

VIETNAM'S ACCESSION TO THE WTO: *EX POST* EVALUATION IN A DYNAMIC PERSPECTIVE¹

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ABSTRACT. This paper aims to reassess the impact of Vietnam's accession to the WTO using a quantitative computable general equilibrium (CGE) approach. First, a recursive dynamic approach helps to better handle the effects of the commitments in the context of a rapid economic growth. Second, thanks to the *ex post* perspective, tariff line commitments are implemented at the 6-digits level of Harmonised System (HS6) using the official final schedule. Last, the WTO option is evaluated in a more realistic context where regional agreements involving Vietnam are represented. We show that WTO commitments signed in late 2006 by Vietnam for trade in merchandise should be positive for this economy, mainly through the benefits of the end of textile quotas from the United States. Welfare gains should represent around 1 percent of gross domestic product by 2015.

JEL Classification: D58; F13; F15.

Keywords: Computable General Equilibrium Model; Trade Policy;
World Trade Organization; Vietnam.

RÉSUMÉ. Cet article a pour objectif d'évaluer les effets de l'adhésion du Vietnam à l'OMC à l'aide d'une approche en équilibre général calculable. Une analyse dynamique récursive nous permet d'abord de mieux appréhender les effets des engagements pris dans un contexte de croissance économique rapide. Nous utilisons ensuite le calendrier final détaillé des réductions de droit de douane consolidés, que nous prenons en compte au niveau du Système Harmonisé à six chiffres (SH6). Enfin, les engagements pris par le Vietnam dans le cadre de l'OMC sont mis en perspective avec ceux liés à d'autres accords régionaux. Les résultats indiquent que les accords d'accession du Vietnam à l'OMC signés fin 2006 devraient avoir un effet positif sur cette économie en ce qui concerne le commerce de marchandises, notamment suite à la suppression des quotas sur le textile par les Etats-Unis. Les gains de bien-être devraient atteindre 1% du PIB en 2015.

Classification JEL : D58 ; F13 ; F15.

Mots-clés : Modèle d'équilibre général calculable; politique commerciale;
Organisation mondiale du commerce; Vietnam.

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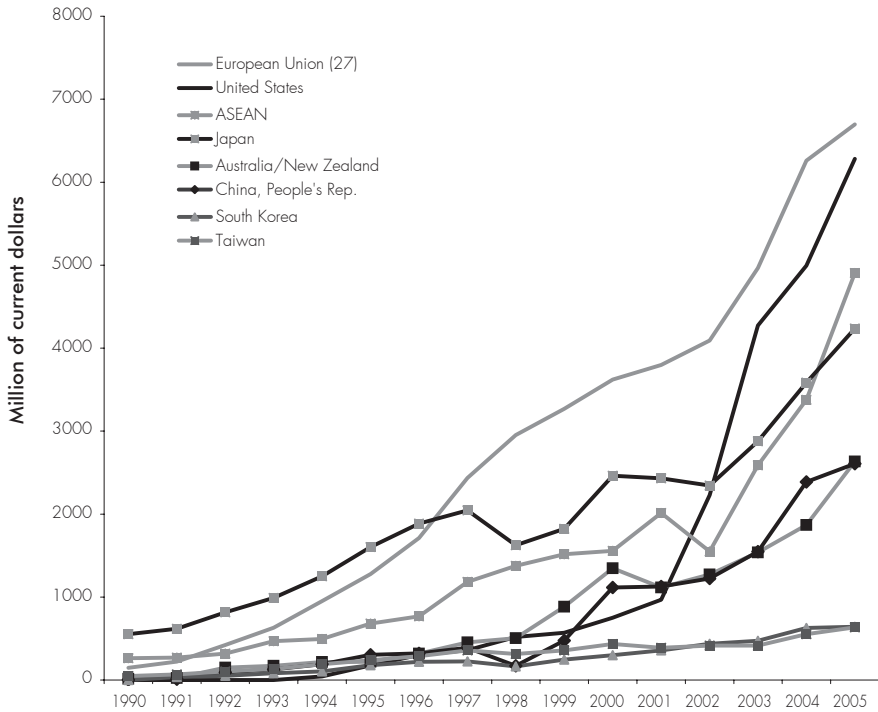
1. INTRODUCTION

Experiencing until 2008 a tremendous growth in the steps of China, Vietnam has been more and more scrutinised by the international community that is fascinated by the recovery of this communist country. The recognition of this success came to an apogee with the accession to the World Trade Organization (WTO) on January 11, 2007. The process of Vietnam's entree, started in 1995, was a continuation of the radical economic reform initiated ten years earlier ("Doi Moi"). Vietnam succeeded to open up rapidly and to achieve at the same time considerable development and social progress. The Vietnamese gross domestic product has been multiplied by 3 in volume from 1987 to 2006, with a sustained growth at an average rate of 7.3 percent.³ The country is today frequently cited as an example for poverty reduction policies and development achievements.

Vietnam's recent success has strongly relied on exports. They represented in 2005 more than 70 percent of gross domestic product (GDP) with a large share destined to developed countries (FIGURE 1). Exports have risen at an annual rate exceeding 17 percent on the period 2002-2007, under an industrial development pathway mimicking China's. The country has boosted its production on a few labour-intensive manufacturing sectors with high demand from developed economies, and valued its natural resources (oil, agricultural products) in a context of high prices. Imports are mainly sourced from regional producers: the Association of South-East Asia Nations (ASEAN), China and Taiwan feed the domestic market with processed goods and industries with raw materials, whereas high quality products used by exporting firms are mostly delivered by South Korea and Japan. An increasing inflow of foreign direct investments came to support this development helped by the stabilised political context.

3. Source: World Development Indicators.

Figure 1 - Vietnam's exports by destination



Source: CHELEM database 2007, CEPII.

In order to promote its trade, Vietnam has multiplied domestic reforms and trade agreements during the last decades. After the agreement with the European Union in 1992 and the end of the US embargo in 1994, Vietnam joined ASEAN in 1995. It obtained progressively access to the Most Favoured Nation (MFN) status in the European Union (EU) in 2004, Japan in 1999 and the United States of America (USA) in 2000, in exchange of partial tariff liberalisation and specific legal reforms. Some regional integration agreements followed: ASEAN Free Trade Agreement (AFTA, 2001), China-ASEAN (2002).

The concessions requested from Vietnam by other countries have been a debatable issue (Oxfam, 2004). Indeed, Vietnam had to make more commitments than older WTO entrants on topics such as domestic reforms and services liberalisation. Nevertheless, the accession seems to be the final mark of a long-prepared process rather than the beginning of a new era. To what extent can WTO accession participate to Vietnam's success? That is the main question we want to address in this paper.

Various answers have already been proposed by scholars. Most of them rely on assessments using static computable general equilibrium models. Several economists showed confident in the benefits of such an integration process using these tools. Roland-Holst *et al.* (2002) are the first to propose an assessment of WTO accession for Vietnam and predicts some

gains ranging from +0.2 percent to +3.3 percent in Vietnam's welfare. They address the question of dynamic by assuming different magnitude of productivity gains potentially driven by the opening up of the country. Other studies focus more on some specificities of Vietnam's economy. Dimaranan *et al.* (2005), modelling the accession to WTO with duty drawbacks, find that welfare should improve by 1 percent thanks to WTO commitments. They particularly stress the structuring role of the textile and garment sector supposed to benefit the most from the agreement. Nguyen and Ezaki (2005) defend a smaller contribution of the agreement to Vietnam's welfare by introducing some rigidities in the labour market (-0.1 percent to 0.7 percent).

However, most of these studies have been criticised for their methodological approach in a paper by Abbott *et al.* (2009). For these authors, the CGE approach fails in properly addressing the gains from trade, because they cannot reproduce the rapid surge in Vietnam's exports. Assessments have been essentially conducted with static models using an Armington specification which restricts the possible increase in the extensive margin of trade and therefore the observed trends cannot be reproduced.

Moreover, only one study uses tariff-level data (Dimaranan *et al.*, 2005) but it does not rely on the 2006 final commitments, neither it takes into account the effect of possible simultaneous regional trade agreements in the assessment.

This is why we propose to reassess the effect of the WTO accession and to investigate some of the flaws from the static approach. Implementing the final tariff commitments at the 6-digits level (HS6) of Harmonised System, the gains from accession will be addressed in a dynamic framework. Issues related to the high growth of Vietnam will therefore be looked at in order to see whether they constitute real constraints for the relevance of the analysis. Moreover, a particular attention will be paid to the simultaneous effect of regional integration in the assessment.

The paper is organised as follows. In Section 2, we will present the model and its assumptions. In Section 3, we will describe the scenarios and the changes they imply in tariff structure. In Section 4, we will comment the impact of the WTO scenarios, compare the standard results of a WTO accession to the observed trends and show how to improve results with a more precise baseline. In particular, we will focus on a few strategic sectors and see how better estimating quantitative restrictions is determinant to understand the outcome of these negotiations. We perform a few sensitivity analyses before concluding in Section 5.

2. A COMPUTABLE GENERAL EQUILIBRIUM APPROACH

In order to assess the effect of WTO accession, we use a quantitative approach grounded on the walrasian framework of general equilibrium. For this purpose, we work with an adapted version of the MIRAGE model, a multi-region multi-sector CGE developed at CEPII for trade policy analysis (Decreux & Valin, 2007).

