decline of its exports.

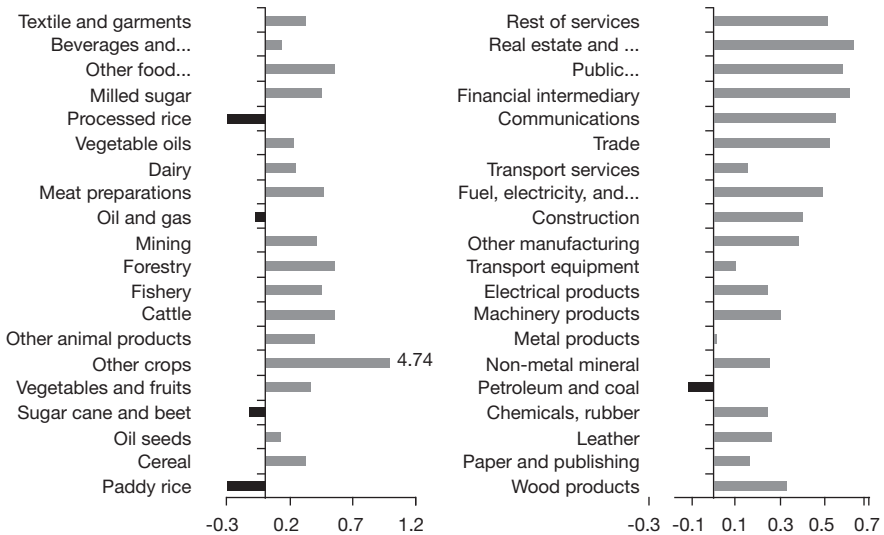
The gainers more than offset the losses of the three large export performers. Automotive spare parts, under transport equipment, have a significant gain, 47.87 percent, and their base export value is about US$2 billion. Although it expands only by a percent, metallic products industry has a large base export value of US$3 billion.

TABLE 6. Effects of AFTA on Philippine exports and imports, by industry* (in million US$)

Industry	Base export values	Change (%)	Base import value	Change (%)
Paddy rice	0.0	9.09	0.0	-6.77
Cereal	1.8	0.4	1.9	0.32
Oil seeds	1.5	-0.59	1.5	0.47
Sugar cane and beets	0.0	0.5	0.0	-0.55
Vegetables and fruits	792.0	-0.81	943.0	1.26
Other crops	68.0	280.79	73.2	15.29
Other animal products	11.4	-1.01	11.9	0.58
Cattle	0.0	-3.52	0.0	1.92
Fishery	121.0	-0.63	136.0	3.3
Forestry	3.8	-2.39	4.2	0.15
Mining	1,295.0	-0.82	1,682.0	1
Oil and gas	0.4	2.9	0.4	0.34
Meat preparations	56.9	9.82	58.0	2.16
Dairy	146.0	7.47	159.0	1.19
Vegetable oils	768.0	-1.22	808.0	2.02
Processed rice	21.9	3.96	21.9	20.62
Milled sugar	90.4	1.58	98.2	36.97
Other food preparations	1,043.0	0.86	1,138.0	2.8
Beverages and tobacco	165.0	76.79	172.0	1.35
Textile and garments	2,648.0	-1.11	2,792.0	0.97
Wood products	1,112.0	-1.38	1,237.0	3.8
Paper and publishing	228.0	3.1	252.0	1.42
Leather	151.0	-0.27	163.0	2.13
Chemicals, rubber, and plastic	1,687.0	-0.48	1,833.0	0.99
Petroleum and coal	812.0	4.23	860.0	0.88
Non-metal mineral products	298.0	0.5	350.0	2.95
Metal products	3,028.0	1.0	3,119.0	2.14
Machinery products	5,415.0	-1.55	5,613.0	1.74
Electrical products	41,858.0	-1.59	42,331.0	-0.96
Transport equipment	2,094.0	47.87	2,190.0	6.76
Other manufacturing	527.0	-2.07	556.0	2.28
Construction	113.0	-1.46	113.0	2.05
Fuel, electricity, and water	141.0	-2.53	141.0	1.26
Transport services	3,160.0	-0.43	3,160.0	0.46
Trade	651.0	-1.83	651.0	1.08
Communications	579.0	-1.98	579.0	1.06
Financial intermediary	349.0	-2.26	349.0	1.28
Public administration, education, and health	367.0	-2.16	367.0	1.15
Real estate and commercial services	2,653.0	-2.29	2,653.0	0.96
Rest of services	470.0	-1.89	470.0	0.08
All Sectors	72,927.1	0.62	75,088.2	0.32

