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Economic Impact of a Potential Free Trade Agreement (FTA) Between the European Union and Asean

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Economic Analysis in Support of Bilateral and Multilateral Trade Negotiation
Commission of the European Union – Directorate-General for Trade (CIREM, NECTAR)

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ECONOMIC IMPACT OF A POTENTIAL FREE TRADE AGREEMENT (FTA) BETWEEN THE EUROPEAN UNION AND ASEAN

CEPII - CIREM

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Executive summary

This report proposes an assessment of the likely outcome of a free trade agreement between the ASEAN and the European Union. Such an agreement would have multiple effects on sectors, countries and factors, and need to be addressed using a properly designed methodology. Various scenarios have been assessed using a computable general equilibrium (CGE) model: the CEPII's CGE model, nicknamed MIRAGE. In order to have a realistic approach to the negotiation process, the initial protection level has been calculated at the finest available level of detail (the HS6 six digit nomenclature of international trade), using the MAcMap database.

Three scenarios have been modelled and simulated below:

- In a first scenario, tariffs on goods are fully dismantled, while 50% of trade barriers in services are removed. As a sensitivity analysis, this scenario will be compared with a situation where trade in services is not liberalised.
- The second scenario introduces a list of sensitive products excluded from the agreement.
- In a third scenario an alternative preexperiment scenario is considered in order to assess the impact of a changing environment as regards the world economy.

In all scenarios, the tariff dismantling begins in 2008 and is fully implemented in 2015. The impact of trade liberalisation on foreign direct investment is taken into account in the simulations.

Several conclusions can be drawn from this exercise:

- First, as compared with other simulations done by CEPII, the gains accruing to ASEAN members are very large, adding up to more than 2% of GDP in 2020. Accordingly, this potential agreement would have an enormous impact on trade, production and welfare, as compared to other episodes of trade liberalisation.
- Second, the bulk of the gains (actually three quarter of the gains accruing to the ASEAN) are associated with the liberalisation in services. All scenarios including a liberalisation in services are associated with welfare gains shared by all countries taking part in the agreement. This remains true when obstacles to trade in services are kept unchanged, with the exception of Philippines for which a FTA EU-

ASEAN would not be profitable unless liberalisation of trade in goods is accompanied by a substantial liberalisation in services. Given the difficulty to make progress in the WTO arena as regards the liberalisation in services, it is thus worth to engage a negotiation at the “regional” (i.e. ASEAN-EU) level on this issue.

- Third conclusion, the introduction of a list of sensitive products, as a result of political economy constraints, will increase the overall expected welfare gains for the ASEAN and the EU.
- The third scenario confirms the desirability of the agreement when the changing environment is taken into account: considering a different environment in which an EU-ASEAN FTA occurs in conjunction with an EU-Mercosur agreement as well as ASEAN FTAs with Japan and the US leads to even stronger overall gains than those obtained in the first scenario. In this alternate background a EU-ASEAN trade liberalisation would lead to a reduction of tariff discrimination while in the first scenario it was the converse.

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Introduction

In addition to their commitment in the ongoing multilateral trade negotiations, WTO members may contemplate bilateral agreements: this is a way to further liberalise trade, as well as to negotiate on issues not covered by the multilateral agenda. The European Union (25 countries) and the ASEAN (10 countries) have decided to investigate the feasibility of entering into such an agreement.

The aim of this study is to assess a free trade agreement between these two groups of countries and to evaluate the gains or the losses. All sectors are concerned: agriculture, industry and services. Alternative scenarios will be computed and compared in order to provide a quantitative assessment of the opportunities that might be expected from this bilateral negotiation. Non-tariff issues such as investment, IPR protection, competition provisions, public procurement etc. are not factored in due to methodological constraints.

The first scenario is very ambitious: all obstacles to trade in goods are removed while a fifty per cent cut in the obstacles to trade in services is implemented. Alternatively, we consider a situation in which liberalisation is limited to trade in goods.

The second scenario introduces a list of sensitive products excluded from the agreement.

In the third scenario, a different preexperiment scenario is considered, in which FTAs between the EU and Mercosur on the one hand, and ASEAN and other OECD members on the other hand, are incorporated.

The study is organised as follows: in the first section, the tools are presented; a second section presents the baseline and the underlying assumptions; in a third section, the initial trade and protection patterns between the ASEAN and the EU25 are described; in a fourth section, the assumptions of the scenarios are detailed; the simulation results are presented in the final section.

The Computable General Equilibrium model and trade barriers databases

Introduction

In order to evaluate the economic impacts of a bilateral agreement between EU25 and ASEAN, a CGE assessment will be performed. The objective of such a “general” modelling approach is to take into account the intricate relations between markets, prices and incomes. The advantage of using a multi-country model is to take into account the impact of a changing world environment, as well as the possible feedback associated with the bilateral trade liberalisation.

Changes in production and prices have consequences on production factors: e.g. an increase in the agricultural output will translate into additional demand for land and unskilled workers, which in turn will induce a raise of their prices. For the same reasons, any growth in the demand for industrial goods will imply an increase in the return on capital to allow for additional investment.

The model used here is the CEPII’s CGE model, nicknamed MIRAGE. It is a dynamic model fitted with imperfect competition (in order to give a more realistic representation of the world economy) in the manufacture and service sectors, allowing for endogenous FDI flows (see the description of MIRAGE infra). MIRAGE describes imperfect competition in an oligopolistic framework à la Cournot. ..

The model is using the GTAP database. GTAP (Global Trade Analysis Project) is a global network of researchers and policy makers conducting quantitative analysis of international policy issues. GTAP's goal is to improve the quality of quantitative analysis of global economic issues within an economy-wide framework.¹ The GTAP database is a global database describing bilateral trade patterns, production, consumption and intermediate use of commodities and services.² However, instead of relying on modelling tariff cuts at the sector level, we use a detailed database (MAcMap) at the HS6 level (5100 products); this permits better handling of the dispersion of tariffs (which matters as far as the gains to their removal will depend on such dispersion) as well as introducing sensitive products. This also allows analysis to be based on real, applied tariffs, including preferential provisions (e.g. GSP, FTAs...). Additional data for FDI has been collected, and the protection in services has been evaluated and modelled in a specific way. Basically, we consider here that regulations affects trade in services, which needs to be modelled differently from the imposition of a tariff: no revenue for the government is associated with such regulations, while firms managing to bypass such regulations will obtain a rent. Alleviating the regulation cuts the rent of the exporter, reduces the price to the consumer and expands trade.

MAcMap: border protection.

A detailed description of the MacMap database is provided in Appendix 2: Presentation of MAcMap database.

¹ <https://www.gtap.agecon.purdue.edu/about/project.asp>, 03-22-2006

² <https://www.gtap.agecon.purdue.edu/databases/default.asp>, 03-22-2006

This database is used to construct the scenarios of trade liberalisation at the product level (HS6 level) before aggregating the data towards the sectors used in the CGE model. The advantage of such a strategy is to fully take into account tariff peaks, exceptions and the possible non linearity of the applied tariff reduction formula, such as the Swiss formula (the latter formula does not concern the bilateral agreement under scrutiny, but the pre-experiment scenario that takes into account an expected outcome of the negotiations in the multilateral arena). In addition, information on the evolution of quota rents is extracted from the scenario and used in the modelling.

Mirage: a CGE model

In order to evaluate the benefits of a bilateral liberalisation process, CGE (computable general equilibrium) models are powerful tools. The CEPII has developed its own CGE model. This Section proposes a brief overview of the CGE model used, namely the MIRAGE model. The main characteristics of the model concern the assumptions made about product quality ranges, imperfect competition, and macro-economic closure.

The demand side is modelled in each region through a representative agent.³ Domestic products are assumed to benefit from a specific status for consumers, making them less substitutable to foreign products than foreign products between each other. Secondly, products originating in developing countries and in developed countries are assumed to belong to different quality ranges. This is motivated by the fact that several empirical works have shown that unit value differences are able to reveal quality differences even at the most detailed level of products classification. This is likely to have direct consequences on the transmission of liberalisation shocks since the elasticity of substitution is lower across different qualities than across products within a given quality. Hence, the competition between products of different qualities is less substantial than between products of similar quality. In the absence of systematic information suitable for the incorporation of vertical differentiation in a worldwide modelling exercise such as the one undertaken here, differentiation is modelled in an *ad hoc* fashion: developed countries and developing countries are assumed to produce goods belonging to two different quality ranges; substitutability is assumed to be weaker across these two quality ranges, than between products belonging to the same quality range.⁴

As regards the supply side of the model, producers use five factors: capital, labour (skilled and unskilled), land and natural resources. The structure of value added is intended to take into account the well-documented skill-capital relative complementarity. These two factors are thus bundled separately, with a lower elasticity of substitution, while a higher substitutability is assumed between this bundle and other factors.

³ The utility function is intra-temporal, with a fixed share of the regional income allocated to savings, the rest used to purchase final consumption. Below this first-tier Cobb-Douglas function, consumption trade-off across sectors is represented through a LES-CES function. Each sectoral sub-utility function is a nesting of CES functions, comparable to the standard nested Armington – Dixit-Stiglitz function, with two exceptions.

⁴ Practically, this is modelled by introducing in the demand nesting a level corresponding to the trade-off between the two quality ranges. This level is the first one in the consumer choice within each sector, before any other choice in terms of geographical origin.

The production function assumes perfect complementarity between value added and intermediate consumption. The sectoral composition of the intermediate consumption aggregate stems from a CES function. For each sector of origin, the nesting is the same as for final consumption, meaning that the sector bundle has the same structure for final and intermediate consumption.

Constant returns to scale and perfect competition are assumed to prevail in agricultural sectors. In contrast, firms are assumed to face increasing returns to scale (through a constant marginal cost and a fixed cost, expressed in output units) in industry and services. In those sectors, competition is imperfect.⁵ This modelling allows the pro-competitive effect of trade liberalisation to be captured.

Capital goods have the same composition regardless of the sector; they cannot change their sector affectation once it has been installed, which introduces a rigidity in the economy suggested by empirical evidence. Capital is accumulated every year as the results of investments in the most profitable sectors. Natural resources are considered to be perfectly immobile and may not be accumulated. Both types of labour are assumed to be perfectly mobile across sectors, whereas imperfect land mobility is modelled with a constant elasticity of transformation function. Production factors are assumed to be fully employed; accordingly, negative shocks are absorbed by changes in prices (factor rewards) rather than in quantities. All production factors are immobile internationally. With respect to macroeconomic closure, the current balance is assumed to be exogenous (and equal to its initial value in real terms), while real exchange rates are endogenous.

