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Vietnam's Accession to the WTO: Ex-Post Evaluation in a Dynamic Perspective
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VIETNAM'S ACCESSION TO THE WTO: EX-POST EVALUATION IN A DYNAMIC PERSPECTIVE

NON-TECHNICAL SUMMARY

Vietnam's accession to the World Trade Organisation (WTO) on January 11, 2007 has symbolised the recognition by the international community of decades of efforts to modernise its economy. As the country relies strongly on trade, most observers anticipate benefits from this new step of Vietnam's opening up, with commitments on bound tariffs, investment measures, barriers to trade in services. However, assessing more quantitatively the effect of this broad agreement remains a delicate task.

This paper intends to prolong the works on effects of Vietnam's integration to the world economy by focusing on WTO trade commitments, using a quantitative computable general equilibrium (CGE) assessment, with enhanced features. We bring new elements to the debate by a more precise implementation of final tariff commitments at the 6-digits level of Harmonised System (HS6) and by the comparison with the alternative effect of regional agreements involving Vietnam. The modelling notably accounts for duty drawbacks applied by Vietnam, which limits trade liberalisation benefits for exporting firms.

We show that the 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 USA. Welfare gains should represent around 1% of gross domestic product by 2015. These gains will be the results of the tariff cuts on imports (for 39% of it) and of the new market access for textile and garment (for 61% of it). The success of Vietnam economic development however appears dependent on the capacity of the country to diversify both its exporting goods and export markets. Moreover, we show that the dynamics of the labour market will be critical to allow a full development of the economic potential, which implies managing internal rural migrants and sustain education efforts.

From a more methodological perspective, the case of Vietnam and WTO is interesting because the country is developing at a high pace. Significant structural changes occur making necessary to look closely at the dynamic of the agreement implementation. This exercise also shows us how some technical specifications can be critical for results in a trade CGE analysis. Choices on labour market or current account closure are important, as well as features describing the details of the trade policy implementation, like duty drawback mechanisms, can significantly influence the results and have to be carefully considered for this type of works.

ABSTRACT

Vietnam's accession to the World Trade Organisation (WTO) on January 11, 2007 has represented the outcome of decades of efforts to modernise its economy. In this paper, we propose a new general equilibrium assessment of Vietnam's accession to WTO using a dynamic approach and benefiting from the ex-post perspective offered one year after the membership acceptation. We rely on a dynamic global model incorporating duty-drawbacks and taking into account tariff changes at the HS6 level. A particular attention is paid on the sensitivity to dynamics assumptions and labour market closure. Our results show that gains for Vietnam linked to WTO accession are positive for trade in merchandises, but highly dependent on the evolution of textile and apparel sectors, whose exports were boosted by the commitments.

L'Entrée du Vietnam à l'OMC :
Une Evaluation en Equilibre Général

RESUME NON TECHNIQUE

L'entrée du Vietnam à l'Organisation Mondiale du Commerce (OMC) le 11 janvier 2007 représente l'aboutissement d'années d'efforts déployés par cet Etat pour moderniser son économie. Etant donné le degré d'ouverture du pays, les analyses se sont montrées optimistes sur les gains à obtenir de cette accession, à travers les engagements du Vietnam sur les réductions tarifaires, les règles sur l'investissement, et l'ouverture aux échanges de services. Néanmoins, évaluer plus précisément ces gains demeure un exercice délicat.

Ce papier présente les résultats d'une évaluation en équilibre général de l'impact sur l'économie vietnamienne de l'accord d'adhésion. L'apport essentiel de ce travail est, d'une part, de mener cette évaluation au niveau fin des produits auquel sont pris les engagements de réduction tarifaire (lignes tarifaires au niveau du Système Harmonisé à six chiffres (SH6)) et, d'autre part, de prendre comme référence un scénario d'intégration régionale correspondant aux engagements bilatéraux du Vietnam.

Nos résultats montrent que les échanges de marchandises du Vietnam bénéficient de l'accession à l'OMC, principalement du fait de la levée des quotas textiles américains. Les gains de bien-être devraient représenter 1 % du produit intérieur brut à l'horizon 2015. Ces gains proviennent pour 39 % de la baisse des droits de douane et pour 61 % des nouveaux accès aux marchés pour le textile et l'habillement. Le succès futur du Vietnam apparaît cependant conditionné à la capacité du pays à diversifier suffisamment ses produits et ses marchés. De plus, nous faisons apparaître le rôle important du marché du travail, en pleine mutation dans ce pays (migration interne, accès à l'éducation).

Du points de vue méthodologique, le cas du Vietnam soulève des questions intéressantes. Sa croissance rapide résulte de profonds changements structurels qui rendent nécessaire une prise en compte précise du sentier de référence dynamique. Les hypothèses sur plusieurs autres aspects de la modélisation (marché de l'emploi, balance commerciale) et les dispositifs de politique commerciale pris en compte (exemption de droits de douanes sur les produits d'industries exportatrices) ont également un effet sensible sur les résultats. Il en ressort que les études portant sur ce type d'économie doivent accorder une attention particulière à ces différents points.