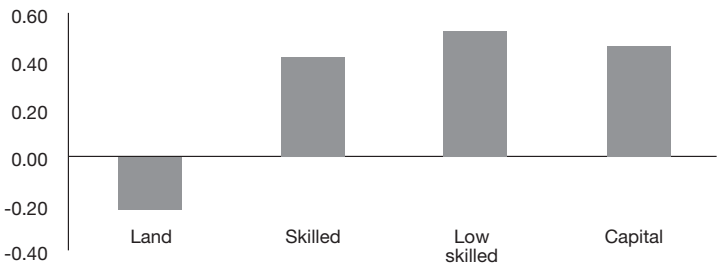
Note: Shaded entries are for industries that expanded their levels of trade due to AFTA tariff reforms.
Source: Authors' calculations

All eight services industries have reduced exports, and together lose about US$126 million. Transport services and real estate and commercial services industries are among the country's largest services exporters. The former declines by less than half of a percent, while the latter's exports falls by 2.29 percent. Five out of the eight services sectors increase their export value by at least 2 percent. Summing up, the country gains US$452.36 million. The manufacturing industries take the lead in the country's exports, followed by agriculture and fisheries.



Source: Authors' calculations

FIGURE 3. Effects of AFTA on product prices (in %)



Source: Authors' calculations

FIGURE 4. Effect on returns to primary factors (in %)

In contrast, the country's import bill rises by US$241.26 million. The majority of the import activities expanded their activities, except for paddy rice, sugar cane, and electrical products. Electrical products, metallic products, machinery, textiles and garments, and transport equipment are the country's largest importers among the manufacturing industries. The reduction in imports in electrical products is the largest, and this result appears consistent with lower exports coming out of this industry. The overall exports increased by about .62 percent, while imports expanded by .32 percent. The country has a base trade deficit of US$2,161 million. In the simulated trade levels, the deficit is observed to go down by US$211 million.

4.4. Effects on prices

Figures 3 and 4 show the changes of the prices of goods and returns to the primary resources used in production. In Figure 4, all goods, except 5, gain increases in prices. That is, simulating the preferential tariff reforms results in pushing up world prices, albeit at different rates. The highest rate of increase, 4.74 percent, is observed for other crops. The order of magnitudes of price increases is up to about half of a percent.

Figure 4 shows the changes in returns to owners of resources used as primary inputs in the various production activities of the economy. Wages of both skilled and low-skilled workers rise by nearly half of a percent. Land rents, however, go down by about a fourth of a percent. Land is mostly used in agriculture and particularly in rice.

4.5. Overall economic effects

The changes in the country's gross domestic product and economic welfare are shown in Table 8, which provides information on the gross domestic product at constant prices which is the total value added generated by an economy. This is presented in million US dollars as the changes in other countries in the GTAP model are likewise shown for ease of comparison with that of the Philippines. As expected, ASEAN member states are better off with AFTA. The percentage changes are small, and this reflects the fact that the base year of GTAP is 2007 which is already just about the end of the CEPT process.

Is the Philippines better off with the preferential trade liberalization in goods under AEC? The equivalent variation, which measures the amount of money a country is willing to pay in order to be as well-off as having AFTA under AEC, in the last column of Table 7 is used to indicate the economic well-being of the country. Singapore tops the gainers, with US$2.4 billion, followed by Malaysia and the Philippines. The Philippines has an equivalent variation of US$237.4 million. With this figure, the reforms marginally benefit the country.

TABLE 7. Changes in real GDP and economic well-being, by country (in US$ million)