Since protection in services takes the form of regulatory measures leading to no tariff revenue to the importing country, the most appropriate way to introduce them was to translate these estimates into export taxes, as has been done for import quotas when they exist (multi-fibre agreement for instance). Liberalising services is therefore expected to lead to large gains for the liberalising countries, whereas gains for the exporting countries are second order ones.

⁵ Firms compete à la Cournot, with zero conjectural variations, no Ford effect, and no strategic interaction. Each firm enjoys some market power, and sets its mark-up depending on the extent of product differentiation in the sector, but also of its own market share.

Main features of the study

Baseline

The world is changing and so do the variables of the model. The population is growing and the regions' GDP too. These changes have consequences on the world economy. In order to compute more precisely the effects of a bilateral FTA, a baseline has been constructed for this study. Basically, we use population and GDP projections, and compute the trajectory of the technological progress that is consistent with the assumptions of Mirage.

The *baseline* has to be distinguished from the *pre-experiment scenario*. To compute the sectoral technological progress fitting with population and GDP projections, no assumption is made as regards future evolutions of market access. All tariffs are kept unchanged after 2005 in the baseline.

In contrast, pre-experiment scenarios are based on assumptions regarding the future of trade policy, either based on expected outcomes of ongoing negotiations or on already signed relevant agreements.

As a consequence, GDP evolution may slightly differ between the baseline and the pre-experiment scenarios.

Demographics

The initial levels of skilled and unskilled labour force in each region of the model are those of the GTAP 6.1 database. The structure of the labour force (ratio of skilled to unskilled) is assumed to be constant over time.

The growth rate of the labour force in each region is taken from the World Bank projections of population.

Gross domestic product (GDP)

The annual growth of GDP in each region is taken from the World Bank projections.

Total factors productivity (TFP)

We consider three sectors: agriculture, industry and services.

The computation of annual growth of the different TFP is first computed endogenously. The figures are then taken as exogenous variables and put into the model.

This methodology is based on the following assumption: productivity gains in agriculture and the industrial sectors are assumed to be 2 points higher than the change in productivity in the services sectors.

Trade policy in the pre-experiment scenarios

The first trade policy assumption made in both pre-experiment scenarios is the expected outcome of the Doha round, presented in Table 1:

Table 1 Assumptions regarding the outcome of the Doha round

	Agriculture	Non agricultural products	Transition period
Industrialised countries	Tariffs: -40% Dismantling of export subsidies Domestic Support: -50%	Tariffs: reduced by a Swiss formula with a coefficient of 10	5 years
Developing countries	Tariffs: -35%	Tariffs: reduced by a Swiss formula with a coefficient of 15	8 years
Least Developed Countries	No commitment	No commitment	

In addition to the completion of the DDA, two bilateral agreements are integrated in both pre-experiment scenarios: The intra-ASEAN FTA (AFTA) and the ASEAN–China FTA (CAFTA).

The reduction of tariffs as a result of the AFTA started in 2002. Full removal of tariffs will be completed by 2010 for ASEAN-6 and by 2015 for Cambodia, Laos, Myanmar and Vietnam.

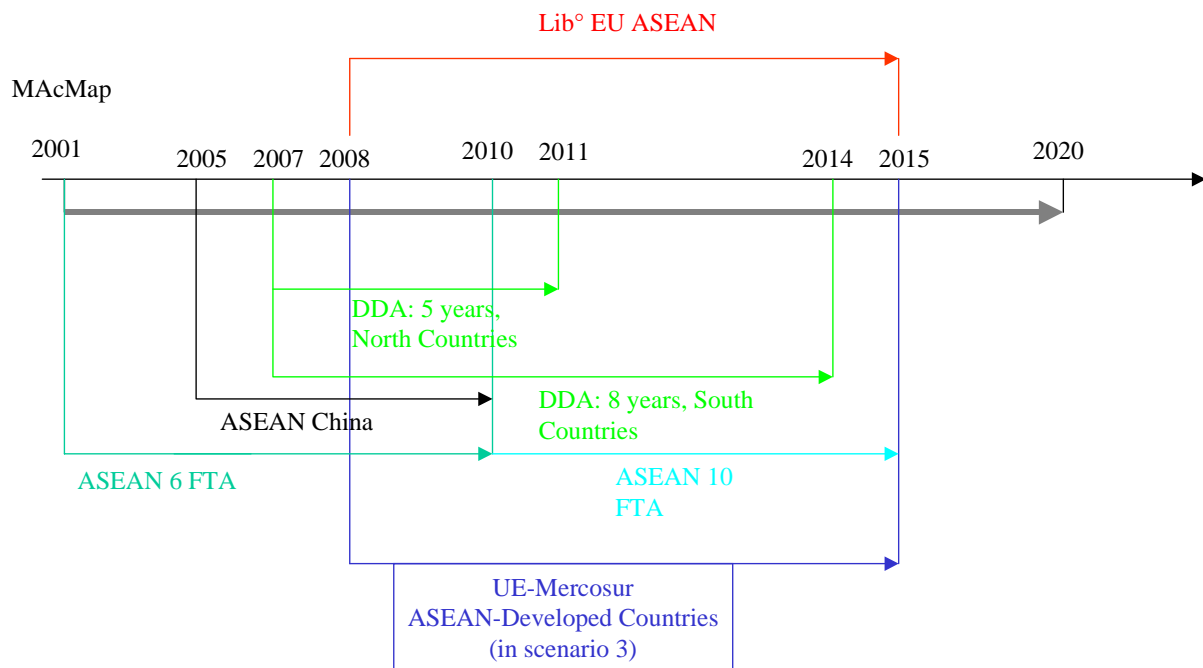
The implementation of the CAFTA, with the exception of some sensitive products, has started in 2005⁶ and will be completed by 2010.

Scenario 3 differs from *scenarios 1 and 2* on the pre-experiment scenario: two other FTAs are added to the dynamic background:

- an ASEAN – Rest of developed countries (to be specified) FTA, assumed to start in 2008 and to be completed in 2015 (the same time-span as the EU25-ASEAN FTA to be presented below)
- an EU25 - Mercosur FTA, presumed to occur at the same time.

⁶ The actual starting date is 2004 for some agricultural products while it is mid-2005 for industrial goods. However, since it is only an element of the background it was more convenient to keep it simple.

Figure 1: Pre-experiment scenarios



Foreign Direct Investment (FDI) data

Special attention has been paid to Foreign Direct Investment (FDI) in this study. Indeed, overlooking this important dimension would be an important drawback of any simulation of the impacts of such an FTA. A CGE like MIRAGE needs to be fed by a bilateral and sectoral database concerning foreign investments and assets. This exhaustive information is required for model calibration and takes into account the specificities of the actual FDI's patterns.

However, such a database splitting FDI across three dimensions: origin country, destination country and sector, does not currently exist on a world-wide basis.

In order to provide the model with this information, we have built a specific database, using OECD data (country-country and country-sector datasets) and UNCTAD data (global FDI by country).

The methodology followed for building this country-country-sector database is the following:

1. To limit the consequences of volatility of FDI flows, a five-year average (1999-2004) is computed. For FDI positions, we take the value of year 2001 (GTAP6's reference year).
2. FDI levels for a given country, summed up across all sectors and all partners, are made consistent between the different databases by a rescaling operation.
3. Mirror flows (and positions) between countries, described in the OECD dataset, are made consistent (average).
4. Given the fact that the data will be used in a CGE, negative values are put to zero.

5. Using available information about country-country relations (in/out-flows and in/out-ward positions) and country-sector (in/out-flows and in/out-ward positions), a FDI pattern is built in the three dimensional space: country-country-sector.
6. In order to split the sectoral or regional aggregates existing in the raw data to match this study's nomenclature, for every bilateral relation, an allocation key based upon production and trade patterns⁷ between the two countries has been used. This reflects the well known positive correlation between FDI and trade structure.
7. Following this distribution stage, a cross-entropy minimisation procedure is applied to enforce the consistence of this matrix (checking the total by country, the total of country-sector inflows, and inward positions defined during step 4).
8. No flow should excess the associated stock position. So, we cap every flow at 90% of the existing stock.

Protection in services⁸

Trade in services face considerable restrictions, but the assessment of their consequences is not an easy task. They are mostly based on national regulations with a significant trade impact. To introduce them in a quantitative model it was necessary to translate them into tariff equivalents.

Tariff equivalents used in this study are based on two different works, one by Park (2002)⁹, and the other by the Australian Productivity Commission (2005)¹⁰. They follow two distinct approaches, leading to two quite different sets of tariff equivalent values.

The first approach, followed by Park (2002), is based on a gravity methodology. Gravity models are based on an analogy with Newton's gravitational law. They are often used to account for aggregate human behaviors related to spatial interaction such as migration and traffic flows. Concerning world trade, the gravity model is based on the idea that the volume of trade could be estimated as an increasing function of national incomes of trading partners, whereas it would decrease when the distance between them increases. Additional variables can be introduced to control for common border, common culture, common currency, etc.

⁷ GTAP6 data are used for trade and production levels.

⁸ We acknowledge efficient research assistance by Christina Mitaritonna (CEPII) regarding the compilation of barriers in services.

⁹ Park (2002) "Measuring tariff equivalents in cross border trade in services", KIEP Working paper 02-15.

¹⁰ Hoekman, B. "Assessing the General Agreement on Trade in Services," in Will Martin and L. Alan Winters, The Uruguay Round and the Developing Countries, World Bank Discussion Paper No. 307. Washington, The World Bank, 1995.

Park fits a gravity model to bilateral trade in services between 51 countries, considering 7 service sectors – Construction, Distribution (of energy, water and gas), Transport, Communication, Financial, Business and Other services (Education, Wealth and Administration). The differences between actual and predicted imports are taken to be indicative of trade barriers and then normalised relative to the free-trade benchmarks. The countries with the largest positive differences between actual and predicted imports are considered to be the free trade “benchmarks” in the regression. In this case, the actual value which represents the imports of a country is larger than the predicted value which corresponds to the imports of a country calculated by the gravity equation. The larger this value, the larger the imports of a given country and thus the more likely this country will be a free trader in the services sector. As regards the elasticity of substitution, Hummels (1999) has shown that the elasticities of substitution are sensitive to the disaggregation of industries. He estimates the average elasticities to be 4.8, 5.6 and 6.9 for 1-digit, 2-digit and 3-digit industries, respectively. As Park did, we choose 5.6 for all services sectors.