RESUME COURT

L'entrée du Vietnam à l'OMC le 11 janvier 2007 représente l'aboutissement d'années d'efforts déployés par cet Etat pour moderniser son économie. Nous proposons dans cette étude une évaluation en équilibre général des effets de cette adhésion. Cette analyse est menée au moyen d'un modèle de politique commerciale dynamique récursif prenant en compte les exemptions et les baisses de droits de douane au niveau fin de la nomenclature SH6. Une attention particulière est accordée à la sensibilité à certaines hypothèses sur le sentier dynamique, le marché du travail et la balance commerciale. Nos résultats montrent que le Vietnam devrait tirer bénéfice de ses engagements sur le commerce de marchandises. Les gains attendus sont cependant sensibles au rythme de développement du secteur du textile et de l'habillement, dont les exportations devraient être très stimulées par la suppression des quotas américains.

Classification JEL : D58, F13, F15.

Mots clés : modèle d'équilibre général, politique commerciale, organisations internationales, Vietnam.

Vietnam's Accession to the WTO: Ex-Post Evaluation in a Dynamic Perspective

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1 Introduction

Experiencing a tremendous growth in the steps of China, Vietnam is 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 of the country to the World Trade Organisation (WTO) on January 11, 2007. This process of accession, started in 1995, was a continuation of the radical economic reform initiated ten years earlier. As Vietnam success relies heavily on exports (representing more than 70% of the gross domestic product (GDP) in 2005), especially to developed countries, a positive impact is expected thanks to this new status. However, assessing more quantitatively the commitments effect remains a sensitive exercise: many computable general equilibrium (CGE) ex-ante evaluations led to diverging diagnoses, which fed the critics on the limitation of these tools for such analysis.

This paper intends to prolong the works on the issue of Vietnam's accession to WTO, using a quantitative assessment with CGE methodology (Roland-Holst et al., 2002; Dimaranan & McDougall, 2005; Nguyen & Ezaki, 2005). As far as we know, this study is the first to implement the final tariff commitments at the 6-digits level (HS6) of Harmonised System in a CGE framework and to take into account the alternative effect of regional integration in the assessment. Moreover, we will look at issues related to the high growth of Vietnam and see whether they constitute real constraints for the relevance of the analysis.

Vietnam committed for some changes on a large number of its tariffs and also promised to implement a set of other measures concerning technical barriers to trade, intellectual property, and liberalisation in services. The case of Vietnam and WTO is also particularly interesting because this country undergoes a strong growth with important structural changes, is highly dependent on trade and has been studied by several

teams of modellers. As WTO accession went past, it is now easier to review the different works and compare their results with what effectively occurred to the Vietnamese economy.

Our main focus will be the effect of WTO accession for Vietnam, mainly through the commitments signed in late 2006. The paper is organised as follows. In Section 2, after having briefly reminded the context of Vietnam's accession to WTO and the main challenges for this country related to trade policies, we delimit the WTO commitments that can quantitatively be assessed. Then, we conduct our own standard analysis of Vietnam accession using MIRAGE,[3] the CGE model from CEPII, with most commonly recognised modelling features. We compare our results with previous studies in Section 4 and review some criticisms made to the methodology. In Section 5, we compare these results to the observed trends and show how to improve the results from the previous section with a more precise baseline. In particular, a focus on some strategic sectors and a precise estimation of quantitative restrictions is crucial to understand the outcome of these negotiations. Last, we study in Section 6 some alternative assumptions on the labour market and on macroeconomic closure to test the sensitivity of our results.

2 VIETNAM TRADE POLICY AND WTO ACCESSION

2.1 Vietnam economic and trade history

After two decades of war, Vietnam entered in the end 70s a period of planned economy which aimed at rebuilding agricultural and industrial capacities. However, the rhythm of recovery of its economy was boosted by the "Doi Moi" inflexion of 1986, initiating prices liberalisation, a legal and institutional environment reform and the opening up of the country to the rest of the world through incentives for trade-oriented industries and foreign direct investments (FDI). Vietnam revealed quickly a strong support to economic integration, which was illustrated by two major initiatives in 1995: the entrance into the Association of Southeast Asian Nations (ASEAN) and the application for WTO membership.

The effects of the "Doi Moi" policy have been particularly visible over the last decades. 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%.[4] With a share of exports exceeding 70% of its GDP (see Figure 1), Vietnam succeeded to open up rapidly and to achieve at the same time considerable social progress. That is

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[3] MIRAGE stands for "Modelling International Relationships in Applied General Equilibrium".
[4] Source: World Development Indicators

why this country is frequently cited as an example for poverty reduction policies and development achievements.

Figure 1: Trade of Vietnam as a share of GDP

However, because of the difficulties encountered by South-East Asia in the late 90s, the trade wake-up of Vietnam is still recent. International trade has exploded over the last five years at a rate exceeding 17% a year following a model of industrial development quite similar to China's. Vietnam has specialised its exports on a few labour-intensive industrial sectors with high demand from developed economies, and valued its natural resources (oil, agricultural products) in a context of high prices. Understanding the role of WTO accession in this context of rapid development is a delicate task, considering all the different influences that drive Vietnam opening.

2.1.1 The take-off following trade liberalisation

When negotiations for accession were launched in 1995, Vietnam's tariffs were still high and restricted a significant part of trade. Some heterogeneity remains today in the level of protection across sectors (still 66% of applied duty on beverage and tobacco and 34% on motor vehicles in 2006).[5] However, the overall protection decreased significantly in the recent period from 19.0% in 1999 to 13.2% in 2006.