Country	Real GDP		Economic welfare (in equivalent variation of income)	Country	Real GDP		Economic welfare (in equivalent variation of income)
	Base	%			Base	%	
Indonesia	432,103.19	0.019	64.87	India	1,232,816.38	-0.008	-328.49
Cambodia and Lao People's Democratic Republic	12,644.03	0.194	182.27	Rest of South Asia	266,235.88	-0.002	-32.80
Malaysia	186,642.11	0.145	430.37	Australia and New Zealand	995,227.63	-0.002	-101.61
Philippines	144,070.47	0.052	237.41	Canada	1,424,062.63	0.000	-15.45
Singapore	176,759.66	0.037	2,389.27	United States of America	14,061,782.00	0.000	-601.56
Thailand	247,109.83	0.135	210.79	Brazil	1,365,983.25	-0.001	-47.33
Vietnam	68,435.25	0.022	24.31	Rest of North and South Americas	2,470,987.75	0.001	36.62
Rest of Southeast Asia	28,601.50	0.172	76.41	European Union 27	17,003,710.00	-0.001	-767.54
China	3,494,058.00	-0.002	-421.73	Middle East and North Africa	2,530,414.00	-0.001	183.00
Hong Kong and Chinese Taipei	600,833.13	-0.003	-191.83	Rest of Africa	879,130.94	-0.001	-16.45
Japan	4,377,944.00	-0.004	-827.83	Rest of the World	2,782,553.00	0.002	111.00

Source: Authors' computations
* Shaded entries refer to industries with positive gains in real GDP and equivalent variation of income.

5. Adjustment process

This section identifies several issues in the country's adjustment process to determine the complimentary policies and programs of the Philippine government to fully realize the economic benefits of goods trade integration. It basically asks the question: What effects may the Philippines expect if all the goods trade liberalization reforms under AEC are fully implemented without regard as to when those effects are going to take place?

Does ASEAN integration help the Philippines create jobs? As with every trade liberalization process, local workers, farmers, and business people view the economic integration undertaken through AEC to be a process whereby local products will be substituted out in the local markets by cheaper and ostensibly better quality imported products. This implies loss of domestic jobs, travel to look for jobs overseas, and adjustment costs.

However, local exporters see the economic integration in ASEAN as providing them new markets for their products and creating more and new jobs for the country. With the talk about AEC supporting the formation of regional

value chains, local exporters view this process as bringing them into a more cooperative—rather than competitive—process.

The two effects on employment are likely to happen in the process. Jobs are lost in some industries of the economy and created in others. As conventionally structured, general equilibrium models are full employment models. As such, no net jobs are created or lost by trade liberalization. What can be observed is a change in the allocation of the workforce across the various industries as shown in Table 6. Thus the model is not useful in discovering if trade liberalization creates more than destroys jobs in the economy. Therefore, an examination of other factors is important; the rest of the discussion looks at the literature on this topic.

5.1. Trade liberalization and employment: empirical assessments

The empirical relationship between trade liberalization and employment has been difficult to pin down. In the early 2000s, a series of case studies, done under the auspices of the International Labor Organization, on the impact of trade liberalization on manufacturing employment in selected emerging economies failed to yield a clear picture [Lee 2005]. In the three Asian emerging economies covered by the case studies (i.e. China, India, and Malaysia), the expansion of trade led to increases in employment in manufacturing, employing greater number of low- compared to high-skilled workers. The driver was the increased growth of export-oriented manufacturing industries, which happened to be relatively labor intensive compared to import-competing industries. However, jobs were not altogether lost in the latter despite the competition with imports.

However, these positive impacts of growth on employment failed to transpire in the Latin American countries in the sample, such as Brazil and Mexico. Manufacturing employment has either stagnated or declined. Low-skilled workers tended to lose jobs. The results were attributed "to unfavourable initial conditions (e.g., extremely unequal distribution of assets), problems of macroeconomic management and overdependence on external resources, but more work is required to develop adequate insights" [Lee 2005:8].

5.2. Recent assessments

More recent assessments of the relationship between trade liberalization and employment take off from the trade model that features heterogeneous firms, differentiated products, trade costs to export [Melitz 2003], and labor matching with equilibrium unemployment [Mortensen and Pissarides 1999].

Helpman and Itskhoki [2010] developed such a trade model for two countries. They showed analytically that the country with lower labor market search costs gains proportionately more than the other. Reducing trade barriers between the two countries may raise unemployment, defined as the excess of workers seeking work and the available job vacancies that are filled up.

The state of the country's labor market institutions has the important role in determining whether trade liberalization raises or reduces unemployment. When labor market frictions are high, trade reforms raise the rate of unemployment, but they lower the unemployment rate under a more flexible labor market.