The second approach, followed by the Australian Productivity Commission (2005) using OECD estimates, is based on the estimates of restrictiveness, using the GATS commitment schedules of member countries. First, qualitative information about regulations is converted into a quantitative 'restrictiveness index'. Second, the effect of this measure of restrictions on prices and/or costs is estimated in an econometric model of economic performance in a given sector. Depending on the performance measure chosen, the results provide an indication of the extent to which restrictions affect price-cost margins, and therefore create economic rents, or raise costs above what they otherwise would be in the absence of restrictions. Free trade would yield a restrictiveness index score of zero. We obtain an estimate of the effects of current restrictions on economic performance, relative to a free-trade benchmark (and holding other factors constant). Mathematical manipulation can convert this into a percentage “tax equivalent” (the appropriate manipulation depending on the particular measure of performance and the particular functional form for the estimated equation). They are translated into protection equivalents.

To build our protection database, we use the two sets defined above: the Park's one and the Australian productivity commission's one. For most sectors we only rely on Park's estimates because the Australian productivity commission sectors do not match the GTAP decomposition very well. When both data are available we use the simple mean of both estimates.

At the geographical level, when no data for a specific country is available, a weighted average of the estimates for the other countries belonging to the same area or all the countries available is used (e.g. as in the case of the Russian Federation).

When a missing country belongs to a geographical area for which there is original data available we use only original data to compute the average.

In order to obtain tariff equivalents fitting the aggregation of our model, we aggregate obtained estimates by sector and by country/geographical area, using the value of total demand for this service at market price as a weighting scheme. Data on the demand of services are those that are used in the model (GTAP 6.1).

Sector and country aggregation

In order to run the simulations, an aggregation of the GTAP sectors and countries according to the kind of issue one is interested in is needed.

In doing so, one must carry out a trade-off between detailed information and computation as well as interpretation constraints. The different simulations are based on an aggregation in 12 regions and 33 sectors.

Table 2 reproduces the aggregation of countries into regions. Then, we describe the aggregation of the different sectors. The geographical and sectoral aggregations are the same for all scenarios.

Country aggregation

To match the objectives of the study, we needed the most detailed level for the ASEAN countries: The GTAP database allows us to have six ASEAN countries represented on an individual basis. The rest are aggregated into one region: Rest of South Asia (RoSA). EU25 is treated as a single region.

The other regions of this study were chosen accordingly to their importance as trade partners or as competitors: China is isolated as a single country, so is India. Developed countries are aggregated into one region (which contains the USA, Canada, Hong Kong, Korea, Taiwan, Japan, Australia, New Zealand, Switzerland, Rest of EFTA, Bulgaria, Croatia, Romania, and Russian Federation).

Table 2 Country aggregation

	Mirage Geographical Aggregation	Countries
01	Indonesia	
02	Malaysia	
03	Philippines	
04	Singapore	
05	Thailand	
06	Viet Nam	
07	Rest of South ASEAN	
08	EU25	
09	China	
10	India	
11	Other developed countries	Australia
		New Zealand
		Hong Kong
		Japan
		Korea
		Taiwan
		Canada
		United States of America
		Bulgaria
		Croatia
		Switzerland
		Rest of EFTA
		Romania
		Russian Federation
12	Other developing countries	Venezuela
		Argentina
		Brazil
		Uruguay
		Other developing countries

Sector aggregation.

The 57 GTAP sectors are aggregated into 33 sectors. For the sake of presentation they are divided into four sets: non agricultural primary sectors, agriculture and food, industry and services.

As we could not split the GTAP sectors, some priority sectors will not appear as one sector but they will be part of a larger sector.

Non agricultural primary Sectors

This set contains 2 sectors:

- 1- Fishing
- 2- Primary products (Minerals, Metals, Petroleum, Coal, Oil and Gas)

Agriculture and food

This set contains 8 sectors:

- 3- Rice: paddy rice and processed rice
- 4- Sugar: raw sugar (sugar cane, sugar beet) and refined sugar
- 5- Poultry, rabbits and pork meat corresponds to one GTAP sector (Meat products nec) that do not include living animals. It also contains some other animal products like salted meat. We separated it from other GTAP meat and animals sectors because of its significant share in EU25-ASEAN trade.
- 6- Animals and other meat is the aggregation of all other agricultural activities involving animals: all living animals, meat not mentioned in the previous sector, raw milk, wool and silk-worm cocoons
- 7- Other agricultural products include all other vegetal production
- 8- Vegetable oils and fats
- 9- Beverages, tobacco and dairy is the aggregation of two GTAP agro-food sectors that do not represent a significant share of EU25-ASEAN trade
- 10- "Food products" contains all processed food not mentioned earlier. It is one GTAP sector isolated on the basis of its importance in EU25-ASEAN trade.

Industry

This set comprises 12 sectors.

Clothing Industry

- 11- Apparel
- 12- Textiles
- 13- Leather, contains footwear as well as other leather products

Other Industries

- 14- Wood products
- 15- Cars and trucks contain cars, trucks and their parts

- 16- Other transport equipment contains all other vehicles: airplanes, ships, trains, bicycles, motorbikes, and their parts
- 17- Metal and mineral products is the aggregation of two GTAP sectors
- 18- Paper and publishing is one single GTAP sector Paper products and publishing
- 19- Chemical, rubber and plastic products contains rubber products (an ASEAN priority sector) along with other product from which they cannot be separated
- 20- Electronic equipment is one single GTAP sector
- 21- Machinery and Equipment is the third sector in terms of EU25-ASEAN trade
- 22- Other manufactures contains all other manufactured products

Services Sector

Services are particularly important in EU25-ASEAN trade. They are therefore split into 10 different sectors:

- 23- Dwellings: this service is not tradable
- 24- Transport is the aggregation of the three GTAP sectors: Sea transport and Transport nec (not elsewhere classified)
- 25- Air Transport corresponds to the sector Air transport of the GTAP database. It is assimilated to the Air travel priority sector of ASEAN
- 26- Recreation and other services contains the tourism sector
- 27- Financial services correspond to the sum of insurance and financial services
- 28- Business services is a single GTAP sector, the second largest service sector in EU25-ASEAN trade
- 29- Energy and water supply is the aggregation of three GTAP sectors: Electricity, Water, Gas manufacture & Distribution
- 30- “Public interest services” is the aggregation GTAP sector: Public Administration, Defence, Health and Education. Governments are generally largely involved in these services, though they can be partly run by private companies.
- 31- Communication
- 32- Construction
- 33- Trade

ASEAN priority sectors

The 11 priority sectors are electronics, e-ASEAN, healthcare, wood-based products, automotive, rubber-based products, textiles and apparel, agro-based products, fishery products, air travel and tourism.

These selected sectors accounted for more than 50% of intra-ASEAN trade in 2003. In value terms, the priority sectors contributed USD 48.4 billion and USD 43.4 billion of intra-ASEAN exports and imports, respectively, in 2003¹¹.

They have been taken into account in our proposed aggregation so as to have them detailed as much as possible.

¹¹ <http://www.aseansec.org/16620.htm>, 12/12/2005

The electronics and e-ASEAN sectors become one sector Electronic equipment that cannot be split. It is the first sector in EU25-ASEAN trade.

The healthcare sector is a part of our “Public interest services” sector.

Wood-based products correspond to “Wood products”.

The “automotive sector” is very close to our Cars and trucks sector (though a small part of this sector belongs to our “Other transport equipment sector”).

The rubber-based products sector is included in our “Chemical, rubber and plastic products sector”.

The textiles and apparel sector is divided into two sectors: Textiles and Apparel.

“Agro-based products” are included in the Food product sector.

“Fishery products” are assimilated into fishing.

“Air travel” is assimilated into Air transport.

“Tourism” is a part of the Recreation and other services sector.

Thus, while only a few priority sectors can be found in the GTAP database, our aggregation provides a good illustration of how the activity of these sectors may potentially be affected.

Overview of EU25 and ASEAN

The ASEAN:

The Association of South East Asian Nations (ASEAN) was established in 1967 by five founding members: Indonesia, Malaysia, the Philippines, Singapore and Thailand. In 1992, ASEAN agreed to create the ASEAN Free Trade Area, starting in 2002.

The ASEAN comprises currently 10 members: the five above and Brunei Darussalam, Viet Nam, Cambodia, Myanmar and Laos.

The ASEAN region has a population of about 500 million, a combined gross domestic product of USD 737 billion, and a total trade of USD 720 billion.¹²

The European Union:

The European Union or the EU is an intergovernmental and supranational union of 25 countries. The European Union was established under that name in 1992 by the Treaty on European Union (the Maastricht Treaty).

The European Union has 25 member states, approximately 460 million EU citizens as of December 2004. GDP is about USD 12,000 billion.