2.1 General structure of the model

The MIRAGE⁴ model is a recursive-dynamic CGE representing optimising agents in different regions producing, consuming and trading a certain number of differentiated goods. Production of each sector is represented with a Leontieff function of intermediate consumptions and value added. Intermediate products are complementary with a Constant Elasticity of Substitution (CES) function with a 0.6 elasticity whereas capital, unskilled labour and other factors (natural resources or land) are substitute with a 1.1 elasticity.⁵ Natural resources are fixed, skilled labour is perfectly mobile and land is unperfectly mobile with a Constant Elasticity of Transformation (CET) of 0.5. Unskilled labour market has been represented as segmented (see below). Only skilled labour and capital are described more complementary, being included in a CES bundle with an elasticity of 0.6.

A representative agent consumes in each region following a Linear Expenditure System with Constant Elasticity of Substitution (LES-CES) optimisation program. The elasticity of substitution is set at 0.6 and savings are considered a fixed share of revenues. Investment is composed of the same capital goods composition for each sector and affected across sectors following the rate of return of capital. Foreign Direct Investments (FDIs) are explicitly represented, but their allocation follows the same rule as domestic investment.

Variation in trade is ruled by Armington Elasticities, taken from the GTAP database. However, two different quality zones are distinguished and imports from developing countries are considered less substitutable with imports from developed countries than with imports of the same zone (vertical differentiation). The current account minus variation of FDIs is considered constant as a share of world GDP, which implies adjustment of the real effective exchange rate in order to harmonise variation of exports, imports and FDIs.

The version of the model was run with perfect competition and a standard decreasing return to scale design. The dynamic in the model is driven by TFP assumptions (see above), accumulation of capital under a *putty-clay* framework (with a depreciation rate of 6 percent) and by projections of population, taken from UN forecast statistics and applied to the labour stock.

4. MIRAGE stands for Modelling International Relationships in Applied General Equilibrium.

5. Rigidity was introduced between energy and non-energy intermediate consumption in order to model the specific dependency of international demand to energetic goods. From a technical point of view, this was performed with the implementation of a double-tier constant elasticity of substitution function with an elasticity of 0.1 to represent complementarities between energetic and non energetic goods. Energetic and non energetic goods were then disaggregated in separate bundles. This change appeared important in the present modelling in order to reproduce the increasing share of crude oil in the value of Vietnamese exports.

The model is calibrated on the GTAP 6.2 database, which includes a Social Accounting Matrix (SAM) for Vietnam based on data from CIEM (Jensen *et al.*, 2004). As a result, the GTAP SAM of Vietnam represents a compromise between the structure of Vietnam economy in 2000 and trade flows in 2001. However, some data of the GTAP SAM have been adjusted for the study to better reflect the present context: for the three major exporting sectors in manufacture, the value-added share in production of Vietnamese sectors was fine-tuned thanks to data obtained from United Nations Industrial Development Organisation (UNIDO).⁶

GTAP sectors and regions aggregations have been chosen to adequately represent the structure of Vietnam sectors with its trade partners. Eleven regions are considered: Vietnam, ASEAN5, Australia/New-Zealand, China, EU27, USA, Japan, Korea, Rest of America, Rest of Asia, Rest of World. The GTAP sectors are aggregated into 26 activities, 8 of which are agriculture and primary sectors, 12 industries and 6 services (see TABLES A1.1 and A1.2, APPENDIX 1 for details).

Considering the specificities of Vietnam, the model includes some particular features presented below.

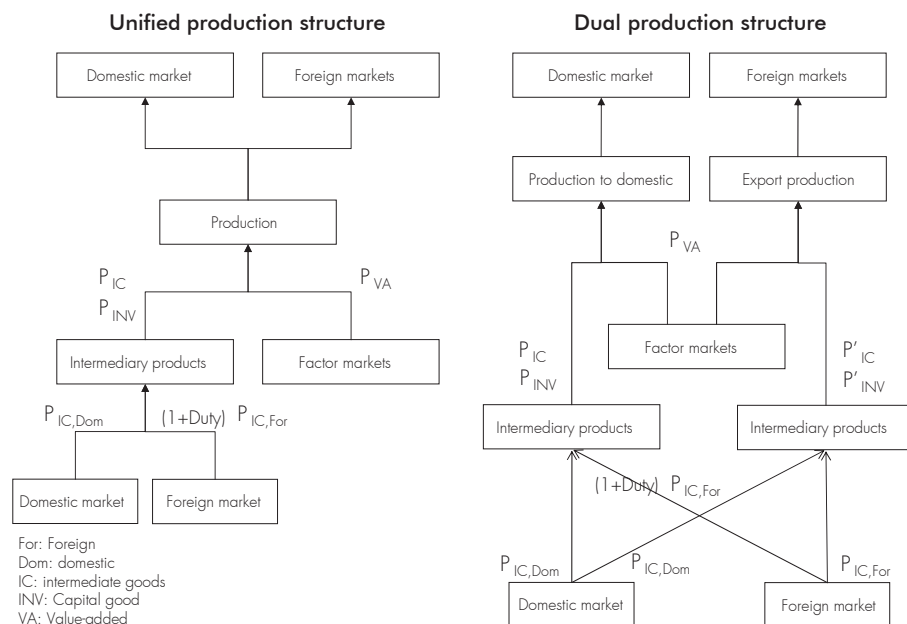
2.2. Dual production for duty drawbacks modelling

As explained by Ianchovichina (2004), the modelling of duty drawbacks strongly affects the magnitude of the results. For China, she finds that omitting duty drawbacks can lead to overestimate gains by 15 percent. Likewise, Vietnam applies duty-drawbacks for intermediate consumption by exporting firms. Taking them into account can decrease expected gains by 70 percent according to Dimaranan *et al.* (2005).

We therefore use a modified version of the model implementing the methodology introduced in the GTAP framework by Ianchovichina (*op. cit.*) and already applied to Vietnam by Dimaranan *et al.*. Production sectors of Vietnam are distinguished between exporting sectors and domestic production sectors. Factors are allocated proportionally to the output of the two categories of sectors, which means that sectors are initially calibrated from the same structure. Demand for goods is also split in two markets: a first market for final consumption goods, intermediate goods and capital goods used by producers for domestic markets; a second one for intermediate and capital goods used by the export industry (FIGURE 2). Last, a duty drawback "shock" is applied to imported goods and capital consumed by exporting industries by setting their tariffs to zero in the pre-experiment simulation. This allows to correct the bias due to the domestic and imported shares of intermediate consumption and capital. As export-oriented firms perceive a lower price on imported inputs as a result of duty drawbacks, a larger share of foreign intermediate consumption is then consumed by exporting firms.

6. From INDSTAT4 2007 database, value-added on production ratios were adjusted to 30.6 percent, 23.4 percent and 39.7 percent respectively for Leather, Textile and Apparel sectors, allowing to better reflect the situation of Vietnamese sectors relatively to other international competitors.

Figure 2 - Configuration of production with and without duty drawbacks



Source : The authors.

2.3. Labour market

The skilled labour market is considered perfect whereas unskilled labour market is modelled with a dual market structure. This design, tested in several CGE models (van der Mensbrugge, 2007; Decreux & Valin, 2007 for MIRAGE), relies on the distinction between a rural labour market for agricultural sectors and an urban labour market for industry and services ones.

For the rural labour market, agricultural sectors are modelled using the assumption of constant labour supply: at a given year, any shock bringing some extra migration from rural areas to cities lead to replacement of these workers due to underemployment (following the approach of Lewis, 1954). As a consequence, wages are set endogenously under an exogenous labour supply. On the urban labour market, prices are set exogenously. This means that any shock of demand from industrial or services sectors can be satisfied by the recruitment of rural workers, without any price tension on the urban labour market.⁷ The migration rate is controlled exogenously overtime relying on official projections. The overall effect of this dual labour market design is the possibility of increasing total active population in response to a

7. For a given year, response of labour supply to a shock is then determined endogenously. We check ex post that the added supply of labour remains small when compared with unemployment rate

demand shock by industrial sectors. This feature is inserted in our modelling only for a few regions: China, Vietnam, ASEAN5, Rest of Asia, and Africa/Middle-East. Labour supply in the baseline is imported from FAO statistics and corrected with ILO data in order to take into account the following evolutions: (i) demography, (ii) migration from rural to urban areas, (iii) move from unskilled to skilled category due to education. This creates an important lever for development. Because migrant workers boost their productivity when entering an urban sector, the labour force is expressed in number of workers instead of wage volume to apply the CET or the migration effect. For developed countries, we represent the imperfect mobility of workers with the CET specification.

3. DESCRIPTION OF THE TRADE POLICY SCENARIOS

As mentioned above, Vietnam's efforts to open up its economy began several years before applying for accession to WTO. The process of accession itself occurred simultaneously to numerous trade agreements or tariff schedule changes, more or less related to WTO requirements and doctrine. In 2001, base year of our study, Vietnam was in the middle of the process of negotiation with WTO countries and had launched the process of lowering some of its applied tariffs. The country was just starting the implementation of the bilateral trade agreement with the USA, a necessary step to succeed in its WTO application.⁸ Between 2001 and 2007, tariffs were also significantly reduced in accordance with regional commitments and bilateral negotiations. When Vietnam ratified the WTO commitments for accession on December 12, 2006, many efforts were in fact behind, concerning tariff barriers as well as other regulatory requirements.

In order to take into account an important part of the gains linked to WTO negotiations, the question of WTO impact on trade will be approached as follows: "What would have happened if Vietnam had stopped its WTO negotiation process in 2001, relying mainly on the ongoing and future Free Trade Agreements (FTAs)?" This perspective allows us to dissociate the effect of WTO accession from the other integration benefits following Vietnam opening up.