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[5] Source: World Integrated Trade Solution (WITS), United Nations Conference on Trade and Development. Trade weighted average on major partners are used from WITS data for these historical figures. However, the tariff structure used in section 3 for the assessment follows a methodology based on reference group weights, as applied in MAcMap database.

In connection with this evolution, Vietnam's trade experienced a very rapid growth with an average annual growth of 16.9% on import value between 2000 and 2005 and 19.6% on export.[6] However, as for most developing countries, the structure of these exchanges is very asymmetric in both the type of goods and the identity of its major trade partners (Figure 2).

Figure 2: Exports of Vietnam by destination

Imports are mainly sourced from regional producers, which emphasises the importance of trade agreements with neighbouring partners (Figure 3). ASEAN, China and Taiwan feed the domestic market with processed goods and industries with raw materials, whereas high quality products are delivered by South Korea and Japan. In particular, the country is dependent on refined petroleum products (18.1% of imports in 2005), plastics and chemical products (15.9%), metals and iron (11.8%), and textile raw materials for its exporting industry (4.4%).

This surge in imports needs has been compensated by an expansion of exports, helped by several devaluations of the Vietnam Dong and a policy of duty drawbacks. The major export commodity is crude oil (23% in 2005), which boosts export revenues thanks to the increase in the price of energy. However, Vietnam still depends on foreign refinery capacities and needs to import its refined oil. Several projects are

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[6] Trade data presented here come from CHELEM database, CEPII's harmonised database on global trade, relying mainly on COMTRADE.

Figure 3: Imports of Vietnam by origin
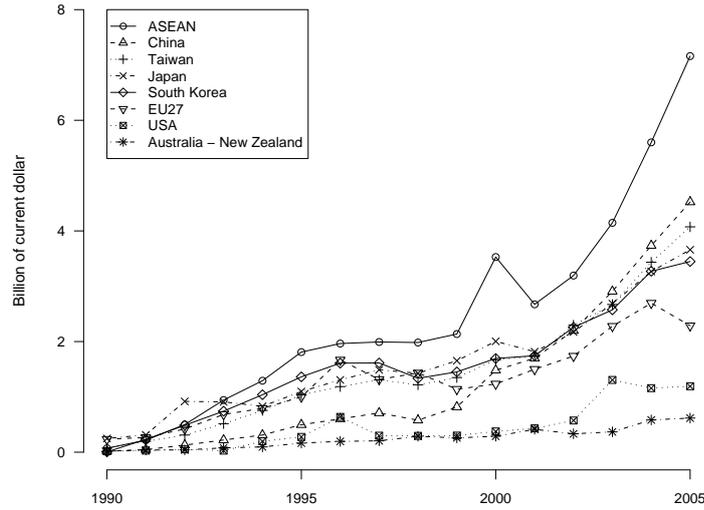
Source: CHELEM database 2007, CEPII.

aiming at getting out of this configuration but none has been completed to this date. Vietnam has fostered a specialisation strategy for exports with the development of a few labour-intensive industrial sectors that have revealed particularly effective. Main exports, besides oil (23% in 2005), are apparel (15.0%) and footwear (14.8%), which rely mainly on western markets' demand, in a context of high international competition. Other significant sectors are furniture (5.4%) and primary sectors: coffee and tea (4.1%), sea products (6.6%).
Looking at Herfindahl index,[7] Vietnam has a concentration of exports similar to some

Table 1: Normalised Herfindahl-Hirschmann index of exports concentration in 2005

	Vietnam	Cambodia	Japan	China	Thailand	USA
HS2	0.242	0.589	0.315	0.260	0.229	0.197
HS4	0.224	0.302	0.145	0.106	0.112	0.078
HS6	0.220	0.216	0.090	0.076	0.086	0.060

Source: BACI, Authors' calculations

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[7] We computed a normalised Herfindahl-Hirschmann, in 2005, using different nomenclatures for goods: hs2 (96 lines), hs4 (1241 lines) and hs6 (5113 lines) in the BACI database

of its closest neighbours such as China or Thailand (see Table 1). However, index values change with the different levels of aggregation. At the HS6 level (96 sectors), differences between China and Vietnam in terms of sectoral concentration appear larger and Vietnam shows as much dependency on a few lines as a less developed economy as Cambodia.

This dependency of Vietnam's exports on a few products makes the country particularly vulnerable to industry-specific cycles and tariffs. In particular, the quality of Vietnam's relations with a few major western economies is vital and conditions greatly the success of its export-oriented strategy.

A first illustration of this dependency is the effect of the recognition by the United States of America (USA) of Vietnam as a regular trade partner in 2001 through the US Bilateral Trade Agreement (US-BTA). Even if Vietnam remained under the "non-market economy" status, this decision changed drastically the pattern of trade between the two countries. This was particularly significant concerning Vietnam's exports of textile which exploded after 2001 when US tariffs on Vietnamese products went down from non-MFN (Most Favoured Nation) to the MFN regime: exports to North America jumped from \$80 million to \$2,340 million in only two years. However, exports of textile were still constrained under quotas and after the end of the Agreement on Textile and Clothes for WTO countries in 2005, Vietnam was one of the last countries exposed to this kind of restrictions.[8]

Concerning exports of shoes, Vietnam depends heavily on European Union (EU) markets absorbing \$3,103 million from the \$5,045 million exports in 2005. When imports in the EU were submitted to an anti-dumping policy in mid 2005, even if the new US opportunities allowed the Vietnamese shoes industries to find a substitution market, the growth rate of shoes exports was halved from 23.4% in 2003 and 2004 to 10.5% in 2005.