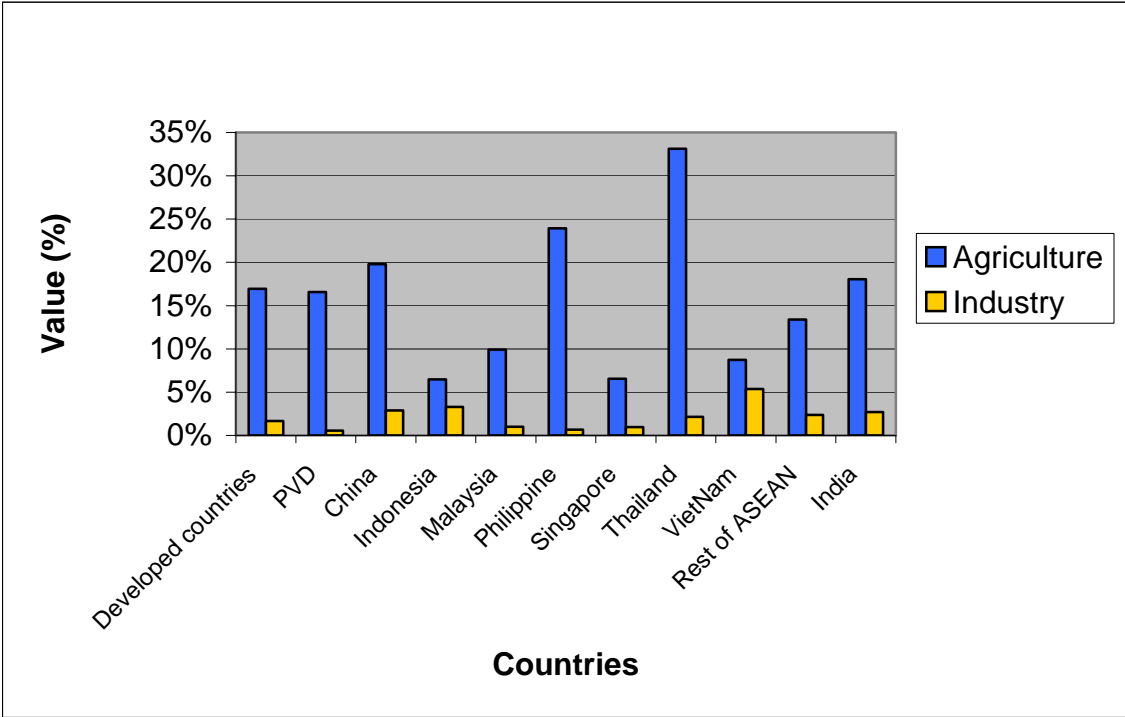
The information on tariff barriers combines two sets of data. First, the tariff on which one negotiates: the bound (consolidated) tariffs. Second the actually applied (preferential) tariff taking into account preferences conceded bilaterally or unilaterally to trade partners. The information is accordingly bilateral (exporter × market) and collected for each of the 5,000 products of the nomenclature. When specific tariffs (expressed for instance in dollars per ton) is used by the importer, one uses a unit value (value over quantity) to convert these tariffs in Ad Valorem Equivalent (AVEs). Last but not least, tariffs on individual products are aggregated into sectors based on the imports of a reference group. We thus avoid to use the imports of the country imposing the tariff, these imports being negatively affected by the level of the tariffs.

The tariff barriers.

The following tables show the initial barriers to trade in goods applied by the European Union to its partners and by the ASEAN to its partners. Information comes from the MAcMap database which provides a disaggregated, exhaustive and bilateral measurement of applied tariff duties, taking regional agreements and trade preferences exhaustively into account, as referred to above.

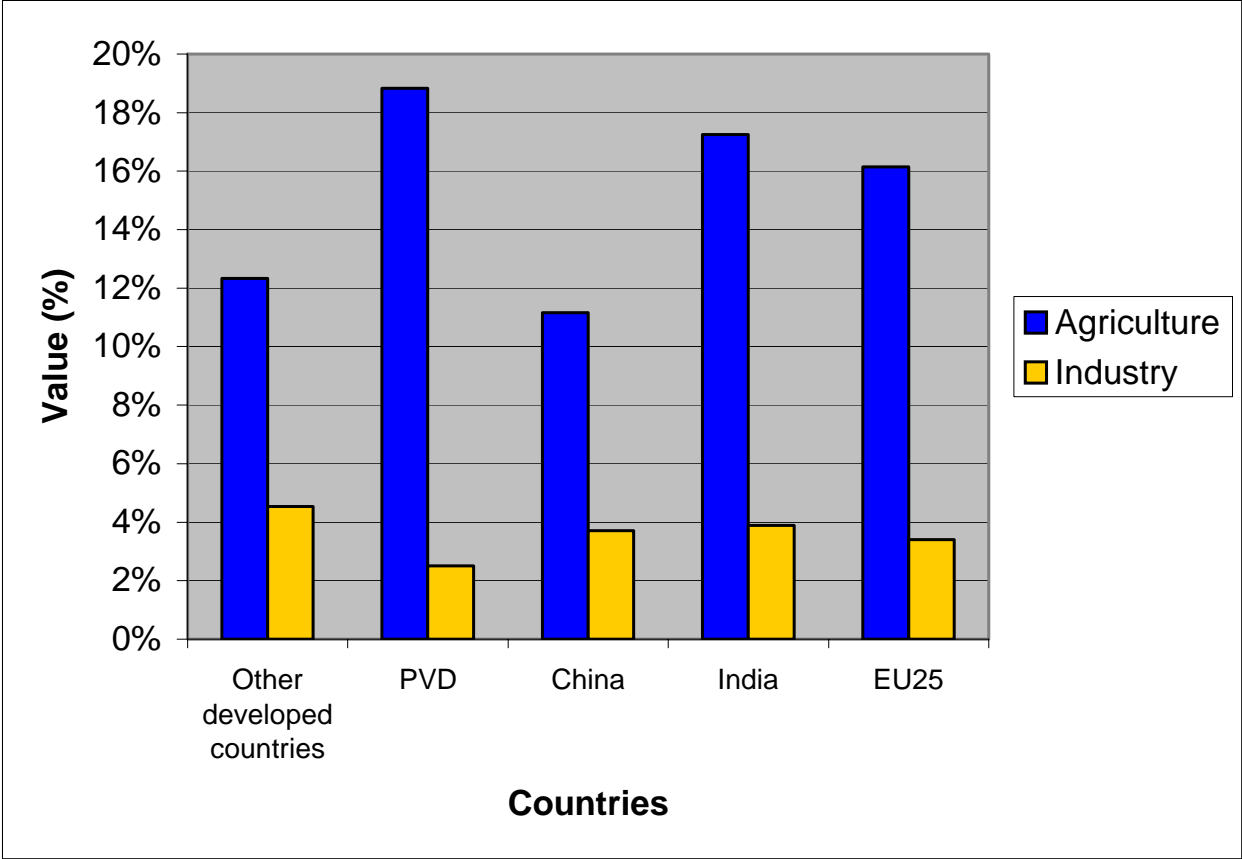
¹² <http://www.aseansec.org/64.htm>, 01/06/2006

Figure 2 Initial barriers to trade in goods – European Union.



The initial barriers to trade in goods of the European Union are higher for agricultural goods than for industrial goods. The protection faced by the different ASEAN countries is quite heterogeneous. Thailand faces the highest level of protection in agricultural sectors (more than 30%); the Philippines have also high barriers when entering the European market in agricultural goods (more than 20%). The EU applies the lowest tariffs for Singapore, since trade with Singapore does not involve agricultural goods. For the other ASEAN countries, the European applied tariffs are lower than 15%.

Figure 3: Initial barriers to trade in goods – ASEAN 10



The aggregated average tariff of the ASEAN10 applied to the EU25 is equal to 16.2% for agricultural products and 3.4% for non-agricultural products (Industry). Thus it is slightly higher than the average protection vis-à-vis the world in agriculture (15.1%) and slightly lower in industrial sectors (3.6%).

Scenarios

In *Scenario 1*, we contemplate a full liberalisation of goods (agricultural and non-agricultural products) and we halve the protection in services. There are no sensitive products and hence no exclusion.

In order to assess the importance of services in the results, we proceed with the same simulation without removing protection in services.

Scenario 2 differs from *Scenario 1* by the integration of a list of sensitive products. In this scenario, we assume that all ASEAN countries share the same list of sensitive products with the EU25. The list of exclusions of the China-ASEAN agreement is used as a reference for ASEAN countries. For the EU25, we used the list of sensitive products of the EU25-Chile negotiation. However, the two lists of sensitive products may be very different in reality and the results might change as the list of sensitive products changes: it is unlikely that ASEAN would define the same products as “sensitive” vis-à-vis the EU as the ones it defined vis-à-vis China.

In *Scenario 3*, we compute the same trade policy reform as in *Scenario 1*. The difference with *Scenario 1* concerns the pre-experiment scenario: two other full FTAs are assumed to take place at the same time as the ASEAN-EU25 FTA: the first one between ASEAN and all other industrialised countries except the EU25, the second one between the EU25 and Mercosur. These hypothetical FTAs are of prime relevance since other developed countries are direct competitors of the EU25 on ASEAN markets, and Mercosur competes with ASEAN on the EU market, particularly for agriculture.

Results and Comparison

Introduction

We now present the results of the different simulations. It is worth stressing that these results compare macroeconomic variables with and without an FTA, the second situation corresponding to what we call the pre-experiment scenario. Two different pre-experiment scenarios are contemplated, the first one including the already signed ASEAN agreements and the outcome of the DDA only (scenario 1 and 2); the second pre-experiment scenario includes the previous elements and adds two more FTAs (ASEAN with other developed countries, and EU-Mercosur).

Scenario 1 should be viewed as the most ambitious one.

Scenario 2 will be compared with scenario 1: they are applied to the same pre-experiment, the only difference being the introduction of sensitive products into the second scenario.

Scenario 3 is to be compared with scenario 1: the shock will be the same between EU25 and ASEAN, but the pre-experiment scenario will be different.

Scenario 1: FTA between EU25 and ASEAN

The simulated welfare¹³ changes associated with scenarios 1 and 4 (scenario 4 is an additional scenario excluding the liberalisation of services) are reported below:

Table 3: Welfare (Variation in %), by country, 2020.

Region	Scenario 1	Scenario 4
	Goods & Services	Goods Only
ASEAN	2.16	0.53
Indonesia	1.81	0.71
Malaysia	8.30	1.99
Philippine	1.12	-0.54
Rest of ASEAN	0.29	0.21
Singapore	0.41	0.00
Thailand	2.63	0.99
Vietnam	2.22	0.41
EU25	0.10	0.03
China	-0.00	-0.00
India	-0.04	-0.06
Other developed countries	0.00	0.00
Other developing countries	-0.04	-0.03

¹³ Welfare change is the equivalent variation of utility. In other words it measures the increase of income that would have been necessary, prices remaining unchanged, to obtain the new level of utility. It can be considered as a measure of the evolution of real income, and does not incorporate any consideration of income distribution within countries.

All ASEAN countries as well as the EU25 are expected to gain from the FTA. Since the EU is a more significant partner for ASEAN than the reverse, the magnitude of the gain is significantly larger for the latter. This is particularly the case for Malaysia.

It is also noticeable that services liberalisation matters a lot in this result. It accounts for 76% of the gains and is required for Philippines to gain from the FTA.

Conclusions regarding welfare are clear-cut:

- Since bilateral protection between ASEAN countries and the EU are rather balanced, there is no significant terms of trade effect.
- Allocation efficiency gains (gains associated to an allocation of resources in the sectors where there are relatively more productive) dominate: all countries benefit from the agreement. Malaysia benefits more as a result of its high initial level of protection in services.