3.1. Baseline

Basically, using a dynamic framework, we compare the baseline path of Vietnam's economy from 2001 to 2015 (no accession to WTO) to the scenario considering the WTO accession.

8. The Vietnamese SAM delivered by the GTAP database apparently does not take into account the dramatic production and trade increase which followed application of MFN status by the USA to Vietnam in 2000. That is why we also implemented the associated change of tariffs in order to take this effect into account in the reference year (2001). Tariff values were extracted from Fukase & Martin (2000) and a pre-simulation was run on the 2001 year to adjust trade flows and the corresponding structure of the economy.

3.1.1. Assumptions on growth and total factor productivity

In our baseline, the model does not take into account endogenous dynamic gains on total factor productivity (TFP). Consequently, TFP in Vietnam is assumed to go on with its very fast growth rate trend for all the period considered. The average TFP is computed using exogenous GDP forecast, provided for Vietnam by the Vietnamese administration (Ministry of Planning and Investment). Their optimistic scenario mentions an annual growth rate of 8.5 percent till 2010 and 8 percent on the 2010-2015 period.⁹ For other regions, World Bank forecasts are used.

Two different baselines assumptions are then envisaged in order to better describe the structure of Vietnam's growth:

- an homogenous TFP equal to the average TFP observed,
- an heterogenous TFP, following some patterns given by IMF statistics. For domestic sectors, we use an exogenous differentiated TFP whereas for exporting sectors we compute the specific values of TFP growth allowing to match exports in the baseline. This is done while keeping as a global constraint the exogenous GDP forecast.¹⁰ Using this mechanism boosts production and intermediate input consumption in the fast growing exporting sectors.

3.1.2. Taking into account regional trade agreements

Several trade policy agreements are considered in the baseline, assuming a reciprocal progressive removal of tariffs during the implementation periods:

- ASEAN Free Trade Agreement (AFTA) from 2001 to 2015;¹¹
- Japan-ASEAN Free Trade Agreement from 2009 to 2015;¹²

9. After +8.5 percent GDP growth in 2007, the International Monetary Fund (IMF) forecasts a slight slowdown in 2008 at 7.3 percent. Vietnam GDP is then expected to rise again and be stable at a +8 percent average on the 2010-2013 period (IMF, 2008).

10. Because no ratios of TFP were available, TFP differentials for domestic oriented production were set equal to labour productivity differentials obtained from IMF. Using data on employment per sector from IMF (2007), we calculated on the 2001-2006 period that labour productivity had grown 4.2 percent in agriculture, 3.8 percent in industry, -1.8 percent in construction and 2.4 percent for services. For export-oriented industries, we introduced in the model the 2006 export values in constant 2001 dollars and computed the corresponding growth in sectoral TFP for exporting sectors. After 2006, we assumed a constant growth in TFP, assuming a linear evolution. Considering the finding from the new trade literature that exporting firms are more competitive than domestic oriented ones (Mélitz *et al.*, 2003; Baldwin *et al.*, 2006), we assume a higher TFP growth in the case of Vietnam exporting firms, especially considering that the government strongly supported investment in export oriented industries.

11. This agreement takes into account a list of sensitive products that are not liberalised. The list of 158 items excluded from any ASEAN FTA for Vietnam relies on the Vietnamese Common Effective Preferential Tariff (CEPT) list (www.us-asean.org/afsa.asp), classified in AHTN nomenclature (www.aseansec.org/15986.htm). We only take products that are considered as highly sensitive or the general exceptions.

12. In our baseline, it is assumed that this agreement should start in 2009 as planned by both parties following negotiations for the ASEAN-Japan Comprehensive Economic Partnership (AJCEP) Agreement, held in Singapore on November 2007. We kept for Vietnam the list of exception used for ASEAN and added rice as exception product on the Japanese side. Lists of exception are not yet available for this trade agreement.

- China-ASEAN Free Trade Agreement from 2004 to 2015;¹³
- ASEAN-Korea Free Trade Agreement;¹⁴
- US-Bilateral Trade Agreement in 2001.¹⁵

Other potential trade agreements under negotiation are not considered because they are too far from being signed. This is the case for the EU-ASEAN FTA, the AFTA-CER (ASEAN with Australia and New-Zealand), the ASEAN-India. In the same way, we neglected a potential Doha Development Agenda outcome. For all the regions not included in FTAs, no changes are applied on 2001 tariffs in the baseline.

3.2. Description of the WTO scenario

In this paper, we focus our analysis on the effect of the liberalisation in goods. We mainly deal with tariff reduction and include the effect of textile quotas removal.

3.2.1. Commitments on bound tariffs and changes in the protection structure

Vietnam's commitments for WTO accession incorporates a large number of tariff cuts, obtained after years of negotiations. The schedule of reduction plans a tariff decrease for 4,235 products among more than 10,000 tariff lines till 2014, most of them being implemented by 2012.¹⁶ Agricultural sectors remain protected with less than half of lines subject to cut with simple average bounds decreasing from 25.4 percent to 21.0 percent (left handside FIGURE 3). Industrial products lines have more important tariff peak cuts and are lowered in average from 16.2 percent to 12.4 percent (right handside FIGURE 3). All products covered by the Information Technology Agreement (ITA) are committed to enter duty-free in 2014 at the latest.¹⁷

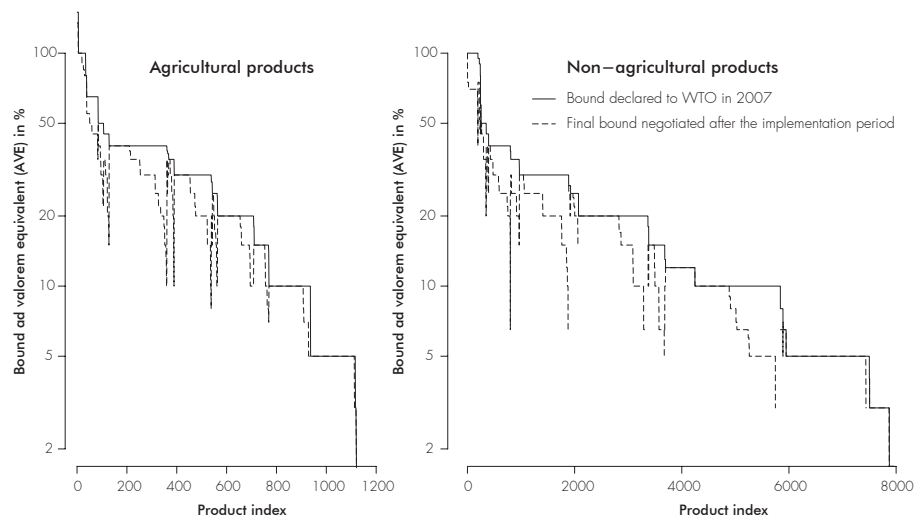
13. The tariff decrease occurs from 2004 to 2010 for ASEAN6 and China, from 2004 to 2015 for tariffs applied by Vietnam, Cambodia, Myanmar and Laos.

14. South Korea and 9 ASEAN countries signed this FTA in 2006 (Thailand is still negotiating about agricultural products at this date). Korea and the 9 ASEAN countries were considered eliminating tariffs on their products from 2006 to 2010 with a list of exception products. Korea sensitive products include highly sensitive rice, other agricultural products (poultry, garlic, onion, hot peppers, and most fruits) and some marine products (frozen and live fish) within the 3 percent category of highly sensitive products. On the ASEAN side, only sensitive products for the Vietnam were considered, like for the Japan-ASEAN FTA.

15. This important trade agreement signed in 2000 implemented significant changes in domestic regulation in order to improve the business climate for foreign firms. The application of MFN tariff by the USA to Vietnam constitutes a major change in the bilateral trade relations. On the Vietnamese side, commitments were made for opening market for 223 strategic products before the end of 2003. The list is available at www.usvtc.org/trade/bta/text.

16. Except for a few products such as Vehicule and Vehicule parts with some commitments going as far as 2019.

17. This agreement, signed by most WTO countries (representing 97 percent of trade), has been aiming at removing duties on all IT products. Vietnam has seven years of delay to apply this agreement on all its IT products imports.

Figure 3 - WTO cuts on Vietnam tariff bounds linked to accession

Note: Products are sorted at the tariff line level by decreasing order of ad valorem equivalent for 2007 bound value.

Source: Authors' representation; data from the report of the Working Party on the Accession of Vietnam, WTO (2007).

To properly represent these changes in the model, we compute tariff changes for each year of the 2001-2015 period at the HS6 level thanks to the MACMap-HS6 v1 database (5113 products) and aggregate them using the reference group methodology (5 reference groups in the world) in order to limit aggregation bias.¹⁸ In the baseline and in the scenario, all tariff cuts from FTAs are kept.