2.1.2 An active trade policy to consolidate the benefits of openness

In order to promote its exports, Vietnam has multiplied legal reforms and trade agreements during the last decades. After the implementation of HS compatible tariffs (instead of quotas), the creation of export zones and the introduction of duty exemptions on export industry's inputs (duty drawbacks), the country signed numerous agreements to obtain a better access to foreign markets. The first important sign of normalisation of trade relations was the agreement with the European Union in 1992, which was followed by the end of the US embargo in 1994 and the entrance in ASEAN in 1995. In 1999, Vietnam obtained from Japan access to the MFN status

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[8] A notable exception is the Memorandum of Understanding signed between the US and the European Union with China to agree on some delayed full access to their markets.

and in 2000, with the US-BTA, the same concession was obtained from the USA in exchange of partial tariff liberalisation and domestic reforms. The US-BTA was particularly important because it included several requirements based on WTO regulations, going even further on a few topics, such as regulation of services, and intellectual property dispositions (known as "WTO+" commitments).

As a consequence, the accession to WTO seems to be the final mark of a long-prepared process rather than the beginning of a new era. In 2000, Vietnam had already signed commitments with 129 countries to provide MFN access to its products, including 57 formalised trade agreements (Niimi et al., 2003). Major additional agreements followed the US-BTA, such as the ASEAN Free Trade Agreement in 2001, completed with a China-ASEAN and a Japan-ASEAN agreement in 2002 and 2003. An important agreement was finally signed in 2004 with the European Union to guarantee the support for WTO membership, which was obtained in late 2006 with the additional support of the USA.

2.2 WTO entrance commitments

Concessions required from applicants during WTO negotiations have shown more and more stringent over time. The issues addressed between Vietnam and its main trade partners and the final outcome of negotiations ultimately reflect the new nature of trade concerns.

Tariff barriers to trade: A large number of cuts were obtained after years of negotiations with a schedule of reduction planning a tariff decrease for 4,235 products among more than 10,000 HS8 lines till 2014, most of them being implemented by 2012.[9] Agricultural sectors remain protected with less than half of lines subject to cut with simple average bounds decreasing from 25.4% to 21.0% (Figure 4, left panel). Industrial products lines have more important tariff peak cuts and are lowered in average from 16.2% to 12.4% (Figure 4, right panel). All products covered by the Information Technology Agreement (ITA) are committed to enter duty-free by 2014.[10]

Quantitative restrictions: Vietnam was authorised to keep some of its quotas under the form of Tariff Rate Quotas but will have to expand the quota volume by 5% a year. This concerns only a few agricultural products such as salt, sugar, tobacco and bird eggs.

Domestic support and export subsidies: Agricultural subsidies are capped to their average observed values during the period 1999-2001 concerning domestic support

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[9] Except for a few products such as Vehicle and Vehicle parts with some commitments going as far as 2019.

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

Figure 4: WTO cuts on Vietnam tariff bounds linked to accession
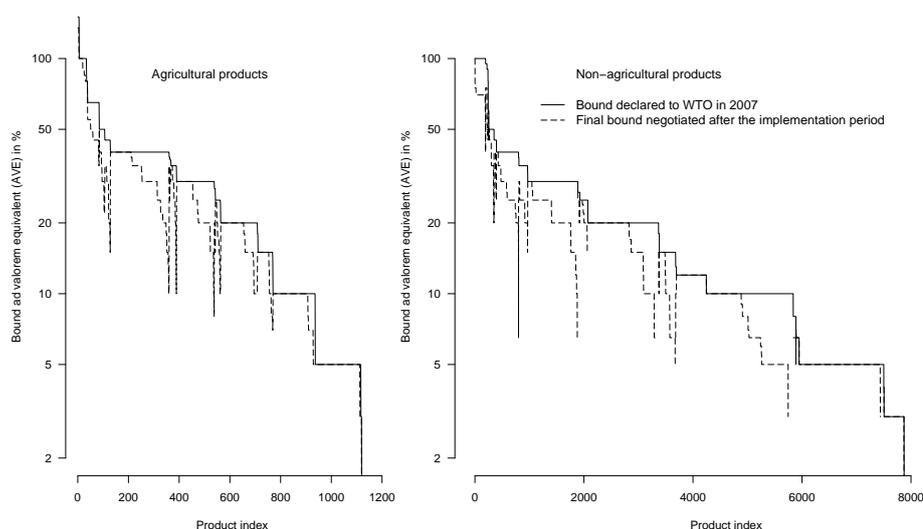
Note: Products are sorted at the tariff line level by decreasing order of *ad valorem* equivalent for 2007 bound value. Source: Authors' representation; data from the report of the Working Party on the Accession of Vietnam, WTO (2007).