In the following table (Table 4), the main sectors (agriculture, industry and services) are separated. Scenario 1 concerns a FTA with full liberalisation in goods, while protection in services is reduced by 50%. Scenario 4 only concerns full liberalisation in goods. Thus the protection of the services sector is kept.

To interpret the results, one has to keep in mind that we are considering the difference between two situations, with and without liberalisation, after all adjustments have taken place in 2019. Accordingly, 10% additional exports mean that, every year, exports would be one tenth higher, would a liberalisation have taken place. This gain would be reaped in 2019 when adjustments have taken place, but also in 2020 and the subsequent years.

Table 4: Impacts for EU25 and by ASEAN country on production (variation in %), 2020.

Agricultural Sector	Scenario	EU25	Indonesia	Malaysia	Philippine	Rest of ASEAN	Singapore	Thailand	Vietnam
01-Fishing	Scenario 1	-0.04	0.96	5.29	0.78	0.43	0.45	3.03	-1.53
	Scenario 4	-0.05	0.19	0.64	-0.41	0.32	-0.11	2.06	-1.88
02-Primary products	Scenario 1	0.50	-2.06	-1.18	-0.25	-0.78	-1.63	1.30	-2.67
	Scenario 4	0.47	-2.46	-1.35	-3.45	-0.62	-2.21	-0.09	-3.94
03-Rice	Scenario 1	-50.19	1.88	12.43	2.94	6.67	6.87	13.45	1.52
	Scenario 4	-50.65	1.20	9.45	2.21	6.29	5.37	12.91	0.89
04-Sugar	Scenario 1	-1.32	0.70	15.56	4.78	23.83	2.78	2.66	0.84
	Scenario 4	-1.37	0.09	13.01	3.81	24.06	-0.03	2.06	0.83
05-Poultry, rabbits and pork meat	Scenario 1	0.01	-0.48	-2.86	-3.36	-0.29	1.20	8.16	-24.83
	Scenario 4	-0.14	-0.93	-0.51	-3.72	-0.36	3.96	8.09	-22.56
06-Animals and other meat	Scenario 1	0.04	0.26	3.53	-1.08	0.35	5.72	1.58	-0.11
	Scenario 4	-0.08	-0.11	1.34	-1.95	0.13	10.05	1.04	-0.56
07-Other agricultural products	Scenario 1	0.10	0.00	-2.08	0.03	-1.06	-0.61	-4.09	-2.42
	Scenario 4	0.10	-0.19	-0.70	0.98	-0.92	-1.64	-3.43	-1.60
08-Vegetable oils and fats	Scenario 1	-0.30	-0.06	-2.79	1.94	0.81	-0.84	2.35	-5.02
	Scenario 4	-0.38	-0.69	-1.05	1.88	0.76	-1.06	1.03	-5.51
09-Beverages tobacco and dairy	Scenario 1	0.16	0.91	7.56	0.99	-0.05	-1.08	1.55	0.71
	Scenario 4	0.16	-0.33	4.05	-0.53	0.22	-3.74	-0.01	-0.17
10-Food products	Scenario 1	0.10	0.69	0.49	0.44	0.19	1.56	6.23	-7.81
	Scenario 4	0.06	-0.18	1.72	-0.73	0.18	-0.61	5.86	-7.28

Industry Sector	Scenario	EU25	Indonesia	Malaysia	Philippine	Rest of ASEAN	Singapore	Thailand	VietNam
11-Apparel	Scenario 1	-4,12	13,12	-7,68	17,11	-1,51	0,07	4,15	33,25
	Scenario 4	-5,03	11,41	14,26	20,08	-1,14	0,27	3,13	30,36
12-Textiles	Scenario 1	-2,51	9,71	-11,11	17,50	-0,38	-1,28	4,42	24,07
	Scenario 4	-3,60	7,58	10,30	19,38	-1,03	9,25	3,80	22,28
13-Leather	Scenario 1	-7,19	-8,29	16,70	-6,78	-3,06	22,33	1,90	17,78
	Scenario 4	-12,75	-10,88	39,67	-7,18	-5,63	45,70	-4,21	12,54
14-Wood products	Scenario 1	0,24	-2,72	-9,36	-0,08	0,37	-5,23	1,12	-1,70
	Scenario 4	0,21	-3,40	-5,87	-2,62	0,11	-4,68	-0,22	-3,43
15-Cars and trucks	Scenario 1	0,46	-2,22	-7,86	-5,61	0,18	-5,88	5,06	-11,70
	Scenario 4	0,43	-2,91	-8,14	-13,51	0,07	-7,45	3,42	-12,84
16-Other transport equipment	Scenario 1	0,20	-4,86	-21,14	4,44	-0,85	-1,95	2,37	27,34
	Scenario 4	0,21	-5,78	-11,23	0,15	-0,16	-3,41	0,54	24,17
17-Metal and mineral products	Scenario 1	0,27	-2,77	-9,35	0,44	0,21	-2,21	2,73	-0,62
	Scenario 4	0,29	-3,83	-6,11	-4,03	0,26	-3,42	0,49	-1,78

18-Paper and publishing	Scenario 1	0.06	-6.47	-4.25	1.05	0.11	-1.43	1.84	1.16
	Scenario 4	0.08	-7.61	1.36	-0.79	0.11	-2.43	0.68	0.51
19-Chemical rubber and plastic products	Scenario 1	0.19	0.30	-8.87	3.47	-0.09	-1.48	3.66	-3.81
	Scenario 4	-0.00	-1.68	1.22	1.04	-0.19	-0.30	1.20	-6.11
20-Electronic equipment	Scenario 1	0.31	-4.05	-21.68	0.19	0.37	-4.01	6.25	-0.71
	Scenario 4	0.55	-6.77	-13.97	-5.19	0.64	-6.92	1.32	-3.79
21-Machinery and Equipment	Scenario 1	0.53	-7.64	-17.98	0.63	-0.76	-5.69	3.90	-12.68
	Scenario 4	0.64	-8.83	-10.57	-5.69	-0.08	-7.38	1.44	-14.35
22-Other manufactures	Scenario 1	0.45	-2.44	-1.40	1.13	-0.80	-4.38	1.49	-9.98
	Scenario 4	0.38	-3.86	6.40	-0.93	-0.80	-6.00	0.19	-11.13
23-Dwellings	Scenario 1	0.01	1.74	8.50	1.27	0.30	0.42	2.91	1.33
	Scenario 4	-0.02	0.65	1.85	-0.63	0.22	0.05	1.16	0.05

Services Sector	Scenario	EU25	Indonesia	Malaysia	Philippine	Rest of ASEAN	Singapore	Thailand	Vietnam
24-Transport	Scenario 1	0.40	-0.25	-1.43	0.06	0.87	2.13	2.86	2.74
	Scenario 4	0.06	-0.38	-1.36	-0.39	0.12	-1.41	0.61	1.37
25-Recreation and other services	Scenario 1	0.05	1.03	4.07	0.36	0.26	-1.32	1.81	-10.72
	Scenario 4	0.00	0.35	0.09	-0.45	0.09	-1.07	0.59	-3.76
26-Financial services	Scenario 1	0.06	0.80	-2.80	-0.18	0.20	-0.61	1.32	-0.74
	Scenario 4	-0.04	0.40	0.66	-0.91	0.18	-1.31	0.79	-5.30
27-Business services	Scenario 1	-0.43	-4.93	101.16	-1.30	0.03	-0.59	-0.96	-5.78
	Scenario 4	0.05	-1.36	-7.25	-0.81	0.18	-3.33	0.73	-3.56
28-Energy and water supply	Scenario 1	-0.00	0.52	0.26	1.49	0.04	-0.50	2.53	-0.21
	Scenario 4	-0.01	-0.28	1.86	-0.14	0.04	-0.56	1.03	-0.84
29-Public interest services	Scenario 1	0.04	-0.18	0.94	0.05	0.21	-0.04	-0.55	-3.13
	Scenario 4	-0.01	-0.06	1.03	-0.28	0.13	-0.24	-0.07	-1.79
30-Communication	Scenario 1	-0.06	-0.09	3.46	9.29	0.25	0.25	1.17	25.34
	Scenario 4	-0.02	0.06	0.07	-1.02	0.12	-0.46	0.80	-1.84
31-Construction	Scenario 1	0.01	1.26	3.82	1.34	0.48	-0.23	3.24	1.54
	Scenario 4	0.01	0.31	0.13	-2.88	0.34	-0.72	0.73	0.25
32-Trade	Scenario 1	0.01	1.20	-4.43	0.89	0.29	0.94	3.49	-0.43
	Scenario 4	-0.01	0.19	-0.73	-1.65	0.16	-0.53	1.16	-0.37
33-Air Transport	Scenario 1	0.14	-0.13	-3.65	0.13	0.60	0.74	2.40	-0.98
	Scenario 4	0.01	-0.32	-1.01	-1.08	0.23	-1.04	0.86	0.14

Underlying such a large welfare gain, Malaysia will have important changes in its production: in scenario 1, production of business services will increase by more than 100%. The production of rice, leather and sugar is also positively affected. Almost all the production of the other sectors will decrease, as a result of the resource reallocation. Since factor reallocation is welfare enhancing, the magnitude of these changes explains the simulated gains. These changes in production will have a strong impact on labour market: skilled labour demand will rise by around 88% and unskilled labour by 101% in the business services sector.

For all countries, large differences can be observed between scenario 1 and scenario 4 due to the inclusion of services in the former. Services liberalisation involves large changes in production patterns and should thus be viewed as a key issue of this negotiation.

In Europe, the production of rice, leather and sugar is negatively affected (very heavily in the case of rice). In all other sectors, production increases.

Scenario 2: An FTA between the EU25 and the ASEAN, with exceptions.

This scenario is based on a limited liberalisation: the products excluded from liberalisation by the ASEAN under scenario 2 are those that have been excluded by at least one ASEAN country in the trade agreement signed with China (any product excluded by an ASEAN member vis-à-vis China is now excluded by all vis-à-vis the EU25). Their share in ASEAN imports from EU25 is negligible: 0.18%.

The products excluded by the EU25 are those that have been excluded either partially or totally in the trade agreement with Chile. Their share in EU25 imports from ASEAN is negligible too: 2.07% (1.35% for products that were fully excluded from the EU25-Chile agreement), but represent a significant part of agricultural imports. Services are not concerned by these exceptions.

Limited liberalisation usually translates into more limited welfare impacts in the case of multilateral liberalisation, but this is not always true for bilateral agreements where various distortions have to be tackled at the same time. It is therefore worth comparing the results of this scenario with those of scenario 1.