At the aggregation level of the study, data show the extent of Vietnam's opening. Its tariffs decrease from an average weighted aggregate of 19.6 percent in 2001 down to 11.3 percent in 2015 under intra-ASEAN, ASEAN-China, ASEAN-Japan and ASEAN-Korea trade agreements. The simulation with WTO accession leads to an average protection of 8.9 percent. This decrease in tariff barriers is progressive in accordance with FTA or WTO commitments.¹⁹

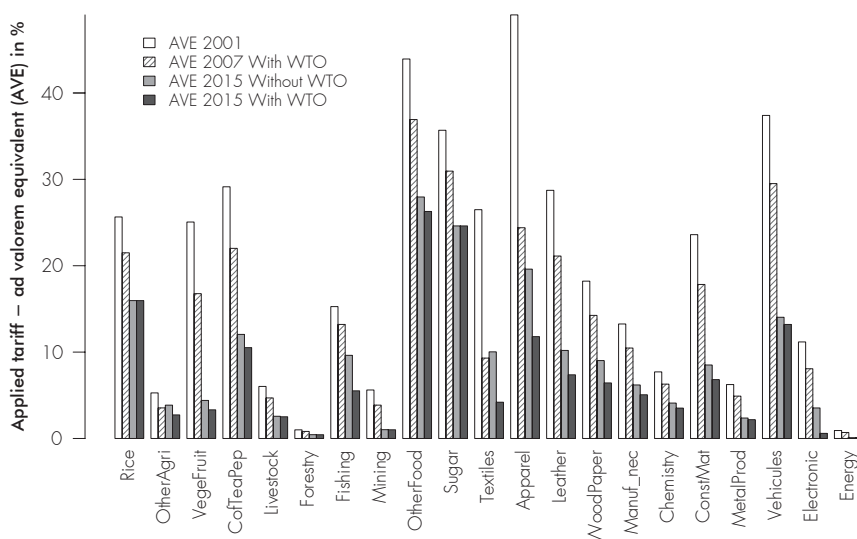
The sectoral decomposition shows high heterogeneity in the exposure of Vietnamese sectors. Most important effects on imports are driven by the regional integration and many sectors are concerned by the trade liberalisation. The impact of WTO commitments is however more effective on a few sectors: for agriculture, meat, fruits and vegetables undergo a significant

18. See Bouët *et al.* (2004) for a complete description of the database and the aggregation methodology.

19. Weights come from BACI (CEPII data base) trade flows in 2001 aggregated in five reference groups of countries for the aggregation from the HS6 level to the GTAP level; GTAP trade flows data in 2001 were then used for the upper aggregation level and reference group for Vietnam was constituted from ASEAN + China + Rest of Asia. The aggregates computed this way are larger than biased *ad valorem* equivalent computed from country trade weights. The figures obtained are in that case 16.2 percent, 7.7 percent and 5.3 percent respectively.

opening when comparing baseline and WTO scenario (FIGURE 4). On the manufactured products side, textile and apparel, as well as leather are more strongly exposed under the WTO scenario. The electronic sector undergoes a strong liberalisation following the implementation of the Information Technology Agreement (ITA) by Vietnam. However, major parts of intermediate products used by these sectors are already exempted of duties, through a mechanism of duty drawbacks for exporting firms (for a more detailed description, see Dimaranan *et al.*).

Figure 4 - Protection structure of Vietnam by sector



Source: MAcMapHS6 v1, CEPII 2004; authors' calculations.

Concerning Vietnam's trade partners, tariffs faced by Vietnam do not change significantly after WTO accession. The USA is the last WTO member not applying MFN tariffs in 2000 to Vietnam. As a consequence, exports are mainly to be affected through the end of quotas on textile and apparel sectors. European Union's quotas were considered to be removed in 2004 and the US quotas in 2007 if Vietnam enters WTO.

3.2.2. The phasing out of textile quotas

Aiming at accompanying the transition of textile sectors for developed countries which were threatened by the expansion of the Asian industry, the Multi-Fibre Agreement has set up a regime of quotas for many years on Asian products in the framework of the General Agreement on Tariffs and Trade (GATT). The phasing out of quotas was scheduled for 2005 in compliance with the Agreement on Textiles and Clothing signed in 1995 by WTO members. In order to prepare for the WTO accession of Vietnam, the European Union removed their last quotas on Vietnamese exports of textile in 2004 but the USA maintained them till the accession of Vietnam to WTO. Therefore, after the end of the Agreement on Textile and

Clothing for WTO countries in 2005, Vietnam was one of the last countries exposed to this kind of restrictions (a notable exception however is the Memorandum of Understanding signed between the US and the EU with China to agree on some delayed full access to their domestic markets).

We supposed for the scenarios that if Vietnam had withdrawn from WTO negotiation in 2001, neither the European Union nor the USA would have removed these quotas. Indeed, such a decision would have affected drastically the pattern of trade between these countries. Actually, when US tariffs on Vietnamese products went down from non-MFN (Most Favoured Nation) to the MFN regime in 2001, exports to North America jumped from \$80 million to \$2,340 million in only two years.

In order to introduce quantitative equivalents to these restrictions into the model, we first use tax exports equivalents computed by Francois & Spinanger (2004). However, following Dimaranan *et al.*, we replace the null values for the EU by an *ad valorem* equivalent (AVE) of 10 percent on textile and apparel products. In a different scenario, on the basis of some observed trends, we endogenously approximate a tax equivalent in order to reproduce the past exports of this sector.

4. EFFECTS OF ACCESSION TO WTO

Several shocks are conducted in order to distinguish some effects in the trade agreement (Sim 1-3) but also to see how a better representation of the baseline and the quota AVE estimates could help to refine the results (Sim 4-5). The five shocks tested are presented in TABLE 1.

Table 1 - Description of the different shocks studied for Vietnam's accession to WTO

Name	Baseline	Shock
S1	Baseline with FTAs and homogenous TFP	WTO scenario with drop of AVE for quotas
S2	Baseline with FTAs and homogenous TFP	WTO scenario without drop of AVE for quotas
S3	Baseline without FTAs with homogenous TFP	WTO scenario and regional FTAs
S4	Baseline with FTAs and heterogenous TFP	WTO scenario with drop of AVE for quotas
S5	Baseline with FTAs and heterogenous TFP	WTO scenario with endogenously computed end of quotas

4.1. The standard approach

From scenario S1 to S3, we test the model with the standard modelling of liberalisation. The liberalisation effects induced by the accession to the WTO are found limited when comparing the simulation scenario ("Vietnam development with WTO tariff reduction") to the baseline ("Vietnam development without WTO tariff reduction"). Indeed, the country improves its welfare

by +0.9 percent in 2015 through the new tariff schedule and the end of quotas, which represents a gain of \$598 million (S1).²⁰

Table 2 - WTO accession: main aggregate results for the scenarios S1 to S3

Variation in 2015	(S1)	(S2)	(S3)
GDP	2.4%	0.5%	3.7%
Exports (value)	8.4%	0.8%	18.8%
Imports (value)	7.0%	0.9%	20.9%
Terms of trade	-1.4%	-0.1%	-3.0%
Real effective exchange rate	0.96%	-0.2%	-2.7%
Real wages unskilled	1.59%	0.4%	4.5%
Real wages skilled	1.79%	0.93%	7.8%
Capital return	6.4%	0.6%	12.3%
Foreign direct investment	4.7%	1.0%	16.3%
Welfare	0.9%	0.36%	1.5%

(S1) WTO with end of quotas.

(S2) WTO without end of quotas.

(S3) WTO and FTAs.

Source: Authors' calculations with MIRAGE.

Following Dimaranan *et al.*, we decompose the results with (S1) and without quota phasing out (S2). The end of quotas accounts for 61 percent of total gains: modelling the same effect without taking into account quotas removal leads to gains of only +0.4 percent in 2015 (TABLE 2).

The distribution of results across sectors clearly illustrate the structuring effect of the end of quotas (TABLE A1.3, APPENDIX 1). Variations obtained are large, even if they remain modest when compared to the very fast growth that these sectors experience in reality. Effects on non textile exports are all negative. Even if this point can surprise, it is simple to be clarified. Domestic production increases for some of these sectors, thanks to an increase of demand. However, exports drop in relative terms, in a context of rapid growth for Vietnam, when quotas are phased out. In the case where quotas are not phased out, it appears that all sectors experience an increase in their exports under the WTO accession.

These gains can be compared to those obtained with the cumulative effect of WTO agreement and regional trade agreement (S3).²¹ In this case, we find that GDP gains are +3.7 percent while total welfare gains represent +1.5 percent for the cumulative impacts of all openness policies.

20. In this section, values are expressed in 2001 US dollars.

21. For this, we incorporate all trade agreements signed by Vietnam in the simulation scenario and not in the baseline as before.

4.2. Better reproducing structural changes

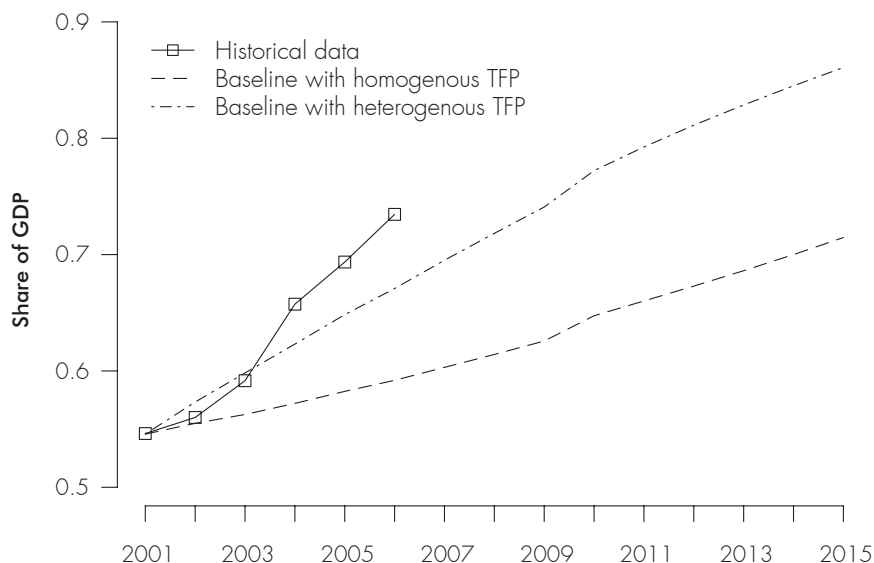
Using a dynamic modelling to assess Vietnam's gains from WTO accession appears an important requisite considering the deep structural changes that the country experienced for two decades, in a high growth environment. Trade expanded even more quickly than growth with an average annual rise of 16.9 percent and 19.6 percent respectively in imports and exports between 2000 and 2005. On this aspect, standard dynamic assumptions are not satisfactory. The model assumes a growth rate of 8 percent for Vietnam's GDP but Armington constraints prevent trade to grow at a higher rate when relative prices of imports do not vary. Although they tend to decrease through tariff changes, it is not enough to explain historical data, as illustrated by Abbott *et al.*.