(which represents around $246 million a year according to WTO). Export subsidies on agricultural products are banned whereas they represented an average of 1.2% for rice, 1.9% to 6% on pork products, 2.6% to 3.3% for canned vegetables and fruits and 1.5% on coffee exports for the 1999-2001 period.

Sanitary and Phyto-sanitary regulations: Vietnam government adopted a new law in 2006 in order to achieve implementation of standards for all food products. In November 2004, Vietnam had already declared that around 50% of its norms and standards for food products were compliant with international requirements (FAO-WTO, Codex Alimentarius, IPPC, OIE).[11] But some international standards remain unreachable in the short term and the country participates actively to regional and international organisations to establish standards and norm taking better into account its domestic constraints.

Legislation ruling industrial sectors: Vietnam is committed to go further on the way of opening up the capital of former state-owned enterprises (SOEs), whose value added still accounted for 38.4% of its GDP in 2005.[12] Except for firms of tobacco,

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[11] FAO: Food and Agriculture Organisation; IPPC: International Plant Protection Convention; OIE: World Organisation for Animal Health.

[12] Source: General Office of Statistics (GSO), Hanoi.

oil extraction and petroleum products, media and defence, a reform in legislation was initiated in 2004 (Decision No 155/2004/QD-TTg) to ensure capitalisation of most of SOEs. The Law on Investment of 2005 allows foreign investors to take participations into Vietnamese firms up to 30% of the capital. Non State-owned firms are subject to bankruptcy rules and cannot receive subsidies from the government when in financial difficulties. For exporting firms, duty drawbacks on imports remain but all subsidies with a coupled effect on export-oriented production have to be banned by Vietnam (supposed to be $12 million in 2004 as declared by Vietnam to WTO).

Anti-dumping policies: Vietnam is not considered by its major trade partners as a market economy. The USA and the EU are particularly concerned about discrimination between domestic firms and foreign firms and also the weak enforcement of certain conventions and treaties such as intellectual property rights conventions. As long as Vietnam has not shown its compliance to market economy standards in the importer regulation, importer countries can investigate anti-dumping cases in the framework of WTO regulations. This "non market economy" status can be invoked for a maximal duration of 12 years. Two famous anti-dumping cases were conducted during the last decade against Vietnam. The first opposed the USA to Vietnam concerning catfish exports in 2002, and the second was initiated by the European Union against exports of Vietnamese footwear in 2005. Both investigations concluded that Vietnam had "dumped" its sales through illegitimate subsidies and led to application of high duties as retorsion.

Trade-Related Investment Measures (TRIMs): Vietnam committed to eliminate some distorting measures aiming at guaranteeing local content for certain industries. However, a 80% mandatory ratio of exports was negotiated for certain categories of products, threatened by increased competition from foreign firms investing in Vietnam.

Trade-Related Aspects of Intellectual Property Rights (TRIPS): Vietnam has been part of the World Intellectual Property Organisation (WIPO) since 1976 and signed major treaties on intellectual properties in the years preceding accession: Bern convention in 2004, Geneva convention in 2005, Brussels convention and Madrid Agreement in 2006 and Roma convention in 2007. It implemented in its national regulations the requirements of these international conventions. However, difficulties of enforcement and level of penalties allow some doubt on the immediate efficiency of property rights protection.

Trade in services: In the framework of the ASEAN Free Trade Agreement (AFTA) negotiation, Vietnam had already committed to liberalise some of its services sectors, namely telecommunications, tourism, transportation and financial services. This consist mainly in allowing free installation of foreign firms in Vietnam for trading services. With WTO accession, the list has been slightly extended to some other businesses such as legal services, construction services, education and research services,

retail distribution services, environmental services and health services. However for each category, exchange from mode 3 (Commercial presence) remains restricted for a transitional period with limitation in the participation that foreign capital can obtain in domestic firms (30% in general, 49% to 51% for some specific sectors).

The concessions requested from Vietnam by other countries have been a debatable issue (Oxfam, 2004). Vietnam had to make more commitments than countries that accessed WTO earlier, especially on legal aspects and on services liberalisation. However, some arrangements were found for specific sectors. For instance, some tariff-rate quotas were implemented and protection was weakly reduced on certain categories of goods (agricultural goods and vehicles in particular).

In the following part, the effect of goods liberalisation will be assessed, taking in consideration quantitative commitments. We will mainly deal with tariff reduction, including ITA duty and textile quotas removal. We will not quantify other types of commitments, such as the effect of TRIPS, TRIMs and liberalisation in services, as no empirical methodology has proved robust enough to adress these issues quantitatively.

3 ASSESSMENT OF WTO ACCESSION UNDER STANDARD CGE ASSUMPTIONS

In this section, we aim at analysing the tariff effect of the commitment schedule signed by Vietnam for its accession to WTO and at comparing this impact to the overall opening up of Vietnam since 2001. In order to do so, we use a dynamic global CGE model with specific features for Vietnam.

We first present our data estimates for protection in the different scenarios assessed for this paper, built from the MAcMap-HS6 database at a fine level. Then, we introduce the model and results obtained from our central scenario, following standard assumptions. Last, we discuss the results building on observations such as Abbott et al. (2007).