Table 5: Welfare, Variations in %, 2020.

Region	Scenario 1	Scenario 2
	Goods & Services	Sensitive Products
ASEAN	2.16	2.28
Indonesia	1.81	1.77
Malaysia	8.30	7.95
Philippine	1.12	1.87
Rest of ASEAN	0.29	0.10
Singapore	0.41	0.51
Thailand	2.63	2.74
Vietnam	2.22	2.26
EU25	0.10	0.11
China	-0.00	-0.02
India	-0.04	-0.02
Other developed countries	0.00	0.01
Other developing countries	-0.04	-0.04

Welfare gains are larger in the second scenario for the ASEAN countries as well as for the EU. The Philippines and Thailand will experience the largest differences. Accordingly, the sensitive products which were excluded from the FTA create further gains for these countries.

This result has to be taken with some precautions: due to the aggregation of products into larger sectors, a part of the negative impact of tariff dispersion is lost in the estimation. Therefore, the total exclusion of some products is represented in the model as a smaller reduction of tariffs in some sectors (with the exception of rice and sugar in the EU, that are fully classified as sensitive products). Our results only means that a smaller reduction in some agricultural sectors would lead to higher welfare gains, but the idea to do it introducing sensitive products that would not be liberalised at all would lead to an increase in tariff dispersion.

Another reason that can explain such an outcome is the perfect competition assumption for agriculture, to be compared with increasing returns to scale in the industrial sectors. These increasing returns come from variety gains, so that they do not benefit the producer. An increase in demand for agricultural products drives factors from the industrial sectors toward agriculture and leads to a sub-optimal solution. This is particularly true in countries where agriculture takes a large part of overall labour force. Lowering the elasticity of labour changes from agricultural sectors to non agricultural sectors to a very low value of 0.2 reverses the phenomenon by preventing this labour movement.

As a conclusion, the introduction of sensitive product in agriculture would lead to higher welfare gains for the ASEAN countries. However this result has to be taken with precautions because of methodological issues.

Table 6: Impacts on production.

Agricultural Sector	Scenario	EU25	Indonesia	Malaysia	Philippine	Rest of ASEAN	Singapore	Thailand	Vietnam	
01-Fishing	Scenario 1	-0.04	0.96	5.29	0.78		0.43	0.45	3.03	-1.53
	Scenario 2	0.01	0.86	4.77	1.30		0.31	0.93	2.31	-1.52
02-Primary products	Scenario 1	0.50	-2.06	-1.18	-0.25		-0.78	-1.63	1.30	-2.67
	Scenario 2	0.44	-1.95	-0.97	1.34		-0.12	-0.80	1.68	-2.81
03-Rice	Scenario 1	-50.19	1.88	12.43	2.94		6.67	6.87	13.45	1.52
	Scenario 2	0.55	1.12	3.45	1.01		0.72	1.72	0.87	0.05
04-Sugar	Scenario 1	-1.32	0.70	15.56	4.78		23.83	2.78	2.66	0.84
	Scenario 2	0.23	0.46	2.38	0.23		0.06	-0.26	0.74	-1.39
05-Poultry, rabbits and pork meat	Scenario 1	0.01	-0.48	-2.86	-3.36		-0.29	1.20	8.16	-24.83
	Scenario 2	0.14	-0.95	-4.26	-0.64		0.03	-0.63	2.31	-12.31
06-Animals and other meat	Scenario 1	0.04	0.26	3.53	-1.08		0.35	5.72	1.58	-0.11
	Scenario 2	0.02	0.06	2.35	0.37		0.36	0.24	1.63	0.45
07-Other agricultural products	Scenario 1	0.10	0.00	-2.08	0.03		-1.06	-0.61	-4.09	-2.42
	Scenario 2	0.07	0.05	-1.17	-0.73		-0.06	0.39	-1.04	-2.04
08-Vegetable oils and fats	Scenario 1	-0.30	-0.06	-2.79	1.94		0.81	-0.84	2.35	-5.02
	Scenario 2	-0.28	-0.42	-2.42	1.76		0.58	-0.89	2.53	-5.62
09-Beverages tobacco and dairy	Scenario 1	0.16	0.91	7.56	0.99		-0.05	-1.08	1.55	0.71
	Scenario 2	0.18	0.86	2.43	1.81		0.01	0.06	1.30	-0.31
10-Food products	Scenario 1	0.10	0.69	0.49	0.44		0.19	1.56	6.23	-7.81
	Scenario 2	0.15	0.43	-2.56	0.92		0.42	1.02	3.64	-7.40
Industrial Sector	Scenario	EU25	Indonesia	Malaysia	Philippine	Rest of ASEAN	Singapore	Thailand	Vietnam	
11-Apparel	Scenario 1	-4.12	13.12	-7.68	17.11		-1.51	0.07	4.15	33.25
	Scenario 2	-4.30	12.50	-3.71	15.16		-0.62	2.39	4.07	32.88
12-Textiles	Scenario 1	-2.51	9.71	-11.11	17.50		-0.38	-1.28	4.42	24.07
	Scenario 2	-2.80	9.73	-8.33	16.47		0.78	3.30	4.65	23.51
13-Leather	Scenario 1	-7.19	-8.29	16.70	-6.78		-3.06	22.33	1.90	17.78
	Scenario 2	-2.12	-2.08	-1.54	-1.34		0.09	-1.66	10.22	28.51
14-Wood products	Scenario 1	0.24	-2.72	-9.36	-0.08		0.37	-5.23	1.12	-1.70
	Scenario 2	0.19	-2.56	-7.49	1.24		1.02	-2.52	1.49	-1.94
15-Cars and trucks	Scenario 1	0.46	-2.22	-7.86	-5.61		0.18	-5.88	5.06	-11.70
	Scenario 2	0.43	-2.22	-6.40	-3.31		-0.03	-3.37	5.44	-12.24
16-Other transport equipment	Scenario 1	0.20	-4.86	-21.14	4.44		-0.85	-1.95	2.37	27.34
	Scenario 2	0.06	-4.56	-19.31	6.60		-0.33	0.02	2.94	26.88
17-Metal and mineral products	Scenario 1	0.27	-2.77	-9.35	0.44		0.21	-2.21	2.73	-0.62
	Scenario 2	0.24	-2.68	-8.53	2.90		-0.02	-0.87	3.37	-0.78
18-Paper and publishing	Scenario 1	0.06	-6.47	-4.25	1.05		0.11	-1.43	1.84	1.16

	Scenario 2	0.07	-6.37	-5.62	1.96	0.16	-0.25	2.23	1.17
19-Chemical rubber and plastic products	Scenario 1	0.19	0.30	-8.87	3.47	-0.09	-1.48	3.66	-3.81
	Scenario 2	0.21	0.39	-10.27	4.70	0.19	1.62	5.15	-4.34
20-Electronic equipment	Scenario 1	0.31	-4.05	-21.68	0.19	0.37	-4.01	6.25	-0.71
	Scenario 2	-0.24	-3.67	-18.11	3.64	-0.13	-0.34	9.03	-2.08
21-Machinery and Equipment	Scenario 1	0.53	-7.64	-17.98	0.63	-0.76	-5.69	3.90	-12.68
	Scenario 2	0.34	-7.37	-15.91	4.70	-0.96	-2.12	4.53	-13.77
22-Other manufactures	Scenario 1	0.45	-2.44	-1.40	1.13	-0.80	-4.38	1.49	-9.98
	Scenario 2	0.42	-2.36	-3.39	2.32	-0.79	-1.94	1.79	-9.51
23-Dwellings	Scenario 1	0.01	1.74	8.50	1.27	0.30	0.42	2.91	1.33
	Scenario 2	0.02	1.69	8.17	2.15	0.09	0.50	3.00	1.34

Services Sector	Scenario	EU25	Indonesia	Malaysia	Philippine	Rest of ASEAN	Singapore	Thailand	Vietnam
24-Transport	Scenario 1	0.40	-0.25	-1.43	0.06	0.87	2.13	2.86	2.74
	Scenario 2	0.38	-0.22	-1.30	0.52	0.92	2.71	2.90	2.82
25-Recreation and other services	Scenario 1	0.05	1.03	4.07	0.36	0.26	-1.32	1.81	-10.72
	Scenario 2	0.04	1.02	4.04	0.86	0.19	-0.84	1.95	-10.92
26-Financial services	Scenario 1	0.06	0.80	-2.80	-0.18	0.20	-0.61	1.32	-0.74
	Scenario 2	0.08	0.79	-3.06	0.53	0.03	0.03	1.57	-1.12
27-Business services	Scenario 1	-0.43	-4.93	101.16	-1.30	0.03	-0.59	-0.96	-5.78
	Scenario 2	-0.46	-4.95	105.72	-0.82	-0.08	1.07	-0.92	-6.04
28-Energy and water supply	Scenario 1	-0.00	0.52	0.26	1.49	0.04	-0.50	2.53	-0.21
	Scenario 2	0.01	0.52	-0.09	2.36	0.03	-0.03	2.88	-0.33
29-Public interest services	Scenario 1	0.04	-0.18	0.94	0.05	0.21	-0.04	-0.55	-3.13
	Scenario 2	0.05	-0.21	0.63	0.22	0.10	0.10	-0.76	-3.24
30-Communication	Scenario 1	-0.06	-0.09	3.46	9.29	0.25	0.25	1.17	25.34
	Scenario 2	-0.05	-0.10	3.36	10.10	0.15	0.51	1.41	25.10
31-Construction	Scenario 1	0.01	1.26	3.82	1.34	0.48	-0.23	3.24	1.54
	Scenario 2	0.02	1.23	4.00	3.76	0.16	0.25	3.78	1.51
32-Trade	Scenario 1	0.01	1.20	-4.43	0.89	0.29	0.94	3.49	-0.43
	Scenario 2	0.01	1.19	-4.48	2.14	0.13	1.21	3.99	-0.72
33-Air Transport	Scenario 1	0.14	-0.13	-3.65	0.13	0.60	0.74	2.40	-0.98
	Scenario 2	0.15	-0.12	-3.62	0.94	0.44	1.15	2.69	-1.03

The exclusion of a list of the most sensitive products on the EU market has an important impact on productions in some sectors. In the case of rice for instance, there is no more tariff reduction at all, so that rice exports from ASEAN countries do not increase any more. As a consequence, ASEAN rice productions do not increase any more, whereas EU production, which were halved under scenario 1, remains fairly stable under scenario 2. The same phenomenon holds in the sugar sector.