We propose in this section to take advantage of the dynamic framework to better reproduce these trends and improve our results. Even though the values of Armington elasticities will always remain constrained in a CGE approach (as long as one relies on Armington rule for explaining cross flows at the aggregated level), we use sectoral TFPs in our dual production structure to adjust to the dynamic path.

In scenarios S1 to S3, growth is computed exogenously for Vietnam. GDP growth is converted into a homogenous TFP variation applied to different sectors in the model. This means that sectors producing non tradable or little tradable goods grow as much as exporting sectors, before reallocation of new workers and investment. In the case of Vietnam, this assumption is not realistic because value added and exports rose more in some sectors than in others, which cannot be obtained in a model under standard assumptions on accumulation of capital and reallocation of labour. Moreover, IMF statistics show significant variations in labour productivity across main sectors (agriculture, industry services) and we can anticipate higher heterogeneity among industrial sectors.

We therefore test the scenario S1 with a different baseline where all TFP are sector-specific (see Section 3.1). This improved baseline allows to better reproduce the opening of Vietnam's economy by fitting more closely the intensification of trade. FIGURE 5 shows the difference obtained in the increase of export as share of GDP between the two baselines.

Another explanation for trade increase comes from the role of extensive margins with trade of new varieties. This probably plays a role for Vietnam but not as large as one could expect, as illustrated by a detailed analysis at the HS6 line level (TABLE 3).

Figure 5 - Exports as share of GDP in the different baselines

Source: Historical data from World Development Indicators, 2008; Authors' calculations for model baseline.

Table 3 - Increase in exports flows and HS6 products composition for Vietnam

	1999	2000	2001	2002	2003	2004	2005
Exports in Agriculture (\$ million)	1 923	1 600	1 462	1 471	1 870	2 447	3 011
<i>(number of HS6 lines)</i>	339	362	368	377	387	407	411
<i>% change in number of HS6 lines</i>	6.6%	6.8%	1.7%	2.4%	2.7%	5.2%	1.0%
Exports in Industry (\$ million)	8 285	11 397	11 927	13 983	18 952	24 227	29 078
<i>(number of HS6 lines)</i>	2237	2521	2575	2700	2863	2973	3065
<i>% change in number of HS6 lines</i>	3.8%	12.7%	2.1%	4.9%	6.0%	3.8%	3.1%
Total	10 208	12 997	13 389	15 454	20 822	26 673	32 088
<i>(number of HS6 lines)</i>	2576	2883	2943	3077	3250	3380	3476
<i>% change in number of HS6 lines</i>	4.2%	11.9%	2.1%	4.6%	5.6%	4.0%	2.8%

Source: BACI Data Base, Author's calculations.

An important consequence of changing the baseline concerns the share of trade in textile and garment in 2015. In our central scenario, with homogeneous TFP gains, exports from this sector were expected to be worth \$10.5 billion in 2015. With the new assumptions of heterogeneous productivity growth, we obtain in the baseline \$8.2 billion in 2010 and almost \$15 billion in 2015. As a consequence, the effect of quota removal appears more significant through a fall in terms of trade. Instead of a gain of 0.9 percent in 2015, the increased expansion of textile leads to a net loss of -0.4 percent through a depreciation in the terms of trade (-1.9 percent). This change in results shows the sensitivity of results to the modelling of the textile and apparel sector, and its quantitative trade restriction measurement. This is why we propose a last simulation to refine this projection and improve results having a more detailed focus on textile and apparel exports.

4.3. Improving textile and garment export effect

The previous simulations illustrate how the benefits of Vietnam's accession to WTO can depend on the magnitude of garment sector exports (and to a lesser extent, textile exports). According to the Vietnamese Information Agency, exports of textile and garments have experienced a very large increase in 2007, in accordance with what could be expected by the modelling. Exports amounted \$7.8 billion, among which \$4.3 billion to the USA. The Vietnamese government now anticipates \$9.5 billion exports for the year 2008, much faster than was planned in the 2006-2010 Development Plan (\$7 billion in 2008 and \$10 billion in 2010), making textile and garment exports the first source of export revenues.

The surge anticipated by the model for 2007 is more important than the one effectively recorded in 2007. Indeed, from 2006 to 2007, the model announces a +54 percent increase in textile and garment exports instead of the 34 percent observed. For the sake of comparison, the effect of the quota increase is not modeled the following year and the growth of exports is +24 percent, mainly driven by productivity growth and new investments. This result is closer to the expected increase of +22 percent observed in reality, and reflects the relevance of TFP growth calibration.

However, the overestimation by the model of Vietnamese exports increase to the US market in 2007 (from \$1.5 billion in 2006 to \$4.2 billion in 2007) deserves further investigation. It suggests two things: first, exports to the US were constrained more in 2001 than the single tariff barrier reported by Fukase and Martin (2000) would suggest. Second, the critical value of quota AVE used in the modelling so far and taken from Francois & Spinanger (*op. cit.*) is probably too large.²² In order to correct the first bias, we assume in a new simulation an additional non-tariff barrier related to the ante-USBTA period, set to the same value as the tariff barrier. Then we estimate the value of export AVE which reproduces the effect of US quotas removal in 2007 in order to better reproduce the Vietnam-US textile-garment trade

22. This is in fact without surprise as Francois & Spinanger are very prudent on the robustness of their quota equivalent estimate for Vietnam, who went through important trade policy changes during the period considered in their study.

between 2006 and 2008. By reducing the export tax equivalent by 40 percent, we obtain in the model a rise of 35 percent for Vietnam garments exports to the US.

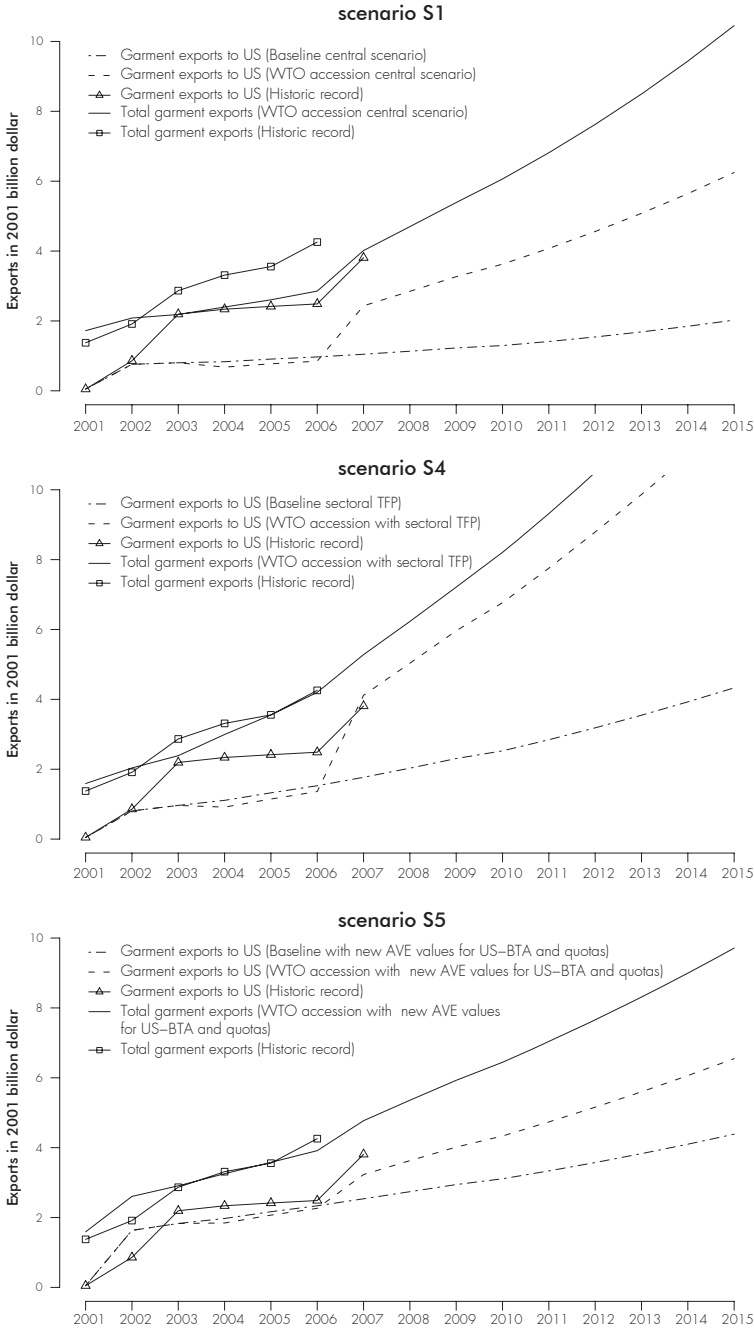
Results obtained with this new estimate are given in TABLE 4. They show less important effects on exports of textile and garment (FIGURE 6).