3.1 Description of the trade policy scenarios used for WTO accession assessment

As mentionned above, efforts by Vietnam to open its economy began several years before applying for accession to WTO and the process of accession itself occurred simultaneously to numerous trade agreements or tariff schedule changes, more or less related to WTO requirements and doctrine. For example, ASEAN agreements with other regions such as China, Japan or the European Union can be explained better as a trend to reinforce regionalism rather than to favour a multilateral approach.

Moreover, as we rely on 2001 data for the Social Accounting Matrix (SAM) and tariffs, a large part of liberalisation had already occurred at the beginning of our period of reference. In 2001, 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. 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 original perspective allows us to dissociate the effect of WTO accession from the other integration benefits following Vietnam opening up, and to focus on the residual effect of WTO accession, after 2007.

3.1.1 Baseline scenario

Using a dynamic framework, we compare the baseline path of Vietnam's economy from 2001 to 2015 (no accession to WTO) with the scenario of WTO accession. The baseline of the model can be then adapted for the present exercise to the requirements of this single-country focus.

The total factor productivity (TFP) in Vietnam is assumed to go on with its very fast growth rate trend for all the period considered. This TFP is computed in the baseline 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% till 2010 and 8% on the 2010-2015 period.[13] For other regions, World Bank forecasts were used. Population growth projections were taken from UN forecast statistics and applied to the labour stock.

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. We 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

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

the 2001 year to adjust trade flows and the corresponding structure of the economy. Several trade policy agreements were then introduced in the baseline, assuming a progressive removal of tariffs for parties on the implementation periods :

- ASEAN Free Trade Agreement (AFTA) from 2001 to 2015.[14]

- Japan-ASEAN Free Trade Agreement from 2009 to 2015.[15]

- China-ASEAN Free Trade Agreement from 2004 to 2015.[16]

- ASEAN-Korea Free Trade Agreement.[17]

- US-Bilateral Trade Agreement in 2001.[18]

Some other major trade agreements under negotiation were not considered because of high uncertainty on their outcome. It is the case of the Doha Development Agenda, of the EU-ASEAN FTA, of AFTA-CER (ASEAN with Autralia and New-Zealand), and ASEAN-India.

For all the regions not included in FTAs, no changes were applied on 2001 tariffs in our baseline. As the reference situation corresponds to an assumption of Vietnam withdrawal from WTO negotiations, the evolution of tariffs from 2001 to 2007 is not

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[14] 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/afta.asp), classified in AHTN nomenclature (www.aseansec.org/15986.htm). We only take products that are considered as highly sensitive or the general exceptions.

[15] 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.

[16] 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.

[17] 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% category of highly sensitive products. On the ASEAN side, only sensitive products for the Vietnam were considered, like for the Japan-ASEAN FTA.

[18] 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/.

assumed for these regions to follow the historic path (significant cuts related to WTO negotiations) but to remain constant as an illustration of the *status quo*.

Tariff changes were computed for each year of the 2001-2015 period at the HS6 level thanks to the MAcMap-HS6 v1 database (5113 products) and aggregated with reference group methodology (5 reference groups in the world) in order to avoid aggregation bias.[19]

3.1.2   Simulation scenario

Building on the baseline scenario, the simulated path incorporates WTO accession commitments. As a consequence, all FTAs in the baseline are kept in the simulation. This means that the effect of WTO accession is assessed in a context where Vietnam already opens up considerably through regionalism. This aspect will be important to keep in mind when discussing the results. WTO commitments were taken into account in three ways:

- From 2001 to 2007, applied tariffs toward countries and regions not included into FTAs are decreased linearly, when they were higher, to their consolidated level reported by Vietnam in 2007. The underlying assumption is indeed that this decrease is the result of concessions made to other WTO members during the accession negotiations.

- From 2007 to 2015, Vietnam's applied tariffs, when higher, are lowered at the level of CTS commitments scheduled each year in the WTO accession document. The tariff level from the baseline is automatically kept when found lower than the new WTO bound. The commitments were introduced and processed at the HS6 level and aggregated with the same methodology as for the baseline.

- Our analysis of tariffs applied to Vietnam shows that all countries were already applying MFN tariffs to Vietnam in 2001. As a consequence, no change in tariffs applied to Vietnam's trade partners is considered here in the case of accession.

3.1.3   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

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[19] See Bouët et al. (2004) for a complete description of the database and the aggregation methodology.

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.

A delicate task for the scenario specifications was to consider what would have happened if Vietnam had stopped its accession to WTO. We supposed that if Vietnam had withdrawn from WTO negotiation in 2001, neither the European Union nor the USA would have removed these quotas. In order to introduce quantitative equivalents to these restrictions in the model, we used tax exports equivalents computed by Francois & Spinanger (2004). Following Dimaranan et al. (2005), we replaced the null values for the EU by an *ad valorem* equivalent (AVE) of 10% on textile and apparel products. We will comment on the modelling of the quotas phasing out in Section 5.