Regarding the assumptions made to define the list of sensitive products, it should be understood that this list is not necessarily the one that would be contemplated in the actual negotiations.

Scenario 3: FTA between EU25 and ASEAN, including two other FTAs in the baseline.

The last simulated scenario differs from the first one as a result of changes made to the pre-experiment. It allows an assessment of the impact of the same shock occurring in a different economic environment.

In this scenario, we introduce two potential future agreements. This possible change in the future trade policy may have an impact on the outcome of an EU-ASEAN FTA. The following results for scenario 3 will stress these possible differences.

Table 7: Welfare, Variations in %, 2020.

Region	Scenario 1	Scenario 3
	<i>Goods & Services</i>	<i>New other FTAs</i>
ASEAN	2.16	2.58
Indonesia	1.81	1.77
Malaysia	8.30	7.83
Philippine	1.12	2.93
Rest of ASEAN	0.29	0.32
Singapore	0.41	0.74
Thailand	2.63	3.05
Vietnam	2.22	2.35
EU25	0.10	0.09
China	-0.00	-0.04
India	-0.04	-0.02
Other developed countries	0.00	0.01
Other developing countries	-0.04	-0.05

Results reported in Table 7 point out significant differences between the scenarios.

The key to understanding and interpreting these differences is to appreciate that the global environment has become a lot closer to establishing free trade in scenario 3 as far as the members of the agreement at stake, ASEAN and the EU, are concerned. ASEAN continues to compete with MERCOSUR on the agricultural market. As a result of the EU-MERCOSUR FTA introduced in the pre-experiment scenario, ASEAN is now the only large agricultural region in the world facing EU tariffs in this sector. Thus, ASEAN would lose in the absence of an EU-ASEAN FTA. Hence the simulated impacts are larger than in scenario 1, as exemplified by the welfare gains. The same is true for the EU: if ASEAN concludes an FTA with all other industrialised countries, the EU would be the only industrialised region facing tariffs on the ASEAN market. Therefore, an FTA between the ASEAN and the EU would not only mean more liberalised trade, but also *less discrimination* between significant trade partners.

The importance of concluding an FTA is magnified by the fact that the EU and other industrialised countries compete to provide the same kind of goods and services, and within the same quality range. The structure of Mirage allows this specificity to be taken into account. On the other hand, ASEAN countries whose export structure is closer to the Mercosur one as far as the EU market is concerned are those for whom the difference between scenario 1 and 3 is the largest. Thailand and the Philippines are large agricultural exporters. Hence for them, an agreement with the EU becomes crucial if the EU were to conclude an agreement with Mercosur.

Table 8: Production, variations in %, 2020

Agricultural Sector	Scenario	EU25	Indonesia	Malaysia	Philippine	Rest of ASEAN	Singapore	Thailand	Vietnam
01-Fishing	Scenario 1	-0.04	0.96	5.29	0.78	0.43	0.45	3.03	-1.53
	Scenario 3	-0.02	1.01	4.98	2.25	0.44	0.89	3.36	-1.15
02-Primary products	Scenario 1	0.50	-2.06	-1.18	-0.25	-0.78	-1.63	1.30	-2.67
	Scenario 3	0.42	-1.60	-0.47	4.12	-0.50	-0.58	1.58	-2.33
03-Rice	Scenario 1	-50.19	1.88	12.43	2.94	6.67	6.87	13.45	1.52
	Scenario 3	-39.80	1.60	13.54	1.48	3.76	4.20	2.64	1.56
04-Sugar	Scenario 1	-1.32	0.70	15.56	4.78	23.83	2.78	2.66	0.84
	Scenario 3	-0.77	0.60	10.55	3.16	16.22	3.94	0.78	-0.87
05-Poultry, rabbits and pork meat	Scenario 1	0.01	-0.48	-2.86	-3.36	-0.29	1.20	8.16	-24.83
	Scenario 3	0.08	-0.17	-2.55	-2.86	-0.12	-2.56	5.17	-23.12
06-Animals and other meat	Scenario 1	0.04	0.26	3.53	-1.08	0.35	5.72	1.58	-0.11
	Scenario 3	0.13	0.29	2.20	0.34	0.23	-0.79	1.59	-0.22
07-Other agricultural products	Scenario 1	0.10	0.00	-2.08	0.03	-1.06	-0.61	-4.09	-2.42
	Scenario 3	0.08	0.08	-1.67	-0.72	-0.83	0.53	-2.15	-2.56
08-Vegetable oils and fats	Scenario 1	-0.30	-0.06	-2.79	1.94	0.81	-0.84	2.35	-5.02
	Scenario 3	-0.32	0.24	-1.85	1.94	0.65	-0.65	2.88	-5.85
09-Beverages tobacco and dairy	Scenario 1	0.16	0.91	7.56	0.99	-0.05	-1.08	1.55	0.71
	Scenario 3	0.14	0.92	7.29	3.01	-0.12	0.47	2.27	-0.01
10-Food products	Scenario 1	0.10	0.69	0.49	0.44	0.19	1.56	6.23	-7.81
	Scenario 3	0.07	0.83	0.53	1.97	0.09	2.09	6.97	-8.02
Industrial Sector	Scenario	EU25	Indonesia	Malaysia	Philippine	Rest of ASEAN	Singapore	Thailand	Vietnam
11-Apparel	Scenario 1	-4.12	13.12	-7.68	17.11	-1.51	0.07	4.15	33.25
	Scenario 3	-4.85	9.16	-6.49	8.72	-1.31	1.12	3.88	15.64
12-Textiles	Scenario 1	-2.51	9.71	-11.11	17.50	-0.38	-1.28	4.42	24.07
	Scenario 3	-2.83	8.00	-10.24	11.25	-0.61	0.08	4.16	6.83
13-Leather	Scenario 1	-7.19	-8.29	16.70	-6.78	-3.06	22.33	1.90	17.78
	Scenario 3	-1.11	-1.67	-3.08	-3.07	0.57	-3.57	11.71	14.48
14-Wood products	Scenario 1	0.24	-2.72	-9.36	-0.08	0.37	-5.23	1.12	-1.70
	Scenario 3	0.20	-2.13	-7.08	3.01	0.23	-2.57	1.22	-1.63
15-Cars and trucks	Scenario 1	0.46	-2.22	-7.86	-5.61	0.18	-5.88	5.06	-11.70
	Scenario 3	0.32	-1.85	-5.06	3.76	0.18	-2.09	5.59	-7.24
16-Other transport equipment	Scenario 1	0.20	-4.86	-21.14	4.44	-0.85	-1.95	2.37	27.34
	Scenario 3	0.16	-3.54	-16.71	9.45	-0.89	0.06	2.56	21.70
17-Metal and mineral products	Scenario 1	0.27	-2.77	-9.35	0.44	0.21	-2.21	2.73	-0.62
	Scenario 3	0.19	-2.17	-7.06	6.10	0.13	-0.50	3.16	-0.79
18-Paper and publishing	Scenario 1	0.06	-6.47	-4.25	1.05	0.11	-1.43	1.84	1.16

	Scenario 3	0.06	-5.29	-4.85	3.46	0.10	-0.34	2.30	0.72
19-Chemical rubber and plastic products	Scenario 1	0.19	0.30	-8.87	3.47	-0.09	-1.48	3.66	-3.81
	Scenario 3	0.18	0.57	-9.00	6.02	-0.21	0.69	4.61	-4.02
20-Electronic equipment	Scenario 1	0.31	-4.05	-21.68	0.19	0.37	-4.01	6.25	-0.71
	Scenario 3	-0.58	-2.49	-14.24	6.31	-0.16	2.27	9.05	-2.30
21-Machinery and Equipment	Scenario 1	0.53	-7.64	-17.98	0.63	-0.76	-5.69	3.90	-12.68
	Scenario 3	0.19	-5.99	-13.47	8.99	-1.00	-1.87	3.35	-12.79
22-Other manufactures	Scenario 1	0.45	-2.44	-1.40	1.13	-0.80	-4.38	1.49	-9.98
	Scenario 3	0.39	-1.84	-3.38	3.97	-0.71	-1.44	2.00	-9.10
23-Dwellings	Scenario 1	0.01	1.74	8.50	1.27	0.30	0.42	2.91	1.33
	Scenario 3	0.00	1.72	7.98	3.50	0.31	0.80	3.38	1.49

Services Sector	Scenario	EU25	Indonesia	Malaysia	Philippine	Rest of ASEAN	Singapore	Thailand	Vietnam
24-Transport	Scenario 1	0.40	-0.25	-1.43	0.06	0.87	2.13	2.86	2.74
	Scenario 3	0.47	-0.14	-1.10	1.23	0.87	2.59	2.93	1.52
25-Recreation and other services	Scenario 1	0.05	1.03	4.07	0.36	0.26	-1.32	1.81	-10.72
	Scenario 3	0.04	1.01	3.82	1.58	0.29	-0.90	2.08	-11.76
26-Financial services	Scenario 1	0.06	0.80	-2.80	-0.18	0.20	-0.61	1.32	-0.74
	Scenario 3	0.09	0.74	-2.73	1.70	0.15	0.03	1.57	-3.67
27-Business services	Scenario 1	-0.43	-4.93	101.16	-1.30	0.03	-0.59	-0.96	-5.78
	Scenario 3	-0.37	-4.65	102.73	0.17	0.03	1.38	-0.95	-6.84
28-Energy and water supply	Scenario 1	-0.00	0.52	0.26	1.49	0.04	-0.50	2.53	-0.21
	Scenario 3	-0.01	0.64	-0.03	3.53	0.06	0.10	2.93	0.04
29-Public interest services	Scenario 1	0.04	-0.18	0.94	0.05	0.21	-0.04	-0.55	-3.13
	Scenario 3	0.05	-0.18	0.70	0.41	0.22	0.17	-0.71	-3.45
30-Communication	Scenario 1	-0.06	-0.09	3.46	9.29	0.25	0.25	1.17	25.34
	Scenario 3	-0.03	-0.06	3.02	10.69	0.23	0.62	1.42	14.75
31-Construction	Scenario 1	0.01	1.26	3.82	1.34	0.48	-0.23	3.24	1.54
	Scenario 3	0.01	1.23	3.84	6.18	0.44	0.75	3.62	1.53
32-Trade	Scenario 1	0.01	1.20	-4.43	0.89	0.29	0.94	3.49	-0.43
	Scenario 3	0.00	1.23	-3.47	3.93	0.28	1.27	4.02	-0.49
33-Air Transport	Scenario 1	0.14	-0.13	-3.65	0.13	0.60	0.74	2.40	-0.98
	Scenario 3	0.16	-0.01	-3.08	2.19	0.57	1.03	2.69	-1.50

As in scenario 1, production patterns will change for all countries in all sectors. These changes can be quite different under this new scenario.