The nature of the results raises two questions. First, we wonder whether there is a risk of deterioration in terms of trade as suggested by the surge in textile and garment following WTO accession. Using the BACI database,²³ we find no clear evidence that there is an overall decrease in prices of textile-garment when compared with prices of all exports from Vietnam: we find for garment a decrease of 8 percent on the 1996-2001 period and a 5 percent increase on the 2001-2004 period; however, prices of textile exports decrease by 14 percent over the eight-year period. Considering US import prices in textile and garment, there is a significant decrease over the period for the US: -15 percent for textile and -8 percent for garment. This suggests that the improved access to the US market could lead to a drop in Vietnam's export prices following WTO accession.

The second question is related to the distribution of gains and losses due to a larger market access for Vietnamese textile and clothes. China is shown as the losing competitor of Vietnam in case of WTO accession. Indeed, overall market shares of China and Vietnam on the US market both increased during the recent period, as illustrated by Chaponnière *et al.* (2007). However, at a more detailed sectoral level, Vietnam shows to be more competitive than China on some HS6 lines. On the US market, where Vietnam ships a large part of its exports, the country is well positioned in several textile and garment segments (see TABLE A1.5, APPENDIX 1). The four largest HS6 exports from Vietnam are present on this market with shares in volume exceeding of a third that of China's. Vietnam's volume of exports to the US is larger than China's for five products.

23. The BACI database, developed at CEPII, provides harmonised HS6 bilateral trade flows in value and in volume for over 200 countries. Description of the BACI database is available on www.cepii.fr/anglaisgraph/bdd/baci.htm.

Figure 6 - Evolution of apparel export following three different dynamic specifications



Source: Authors' calculations.

4.4. Comparison of scenario results

As we have seen, the dynamics of some sectors can influence dramatically the outcome of trade policy shocks. In the case of Vietnam, it modifies significantly the results (TABLE 4): welfare gains vary slightly (+1.1 percent instead of +0.9 percent in the central scenario) but effects on growth appear more remarkable (+1.5 percent instead of +2.4 percent). Trade effects are also notably different, with exports twice larger in scenario S1 (+8.4 percent) compared to scenario S5 (+4.3 percent). This illustrates the importance of focusing on historical trends to better reproduce the sectoral dynamics in this type of assessment.

Table 4 - WTO accession: Summary of the results for the different simulations

Variation in 2015	Percent change				
	(S1)	(S2)	(S3)	(S4)	(S5)
GDP	2.4	0.5	3.7	1.6	1.5
Exports (value)	8.4	0.8	18.8	10.7	4.3
Imports (value)	7.0	0.9	20.9	10.5	4.1
Terms of trade	-1.4	-0.1	-3.0	-1.9	-0.7
Real effective exchange rate	1.0	0.2	2.7	1.5	1.0
Real wages unskilled	1.6	0.4	4.5	1.7	1.5
Real wages skilled	1.8	0.9	7.8	0.5	1.6
Capital return	6.4	0.6	12.3	8.9	5.1
Foreign direct investment	4.7	1.0	16.3	5.6	3.7
Welfare	0.9	0.4	1.5	-0.4	1.1

(S1) WTO with end of quotas - Homogenous TFP.

(S2) WTO without end of quotas - Homogenous TFP.

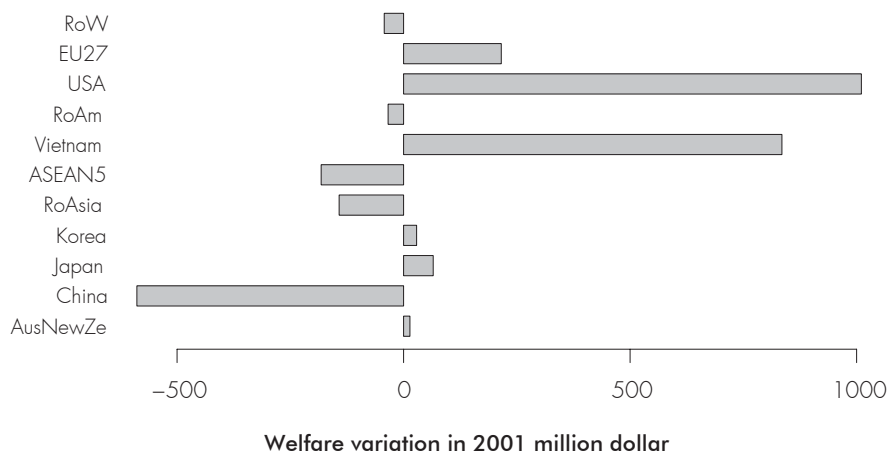
(S3) WTO plus FTAs on the period 2001-2015 (ASEAN, China, Japan, Korea).

(S4) WTO with end of quotas - sectoral TFPs.

(S4) WTO with end of quotas - sectoral TFPs and improved AVE for garments quotas.

Source: Authors' calculations with MIRAGE.

Considering that the end of quotas plays a significant role in Vietnamese exports burst, it is not surprising that the US and the EU make a large benefit from this accession in scenario S5 (\$1,010 million and \$217 million respectively), because of the decrease of apparel prices on their domestic market (FIGURE 7). China losses (-\$589 million) symmetrically reflect the loss of market share following this new opportunity offered to Vietnam's textile. ASEAN5 losses (-\$182 million) can be explained by the decreasing importance of the regional AFTA in a more multilaterally opened world. It is noteworthy that in scenario S1, results are more contrasted with benefits for the US reaching \$1,178 million and China losing -\$710 million. This comes from the stronger surge of exports related to the overestimated AVE in scenario S1.

Figure 7 - Distribution of gains between countries in scenario S5

Source: Authors' calculations.

Because production is less stimulated in scenario S5 than S1, social indicators are not as good as initially estimated. The WTO scenario leads to a rise of employment in industry by 4.3 percent in scenario S5 against 5.2 percent for scenario S1 in 2015, driven by the expansion of major exporting sectors. The creation of activity increases the average wage of unskilled labour by 1.5 percent, mainly thanks to the hiring of new workers into better paid activities (migrants from rural areas and workers from informal urban sector). This is considered under the assumption that wages are maintained at their level in real terms thanks to the margin made by the industry sectors, which can be debated in a context of high inflation (+8.3 percent in 2005 (GSO), and by far higher in the beginning of 2008). Skilled workers should experience a 1.6 percent increase of their real wages, mainly explained by the tension induced by needs of the expanding industry. As we have already considered in the model an increase in skilled labour resource, this appreciation of wages suggests that the supply growth estimated could not be enough for responding to the fast development requirements.

The most striking difference among these scenarios concerns the welfare and the terms of trade effects with respect to the end of textile quotas. Scenario S1 suggests that the end of quota should generate significant terms of trade decrease (-1.4 percent) although real effective exchange rate appreciates. As producers lose their rent, this leads to a relative loss of welfare. Scenario S5 comes to revise the value of this rent and defends that welfare benefits should finally be higher because the rent is not as large as initially estimated. Because terms of trade deteriorate by only -0.6 percent, welfare finally appears stronger than in scenario S1, in spite of a smaller GDP.

4.5. Sensitivity analyses

In order to test the effects of different critical parameters on the results, a few sensitivity analyses are conducted as a last step of this exercise. The results of these tests are shown in TABLE 5. We focus on the last scenario (S5) as it appears to be the most refined from the different approaches we have developed. Three parameters are tested.

i) Armington elasticities: the scenario (S5) is assessed with different values of Armington elasticity (+33 percent and -25 percent) in order to test the effect on Vietnam's imports. In this scenario, the substitution elasticities are unchanged for Vietnam's exports of textile and apparel.

ii) Import elasticities for textile and apparel: in the standard specifications, substitution elasticities are assumed the same for all regions. For textile and apparel, this elasticity equals 7.5 for textile and 7.4 for apparel. We test new values of this elasticity with +33 percent and -25 percent to see the effect on Vietnam's indicators.

iii) Mobility of investment: last, we test the effect of changing the calibrated coefficient for investment dynamics. Increasing this coefficient (α in the model) allows more responsive investment when the return rate on capital increase. On the contrary, a decrease of α represents inertia in investment reallocation and more limited structural adjustments.²⁴

Table 5 - Sensitivity analyses on the S5 scenario - Results in 2015

	(S5)	Percent change					
		Armington elasticities		Textile import elasticities		Mobility of investment	
		-25%	+33%	-25%	+33%	-50%	x 2
GDP	1.5%	1.6%	1.4%	0.6%	3.5%	1.4%	1.5%
Exports (value)	4.3%	5.2%	3.0%	1.9%	9.3%	3.6%	4.8%
Imports (value)	4.1%	4.8%	3.0%	1.7%	9.1%	3.3%	4.7%
Effective exchange rate	1.0%	1.3%	0.7%	0.2%	2.7%	0.7%	1.3%
Tems of trade	-0.7%	-0.8%	-0.6%	-0.3%	-1.0%	-0.6%	-0.8%
Welfare	1.1%	1.2%	1.1%	0.4%	3.1%	1.2%	1.1%

Source: Authors' calculations with MIRAGE.

The most sensitive parameters for this assessment appears to be the import elasticities that Vietnam's textile and apparel exports face. Decreasing the value of these elasticities by 25 percent divides the welfare benefits for Vietnam by three. On the opposite, assuming more sensitivity to price for countries importing Vietnam's textile boosts Vietnam's production and induces significant additional welfare gains. This shows how much the assessment outcome depends on the assumptions for this sector. Other parameters influence less the results. GDP and welfare react little to change on Armington elasticities or change in investment dynamics, although trade appears sensitive to these changes.