5.3. Market transaction costs

A related gap in analyzing the effects of trade on employment incorporates product market transaction costs. Allen [1991] suggested classifying transaction costs into those related to exchange of assets and those associated with defining and enforcing property rights. The former arise "because parties to exchanges must find one another, communicate and exchange information" and must need "to inspect and measure goods to be transferred, draw up contracts, consult with lawyers or other experts and transfer title" [Stavins 1995:134]. Lack of logistics infrastructure, communications and banking facilities, and other common services constrains the capability of producers to take advantage of known Vmarket opportunities.

The latter are costs related to establishing and maintaining property rights, which are needed in organizing and keeping cooperative business relationships. Property rights transaction costs have the potential of dampening the investments needed to facilitate adjustments to reforms.[7] Exports require investments, which in turn depend upon the investment climate of the country.

The omission of transaction costs in market models may help explain the deviation between the simulated effects of economic policy reforms and the observed secondary data. An ex-post assessment of the effects of unilateral trade reforms in the Philippines yielded results that did not meet the findings from an analysis of the reforms using a computable general equilibrium model without transaction costs[8] [Clarete 2006].

5.4. Baseline unemployment

An interesting scenario is if the trade liberalization occurs when there is starting labor unemployment in the economy. Suppose first that labor or export product market transaction costs are weak. In this scenario, trade liberalization will generate new jobs. Without transaction costs, the export industries can absorb the unemployed by exporting to the rest of the world as much products as its

[7] Allen [2001] regards Coase [1937] as the one who raised the importance of the transaction costs in establishing and enforcing property rights. Interestingly, in about the same period, Hicks [1935] wrote about "the cost of transferring assets from one form to another," referring to the "neoclassical" meaning of transaction costs.

[8] The simulation of the ex-ante effects of trade liberalization was conducted by Habito and Cororaton [2000] using a 50-sector computable general equilibrium of the Philippine economy.

resources permit. In this scenario, regional trade liberalization is a remedy to labor unemployment.

However, it is very likely that the realistic scenario is one that combines baseline unemployment of labor in an economy and significant export product and labor market transaction costs. It is not surprising to expect that jobs may be lost more than created because of short-run lack of capacity of the export industries to take advantage of new market opportunities. Trade liberalization in this case could worsen the baseline unemployment instead of alleviating it. But such is not the only scenario. If transaction costs are weaker compared to the willingness of workers to accept a lower wage just so that they can get employment, then trade liberalization can generate new jobs.

6. Concluding observations and policy recommendations

The economy-wide effects of the goods trade liberalization in ASEAN on the Philippine economy are computed using the GTAP model of the world economy. Goods trade liberalization is a key reform made by ASEAN leaders under the ASEAN Economic Community, comprising the free trade area tariff reforms, prohibition of non-tariff trade barriers, and trade facilitation. Altogether, 24 of the 40 industries representing the Philippine economy reduce production. The economic resources they lost went to the 15 industries that expanded their respective production. Notwithstanding the contraction of production in 24 industries, the country comes out a net gainer in aggregate output. With a base value of aggregate output at ₱11.3 trillion, the country comes out of this tariff liberalization process as gaining by 1.41 percent. Exports and imports both increase in value, but there is a positive trade balance as goods and services outflow outweigh inflows.

Considerable movement of workers across industries is observed. Reductions in skilled worker employment resulted in 31 industries, and 35 industries do the same in the case of unskilled labor. The industries with the largest layoff rates are agriculture-based, namely, milled rice, milled sugar, and vegetable oils. Manufacturing industries come next. Thirteen to fifteen out of 20 manufacturing industries let go of their workers to other industries. While all services industries lay off skilled or low-skilled workers, the layoff rates are all less than a percent. Despite the loss of jobs, the other industries that expanded production absorbed the laid-off workers.

The study looked at also the important topic of how the economy adjusts towards the expected changes as a result of goods trade liberalization in ASEAN. Does ASEAN integration help the Philippines create jobs? As conventionally structured, general equilibrium models, like the one used in this study, are full employment models. As such, no net jobs are created or lost by trade liberalization. One needs to adjust the model to take into account the possible unemployment in the economy, a task yet to be done.

The analysis of labor market adjustment in this paper to freer trade indicates that workers are likely to get unemployed for some time, as the export-oriented activity tends to adjust at a slower rate than imports. The adjustment period can be shortened with appropriate investment in adjustment facilitation programs. These may aim to provide information to the private business sector on new market opportunities, organizing value chains, facilitating coordinated investments along the chain, clustering of related small and medium enterprises to boost external economies, and providing information to employers and workers of job opportunities, including training.

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