The Philippines is the country for whom the differences between the two scenarios are the most important. Differences are also very significant for Thailand in the leather sector, as well as in the rice sector.

Factor returns: comparison between the scenarios.

The impacts on production immediately translate into changes in factor returns and functional income distribution.

All scenarios would lead to a large increase in skilled worker wages.

In all scenarios involving liberalisation of services, Malaysia would exhibit the largest increase in skilled workers wages in the region as a result of its specialisation in services.

Table 9: Skilled real wages, variations in %, 2019.

Region	Scenario 1	Scenario 2	Scenario 3	Scenario 4
EU25	0.09	0.09	0.07	0.05
Indonesia	2.44	2.45	2.44	0.90
Malaysia	13.49	13.67	12.81	0.63
Philippine	2.14	3.99	6.14	-1.28
Rest of ASEAN	0.51	0.26	0.54	0.26
Singapore	0.55	0.86	1.34	-0.27
Thailand	3.95	4.72	4.77	1.45
VietNam	3.56	3.75	3.42	1.18
China	-0.01	-0.04	-0.08	0.01
India	-0.16	-0.14	-0.13	-0.12
Other developed countries	-0.05	-0.06	-0.06	0.00
PVD	-0.13	-0.15	-0.17	-0.06

Table 10: Unskilled real wages, variations in %, 2019.

Region	Scenario 1	Scenario 2	Scenario 3	Scenario 4
EU25	0.07	0.08	0.05	0.00
Indonesia	2.29	2.24	2.20	1.02
Malaysia	2.85	2.54	2.86	1.45
Philippine	1.83	2.86	4.33	-0.55
Rest of ASEAN	0.48	0.15	0.48	0.34
Singapore	0.91	0.62	0.87	0.83
Thailand	3.38	3.53	3.67	1.34
VietNam	4.72	4.83	4.76	2.04
China	-0.02	-0.03	-0.05	-0.03
India	-0.07	-0.05	-0.04	-0.12
Other developed countries	-0.02	-0.02	-0.02	-0.01
PVD	-0.07	-0.08	-0.09	-0.07

Unskilled labour would also benefit from the agreement, but to a lesser extent, with the sole exception of Vietnam. In scenario 4 with no services liberalisation, it is most often the converse that is true. Hence this rise in the skills premium can clearly be attributed to the rise in services activity, which generally requires a larger proportion of skilled labour.

Vietnam is an exception because the change in its production structure is oriented towards apparel, whereas services production declines.

Conclusion

In all scenarios which include liberalisation in services, all ASEAN members as well as EU25 countries would benefit from welfare gains. These gains are likely to be significant for most ASEAN countries. In the case of the Philippines, the reduction of protection in services would be crucial to obtain this result.

The gains are larger when some sensitive products are excluded from the liberalisation. This is mainly due to the fact that these sensitive products on the EU market are concentrated in agriculture, which is not supposed to feature increasing returns to scale. As a consequence specialising too much in agriculture can be sometimes welfare-worsening.

Under the last scenario, gains are also larger than under the first one. The existence of two other agreements creates higher gains but also different changes in the production system. Greater competition from other countries increases the need for an agreement between the EU and the ASEAN by permitting reduced tariff dispersion and avoiding a strong diversion effect produced by FTAs with other competitors.

The need for a trade agreement is thus greatest if the multilateral negotiations do not manage to facilitate trade on a broader scale. If bilateral negotiations are substituted for the multilateral process, it would become even more important for both parties not to exclude any important trade partner.

Appendix 1: Mirage Aggregation

Table 11 Mirage Aggregation

Mirage aggregation	Set of sectors	Remarks	Nb of GTAP sectors
1 Fishing	Primary	Priority sector	1
2 Primary products	Primary		7
3 Rice	Food		2
4 Sugar	Food		2
5 Poultry, rabbits and pork meat	Food		1
6 Animals and other meat	Food		3
7 Other agricultural products	Food		9
8 Vegetable oils and fats	Food		1
9 Beverages, tobacco and dairy	Food		2
10 Food products	Food	Priority sector	1
11 Apparel	Industry	Priority sector	1
12 Textiles	Industry	Priority sector	1
13 Leather	Industry		1
14 Wood products	Industry	Priority sector	1
15 Cars and trucks	Industry	Priority sector	1
16 Other transport equipment	Industry		1
17 Metal and mineral products	Industry		2
18 Paper and publishing	Industry		1
19 Chemical, rubber and plastic products	Industry	Trade: 4th + Priority sector	1
20 Electronic equipment	Industry	Trade: 1st + Priority sector	1
21 Machinery and Equipment	Industry	Trade: 3rd	1
22 Other manufactures	Industry		1
23 Dwellings	Industry		1
24 Transport	Services		2
25 Recreation and other services	Services	Priority sector	1
26 Financial services	Services		2
27 Business services	Services	Trade: 2nd	1
28 Energy and water supply	Services		3
29 Public interest services	Services	Priority sector	1
30 Communication	Services		1
31 Construction	Services		1
32 Trade	Services		1
33 Air Transport	Services	Priority sector	1

Table 12: Correspondence between GTAP sectors and our aggregation

GTAP sectors	% total trade	Mirage aggregation
Electronic equipment	20.98	Electronic equipment
Business services nec	16.61	Business services
Machinery and equipment nec	10.73	Machinery and Equipment
Chemical.rubber.plastic prods	6.50	Chemical, rubber and plastic products
Trade	6.24	Trade
Transport nec	3.12	Transport
Air transport	2.73	ATransport
Wearing apparel	2.60	Apparel
Leather products	2.54	Leather
Manufactures nec	2.20	Other manufactures
Textiles	2.03	Textiles
Recreation and other services	1.93	Recreation and other services
Wood products	1.82	Wood products
Motor vehicles and parts	1.79	Cars and trucks
Food products nec	1.60	Food products
Transport equipment nec	1.40	Other transport equipment
Insurance	1.33	Financial services
Sea transport	1.22	Transport
Paper products. publishing	1.15	Paper and publishing
PubAdmin/Defence/Health/Educat	1.07	Public interest services
Crops nec	1.05	Other agricultural products
Metal products	1.00	Metal and mineral products
Construction	0.94	Construction
Mineral products nec	0.94	Metal and mineral products
Ferrous metals	0.81	Primary products
Communication	0.76	Communication
Financial services nec	0.70	Financial services
Minerals nec	0.62	Primary products
Vegetable oils and fats	0.56	Vegetable oils and fats
Metals nec	0.55	Primary products
Meat products nec	0.47	Poultry, rabbits and pork meat
Beverages and tobacco products	0.45	Beverages, tobacco and dairy
Dairy products	0.35	Beverages, tobacco and dairy
Petroleum. coal products	0.29	Primary products
Coal	0.20	Primary products
Vegetables. fruit. nuts	0.13	Other agricultural products
Processed rice	0.10	Rice
Animal products nec	0.08	Animals and other meat
Electricity	0.06	Energy and water supply
Fishing	0.06	Fishing
Oil	0.06	Primary products
Water	0.04	Energy and water supply
Meat: cattle.sheep.goats.horse	0.04	Animals and other meat
Sugar	0.03	Sugar
Gas manufacture. distribution	0.03	Energy and water supply
Forestry	0.03	Other agricultural products
Paddy rice	0.02	Rice
Plant-based fibers	0.01	Other agricultural products
Oil seeds	0.01	Other agricultural products
Wheat	0.01	Other agricultural products
Gas	0.00	Primary products
Cattle.sheep.goats.horses	0.00	Animals and other meat
Cereal grains nec	0.00	Other agricultural products
Sugar cane. sugar beet	0.00	Sugar
Raw milk	0.00	Other agricultural products
Wool. silk-worm cocoons	0.00	Other agricultural products
	100.00	

Appendix 2: Presentation of MAcMap database.

Based on a joint effort devoted by the International Trade Centre –ITC– (UNCTAD & WTO, Geneva) and the CEPII to systematically collect detailed and exhaustive information on the level of applied tariff barriers, the MAcMap database uses a method to compute an exhaustive and consistent ad-valorem equivalent (AVE) measure of applied protection across the world, at the detailed product level. The MAcMap-HS6 database provides at the six-digit level of the Harmonised System (HS-6 level, 5,111 products), a set of consistent and exhaustive AVEs of applied border protection across the world in 2001, suitable for analytical purposes. 166 reporting countries are covered, with 208 partners.

NTBs are not considered for trade in goods.

In so doing, the main original contributions of MAcMap-HS6 are:

- (i) the exhaustive coverage of preferential trade arrangements (PTAs) across the world;
- (ii) the calculation of the AVE of specific duties, acknowledging the differentiated impact of such duties across exporters, depending on their export unit values;
- (iii) the incorporation of tariff-rate quotas (TRQs) both through the AVE of the resulting protection at the margin, and through the calculation of involved rents;
- (iv) an original aggregation methodology, using a weighting scheme based on reference groups of countries, and limiting the extent of the endogeneity bias inherent to the standard, import-weighted average protection.¹⁴

Here this database is used to construct the scenarios of trade liberalisation at the product level (HS6 level) before aggregating the data towards the sectors used in the CGE model. The advantage of such strategy is to fully take into account tariff peaks, exceptions and the possible non linearity of the applied tariff reduction formula, such as the Swiss formula (the latter formula does not concern the bilateral agreement under scrutiny, but the pre-experiment scenario that takes into account an expected outcome of the negotiations in the multilateral arena). In addition, information on the evolution of quota rents is extracted from the scenario and used in the modelling.

¹⁴ The aggregation procedure is another source of difficulties. While the corresponding questions have been already widely discussed (see e.g. Balassa, 1965; Laird, 1996), there is still no consensus about how to acknowledge the respective importance of products (as well as exporters and importers), without introducing too large biases. The widely used trade-weighted average, in particular, suffers from a well-known endogeneity bias, leading to an understatement of the restrictive impact of tariff duties