3.1.4 Description of changes in tariff structure

Because the baseline incorporates a significant number of trade agreements, Vietnam already undergoes a significant opening up with a decrease of its tariff going from an average trade-weighted aggregate of 19.6% in 2001 down to 11.3% in 2015 under

Figure 5: Protection structure of Vietnam by exporting region
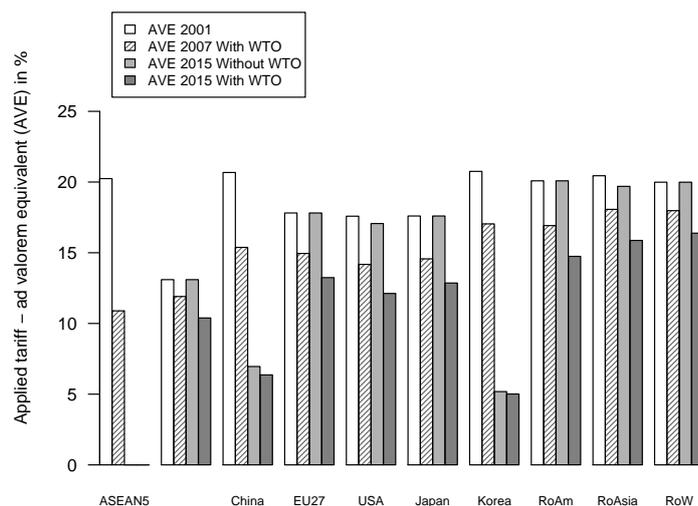
Source: MAcMap-HS6 v1, CEPII 2004; authors' calculations.

intra-ASEAN, ASEAN-China, ASEAN-Japan and ASEAN-Korea trade agreements. The simulation with WTO accession leads to an average protection of 5.3% in 2015 (see Figure 5). This decrease in tariff barriers is progressive in accordance with FTA or WTO commitments.[20]

The regional distribution of tariff reductions is a consequence of the assumptions made in the baseline and WTO scenario concerning regional integration and bilateral free trade agreements. ASEAN countries, China, Japan and Korea experience a decrease of their tariffs as a result of FTAs. The USA see their tariffs slightly decrease after the US-BTA cut on strategic products. Other countries do not experience cuts in the baseline except in the case of WTO accession.

Looking at 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 affected by this general opening movement. The impact of WTO commitments is more focused on a few sectors: rice and crops remain

Figure 6: Protection structure of Vietnam by sector
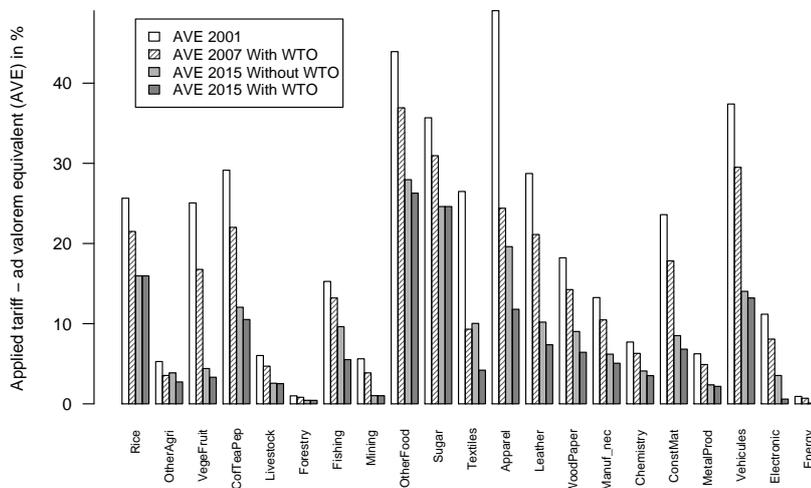
Source: MAcMap-HS6 v1, CEPII 2004; authors' calculations.

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[20] Weights come from BACI (from CEPII) trade flows in 2001 aggregated in five reference groups of countries for the aggregation from the HS6 level to the GTAP level; GTAP trade flow 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%, 7.7% and 5.3% respectively.

almost at the same level of protection, whereas meat, fruits and vegetables undergo a more significant opening when comparing baseline and WTO scenario (see Figure 6). On the manufactured products side, textile and apparel, as well as leather are more strongly exposed under the WTO scenario. However, major parts of intermediate products used by these sectors are already exempted of duties, through a mechanism of duty drawbacks for exporting firms (see Dimaranan et al., 2005, for a more detailed description). The electronic sector undergoes also a liberalisation linked with the implementation of the Information Technology Agreement (ITA) by Vietnam.

As stated before, tariffs faced by Vietnam did not change significantly after its WTO accession. The USA was the last WTO member not applying MFN tariffs in 2000 to Vietnam. As a consequence, exports in this study will be mainly affected through the modelling of the end of quotas on Textile and Apparel sectors. European Union's quotas are considered to be removed in 2004 and the US quotas in 2007 if Vietnam enters WTO.

3.2   Model features

In order to assess the effect of WTO accession, we worked with an adapted version of the MIRAGE model, a multi-region multi-sector CGE developed at CEPII for trade policy analysis. This model relies on the GTAP database; it can be run in a dynamic recursive mode and incorporates optional features such as quality differentiation for goods, foreign investment modelling, imperfect competition (Decreux & Valin, 2007).