24. In MIRAGE, the investment function for each sector is expressed as $I=A*K \exp(\alpha*W_k)$ with I for investment, K for installed capital, W_k for return on capital, α an investment mobility parameter and A a calibrated parameter.

5. CONCLUSION

In this paper, we studied the effect of Vietnam's accession on its merchandise trade in a CGE framework. Our analysis leads us to several conclusions.

From a policy point of view, it appears that Vietnam commitments and gains in the negotiation process should benefit the country. Welfare gains are estimated to be around 1 percent of GDP at the end of the schedule implementation (2015 for most products). These gains are the results of the tariff decrease on imports (for 39 percent of it) and of the new market access for textile and garment (for 61 percent of it). Predicting the evolution of the garment sector, which became the first exporting sector for Vietnam in 2008, is however a delicate task which strongly conditions the nature of the results. As shown by our sensitivity analysis, a precise assessment of these gains also requires a good knowledge of elasticity parameters for these sectors. Actually, the success of Vietnam economic development appears dependent on the capacity of the country to diversify both its exporting goods and its export markets as it relies heavily on western demand (EU27 and USA). Considering the rapid development of Vietnam and the integration level of its economy in the world trade, gains could also come from more intangible benefits, such as market reforms as well as a stimulated domestic competition.

From a technical point of view, this work also supports a few ideas.

First, dynamic modelling matters for high growth economies. Determining the best way to take into account structural changes in this kind of assessment deserves further investigations. However, our study shows that reproducing past structural changes and assuming continuation of the observed trends change the nature of results compared to a static approach.

Second, considering duty drawbacks is important for assessing trade policies of countries using this instrument. As shown by the difference between our figures and those from different papers, the range of results can be large, depending on the ratio of imports which is assumed to be intermediate consumption of exporting firms. Determining more precisely this parameter should help to find a consensus on the value of gains which is effectively overestimated without this modelling feature.

For analysts as for modellers, lessons to learn from countries like Vietnam remain numerous as this country is an excellent illustration of rapid integration in the international market combined with a fast economic mutation and an impressive rhythm of development.

H. B. & H. V.²⁵

25. We thank the economists from Vietnam's Ministry of Planning and Investment for their help. Special thanks to economists from CEPII for helpful technical discussions and for patient readings.

APPENDIX 1

Table A1.1 - Regional aggregation used for the modelling

Name	Description	GTAP code (version 6.2)
Vietnam	Vietnam	VNM
ASEAN5	Indonesia, Malaysia, Philippines, Singapore, Thailand	IDN, MYS, PHL, SGP, THA
AusNewZe	Australia, New Zealand, other Oceania	AUS, NZL, XOC
China	China, Hong-Kong	CHN, HKG
EU27	Member States of the European Union	AUT, BEL, DNK, FIN, FRA, DEU, GBR, GRC, IRL, ITA, LUX, NLD, PRT, ESP, SWE, BGR, CYP, CZE, HUN, MLT, POL, ROM, SVK, SVN, EST, LVA, LTU
USA	United States of America	USA
Japan	Japan	JPN
Korea	South Korea	KOR
RoAm	Rest of North and Latin America countries	CAN, MEX, XNA, BOL, COL, ECU, PER, VEN, ARG, BRA, CHL, PRY, URY, XSM, XCA, XFA, XCB
RoAsia	Rest of Asian countries	TWN, XEA, KHM, XSE, BGD, IND, PAK, IKA, XSA
RoW	Rest of the World	CHE, XEF, XER, ALB, HRV, RUS, XSU, TUR, IRN, XME, EGY, MAR, TUN, XNF, BWA, ZAF, XSC, MWI, MUS, MOZ, TZA, ZMB, ZWE, XSD, MDG, NGA, SEN, UGA, XSS

Table A1.2 - Sectoral aggregation used for the modelling

Name	Description	GTAP correspondence
Rice	Paddy rice, Processed rice	pdr, pcr
OtherAgri	Cereals, Oil seeds, Sugar cane. Sugar beet, Plant-based fibers, Raw-milk, Wool. silk-worm cotton	wht, gro, osd, rmk, wol
VegeFruit	Vegetables. Fruits. Nuts	v_f
CofTeaPep	Crops nec (coffee, tea, pepper)	ocr
Livestock	Animals and animal products	ctl, oap
Forestry	Forestry	frs
Fishing	Fishing	fsh
Mining	Coal, Oil, Gas, Mineral nec	coa, oil, gas, omn
OtherFood	Meat, Vegetable oil and fats, Dairy products, Food products nec, Beverage and tobacco products	cmt, omt, vol, mil, ofd, b_t
Sugar	Sugar	sgr
Textiles	Textiles	tex
Apparel	Wearing apparel	wap
Leather	Leather products	lea
WoodPaper	Wood products, Paper products, Publishing	lum, ppp
Manuf_nec	Petroleum and coke products, Machinery, Manufacture nec	p_c, ome, omf
Chemistry	Chemical, rubber and plastic products	crp
ConstMat	Mineral products nec	nmm
MetalProd	Metals and metals products	i_s, nfm, fmp
Vehicules	Motor vehicules and parts, transport equipment nec	mvh, otn
Electronic	Electronic equipment	ele
Energy	Electricity and gas manufacture and distribution	ely, gdt
Construct	Construction	cns
BusServ	Water, Communications, Financial services nec, Insurances, Business services nec, Recreation and other services, Dwellings	wtr, cmn, ofi, isr, obs, dwe
Trade	Trade	trd
Transport	Transports	otp, wtp, atp
PubServ	Public administration, defence, health, education services	osg

Table A1.3 - Main results on export and output change in scenario S1

2001 million \$	Without quotas						With quotas					
	Output		Domestic		Exports		Output		Domestic		Exports	
	Value	Variation	Value	Variation	Value	Variation	Value	Variation	Value	Variation	Value	Variation
Rice	24	0.2%	22	0.2%	2	0.2%	3	0.0%	36	0.3%	-33	-3.5%
OtherAgri	-0	0.0%	-2	-0.8%	2	0.5%	-6	-0.8%	2	0.7%	-8	-1.8%
VegeFruit	-15	-0.4%	-20	-0.7%	5	0.9%	-11	-0.3%	0	0.0%	-11	-2.2%
CofTeaPep	2	0.2%	-0	-0.4%	2	0.3%	-13	-1.2%	-5	-4.1%	-8	-0.9%
Livestock	8	0.2%	8	0.2%	0	0.2%	11	0.3%	13	0.4%	-2	-2.1%
Forestry	-4	-0.3%	-4	-0.3%	0	0.3%	-48	-3.6%	-47	-3.6%	-1	-4.0%
Fishing	-2	-0.1%	-2	-0.1%	0	0.2%	-36	-1.1%	-34	-1.1%	-2	-2.8%
Mining	7	0.1%	7	0.4%	0	0.0%	-39	-0.4%	4	0.2%	-43	-0.5%
OtherFood	-28	-0.3%	-59	-0.9%	31	0.8%	-322	-3.0%	-166	-2.5%	-156	-3.9%
Sugar	3	0.4%	3	0.4%	0	0.4%	-11	-1.2%	-9	-1.0%	-2	-4.1%
Textiles	54	1.0%	12	0.4%	41	1.8%	2,026	37.9%	893	29.0%	1,133	50.0%
Apparel	85	1.2%	-15	-1.7%	100	1.7%	6,056	86.9%	139	15.2%	5,917	97.7%
Leather	340	1.8%	109	1.7%	230	1.8%	-1,092	-5.7%	-400	-6.2%	-692	-5.4%
WoodPaper	-16	-0.3%	-29	-0.8%	13	0.7%	-222	-4.0%	-120	-3.2%	-102	-5.8%
Manuf nec	81	1.0%	15	0.7%	66	1.1%	-274	-3.3%	-53	-2.4%	-221	-3.7%
Chemistry	95	0.6%	42	0.4%	53	1.0%	-527	-3.5%	-259	-2.6%	-268	-5.0%
ConstMat	12	0.1%	7	0.1%	5	0.6%	-23	-0.3%	28	0.3%	-51	-5.6%
MetalProd	81	1.1%	72	1.1%	9	1.2%	-120	-1.6%	-85	-1.3%	-35	-4.7%
Vehicules	24	0.6%	20	0.5%	4	0.8%	-116	-2.7%	-95	-2.5%	-21	-4.1%
Electronic	34	1.4%	10	3.2%	24	1.1%	-45	-1.8%	-1	-0.3%	-44	-2.0%
Energy	26	0.4%	26	0.4%	0	0.3%	-89	-1.3%	-88	-1.3%	-1	-11.1%
BusServ	58	0.3%	54	0.4%	4	0.2%	-326	-1.9%	-224	-1.5%	-102	-5.0%
Construct	112	0.4%	111	0.4%	1	0.5%	264	1.0%	270	1.1%	-6	-3.2%
Trade	70	0.5%	69	0.5%	1	0.4%	131	0.9%	145	1.0%	-14	-4.2%
Transport	30	0.7%	25	1.0%	5	0.3%	4	0.1%	20	0.8%	-16	-1.0%
PubServ	31	0.2%	31	0.2%	0	0.0%	-19	-0.1%	17	0.1%	-36	-4.9%
Total	1,111	0.5%	512	0.3%	599	1.0%	5,156	2.4%	-19	0.0%	5,175	8.8%

Source: Authors' calculations.

Table A1.4 - Review of past studies in CGE on trade agreements for Vietnam

Name	Nb of scen.	GDP (Welf)		Exp.		Imp.		Model characteristics	Baseline	Scenarios
		Min	Max	Min	Max	Min	Max			
Fukase and Martin (2000)	3	[0.4]	[-2.4]	0.9	12.1	NA	NA	GTAP static	Modified GTAP4 database	Granting of MFN by USA;
Fukase and Martin (2001)	5	-4.7	1	3.9	15.2	3.1	12,8	GTAP static	Modified GTAP4 database	Sensitivity analysis: +/- 50% on elasticities
Roland-Holst et al. (2002)	7	0.2	3.3	0.6	12.1	NA	NA	CNAM single country model (World Bank style) with dynamic gains	VN SAM 2000 (Jensen, 2004) Business as Usual	WTO accession; WTO accession + China productivity growth; Trade boost from USBTA; FDI boost
Nguyen and Ezaki (2005)	5	-0.06	-0.68	1.73	18.24	3.15	15.39	Static multiregion, dual labour market, exogenous wage for formal sector	GTAP6	3 Regional FTAs Regional FTA + Bilateral FTA Japan + US Multilateral liberalisation
Dimaranan et al. (2005)	2	6.74	7.88	15.22	18.81	NA	NA	GTAP static multiregion, duty-drawbacks	End of ATC, EU quota, IC rebalancing	WTO accession schedule; +33% Deeper liberalisation
Huung and Vanzetti (2006)	6	1	15	-2	57	-1	37	GTAP static, exogenous wage for unskilled labour	GTAP6	-100% Unilateral; Harmonised 10% level unilateral; -100% Bilateral (EU); -100% Regional; -50% WTO members Opening; -100% World
Fujii and Roland-Holst (2007)	3	-0.27	5.31	-0.82	20.5	-1.28	27.5	GTAP static linked to a single micro simulation model		-100% Vietnam; -100% Vietnam + Improved market access; Partial opening Vietnam

Source: Adapted from Abbott et al. (2009). Update from Cling et al. (2007) and completed by the authors.

Table A1.5 - Market shares of Vietnam and its major competitors on the US wearing apparel market in 2005
(20 largest HS6 export flows from Vietnam to the US)

HS6 Code	Description	Vietnam	Bangladesh	China	Indonesia	India	Thailand	Turkey	US Imports (mio \$)	Vietnam/China
620462	Women's trousers and shorts of cotton	4.8%	3.8%	11.0%	4.7%	2.3%	1.9%	1.9%	6 060	0.44
620193	Men's anoraks and similar articles, of man-made fibres	19.1%	7.4%	46.9%	2.3%	0.6%	2.7%	0.0%	925	0.41
620342	Men's trousers and shorts, of cotton	2.8%	6.3%	8.0%	2.6%	2.7%	0.8%	0.9%	5 099	0.35
620520	Men's shirts of cotton	4.1%	12.6%	7.2%	8.8%	10.9%	1.6%	2.6%	2 798	0.57
610510	Men's shirts of cotton, knitted or crocheted	6.3%	2.0%	3.2%	4.0%	13.8%	5.8%	0.6%	1 660	2.01
620293	Women's anoraks and similar articles, of man-made fibres	14.3%	4.8%	61.1%	3.6%	1.5%	1.6%	0.1%	721	0.23
610610	Women's blouses, shirts of cotton, knitted or crocheted	8.9%	2.7%	4.7%	4.0%	2.9%	3.3%	0.9%	965	1.91
650590	Hats and other headgear, knitted or crocheted	9.9%	15.4%	43.5%	1.3%	0.3%	0.4%	0.0%	742	0.23
620343	Men's trousers and shorts of synthetic fibres	5.0%	5.3%	15.7%	8.0%	3.6%	1.5%	0.1%	1 304	0.32
620413	Women's suits of synthetic fibres	36.6%	0.0%	29.2%	8.5%	0.3%	5.7%	0.1%	176	1.25
620463	Women's trousers and shorts of synthetic fibres	5.8%	3.0%	13.9%	13.2%	1.5%	1.4%	4.2%	1 081	0.42
610462	Women's trousers and shorts of cotton, knitted or crocheted	5.9%	0.7%	12.2%	3.6%	1.6%	1.1%	2.6%	1 053	0.48
621040	Men's garments of textile fabrics with plastics	17.9%	6.0%	45.6%	5.2%	0.5%	4.2%	0.0%	302	0.39
620433	Men's jackets and blazers of synthetic fibres	12.8%	2.3%	33.4%	7.1%	1.4%	2.6%	2.2%	404	0.38
610230	Women's overcoats, car-coats, capes, cloaks	20.2%	3.9%	16.0%	2.4%	1.5%	2.2%	0.4%	253	1.26
610130	Overcoats, car-coats, capes, anoraks, incl. ski-jackets	20.6%	6.1%	6.0%	5.4%	2.7%	2.7%	0.2%	243	3.45
611120	Babies' garments of cotton, knitted or crocheted	4.3%	1.6%	45.1%	2.4%	4.7%	13.9%	0.5%	894	0.10
620530	Men's shirts of man-made fibres	6.1%	8.6%	17.7%	5.3%	2.5%	1.4%	0.1%	620	0.35
611420	Special garments for professional, n.e.s., of cotton	7.7%	0.5%	13.1%	2.6%	4.8%	1.8%	2.7%	489	0.59
621050	Women's garments of textile fabrics, with plastics	19.5%	7.4%	39.6%	1.7%	0.6%	3.6%	0.0%	181	0.49

Source: BACI Data Base (2007) and authors' calculations.

REFERENCES

- Abbott, P., Bentzen, J., Tarp, F., 2009. Trade and development: Lessons from Vietnam's past trade agreements, *World Development* 37 (2), 341-53.
- Baldwin, R.E., Forslid, R., 2006. Trade liberalization with heterogenous firms, NBER Working Paper 12192.
- Bouët, A., Bureau, J.-C., Decreux, Y., Jean, S., 2004. Multilateral agricultural trade liberalization: The contrasting fortunes of developing countries in the Doha Round, CEPII Working Paper 2004-18.
- Chaponnière, J.-R., Cling, J.-P., 2009. Vietnam's export-led growth model and competition with China, *Économie internationale*, in this issue.
- Cling, J.-P., Marouani, M. A., Razandrakoto, M., Robilliard, A.-S., Roubaud, F., 2008. The distributive impact of Vietnam's accession to the WTO, *Économie internationale*, in this issue.
- Decreux, Y., Valin, H., 2007. MIRAGE, updated version of the model for trade policy analysis focus on agriculture and dynamics, CEPII Working Paper 2007-15.
- Dimaranan, B.V., Duc, L.T., Martin, W., 2005. Potential economic impacts of merchandise trade liberalization under Viet Nam's accession to the WTO, paper for the 8th GTAP Conference on Global Economic Analysis, Lübeck.
- Dimaranan, B.V., McDougall, R.A., Eds., 2005. Global trade, assistance, and production: The GTAP 6 data base, West Lafayette/Indiana: Center for Global Trade Analysis, Purdue University. (www.gtap.agecon.purdue.edu/databases/v6/v6_doco.asp).
- Francois, J., Spinanger, D., 2004. Liberalizing quotas on textiles and clothing: Has the ATC actually worked?, paper for the 7th GTAP Conference on Global Economic Analysis, Washington, D.C.
- Fukase, E., Martin, W., 2000. The effects of the United States granting MFN status to Vietnam, *Weltwirtschaftliches Archiv/Review of World Economics* 136(3), 539-59.
- Fukase, E., Martin, W., 2001. A quantitative evaluation of Vietnam's accession to the ASEAN free trade area, *Journal of Economic Integration* 16(4), 545-67.
- Huong, P.L., Vanzetti, D., 2006. Vietnam's trade policy dilemmas, Technical report, GTAP Working Paper.
- Ianchovichina, E., 2004. Trade policy analysis in the presence of duty drawbacks, Policy Research Working Paper Series 3312, The World Bank.
- IMF, 2007. Vietnam: Statistical appendix, IMF Staff Country Reports, International Monetary Fund.
- IMF, 2008. World Economic Outlook, April, Technical report, International Monetary Fund.

- Jensen, H.T., Rand, J., Tarp, F., Huong, P L., Minh, D.H., 2004. A new Vietnam social accounting matrix for the year 2000, Nias-CIEM Working Paper, Central Institute for Economic Management.
- Lewis, A.W., 1954. Economic development with unlimited supplies of labor, *Manchester School of Economics and Social Studies* 22, 139-91.
- Méltiz, M.J., 2003. The impact of trade on intra-industry reallocations and aggregate industry productivity, *Econometrica* 71(6), 1695-1725.
- Nguyen, T.D., Ezaki, M., 2005. Regional economic integration and its impacts on growth, poverty and income distribution: The case of Vietnam, *Review of Urban and Regional Development Studies* 17(3), 197-215.
- Oxfam, 2004. Extortion at the gate: Will Vietnam join the WTO on pro-development terms?, Oxfam Briefing Paper 67.
- Roland-Holst, D., Tarp, F., An, D.V., Thanh, V.T., Minh, D.H, 2002. Vietnam's accession to the World Trade Organization: Economic projections to 2020, CIEM Discussion Paper 0204, Central Institute for Economic Management.
- The Socialist Republic of Vietnam, 2006. The five-year socio-economic development plan 2006-2010, Report to the Government.
- van der Mensbrugge, D., 2007. Modeling the impact of trade liberalization: A structuralist perspective?, paper for the 10th GTAP Annual Conference on Global Economic Analysis, West Lafayette.