The GTAP database includes in its 6.2 version a Social Accounting Matrix 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. Some data on the GTAP SAM were however adjusted in the current study to best reflect the present context: for the three major exporting sectors in manufacture, we fine-tuned the value-added intensity in production of Vietnamese sectors thanks to data obtained from United Nations Industrial Development Organisation (UNIDO).[21]

GTAP sectors and regions aggregation were specifically chosen to represent adequately the structure of Vietnam sectors and major trade partners. Eleven regions were represented: Vietnam, ASEAN5, Australia/New-Zealand, China, EU27, USA, Japan, Korea, Rest of America, Rest of Asia, Rest of the World. GTAP sectors were aggregated in 26 activities, in which 8 for agriculture and primary sectors, 12 for

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

industries and 6 for services ones (see tables 14 and 15 in appendix A for details). Considering the specificities of Vietnam, the model was run with some particular features.

3.2.1   *Dual production for duty drawbacks*

Like China, Vietnam applies duty-drawbacks and vietnamese exporters can be reimbursed by the government for duty taxes paid on their intermediate goods. That is why we developed a specific version of the model following the methodology introduced in the GTAP framework by Ianchovichina (2004) and first applied to Vietnam by Dimaranan et al. (2005). Production sectors of Vietnam were distinguished between exporting sectors and domestic production sectors (see Table 2). Factors were allocated proportionally to the output of the two categories of sectors, which means that sectors were initially calibrated from the same structure. Demand for goods was also split in two markets: a first market for final consumption goods, intermediate goods and capital goods used by local consumption producers; a second market for intermediate and capital goods used by the export industry (see Figure 7). Last, a duty drawback "shock" was applied to imported goods and capital consumed by exporting industries by setting tariffs to zero on these kind of goods in the pre-experiment simulation. Assuming they correspond to the share of production between domestic-

Table 2: Proportion of exporting firms in production and Vietnam's exports in 2001

Sectors	Export share in production	*Exports (mio $)*	Sectors	Export share in production	*Exports (mio $)*
Rice	6.0%	*384*	WoodPaper	34.7%	*659*
OtherAgri	12.5%	*41*	Manuf nec	68.9%	*1,304*
VegeFruit	14.0%	*257*	Chemistry	17.8%	*516*
CofTeaPep	92.6%	*755*	ConMateri	8.2%	*223*
Livestock	3.7%	*68*	MetalProd	9.0%	*164*
Forestry	1.4%	*8*	Vehicules	7.4%	*126*
Fishing	3.4%	*52*	Electronic	87.6%	*544*
Mining	78.1%	*2,262*	ElecGas	0.1%	*2*
OtherFood	33.5%	*1,518*	BusServ	15.6%	*761*
Sugar	3.4%	*13*	Construct	0.8%	*71*
Textiles	36.0%	*555*	Trade	3.5%	*138*
Apparel	82.2%	*1,697*	Transport	51.4%	*705*
Leather	67.1%	*2,990*	PubServ	5.4%	*259*
			Total	23.6%	16,072

Source: GTAP database and authors' calculations

oriented and export-oriented firms, 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, one can expect a larger share of foreign intermediate consumption to be consumed by exporting firms.

Figure 7: Production process with and without duty drawbacks
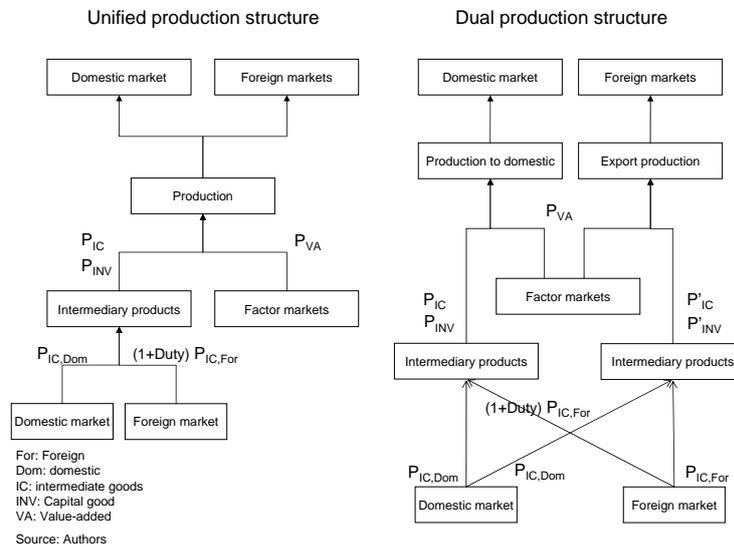
3.2.2 Labour market

In our central scenario, 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 Mensbrugghe, 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 were modelled with an 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 recruitment of rural workers, without any price tension on the urban labour market.[22] 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 demand shock by industrial sectors. This feature was inserted in our modelling in the following regions: China, Vietnam, ASEAN5, RoAsia, AfricaME. Labour supply in the baseline was 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, we changed the labour force, expressed in wage volume in GTAP, into a volume in number of workers to apply the Constant Elasticity of Transformation function (CET) or the migration effect. For developed countries, we use a CET function. We will discuss the role of this assumption in section 6.2.

3.2.3 Other specifications

Intermediate consumption: Rigidity was introduced between energy and non-energy intermediate consumption in order to model the specific dependency of international demand to energetic goods.[23] This change appeared particularly important in the present modelling in order to reproduce the increasing share of crude oil in the value of Vietnamese exports.
Competition regime: Although MIRAGE allows different competition regimes, considering the lack of data on the number of firms by sector and precise information concerning market power of Vietnamese firms on domestic and foreign markets, we set the modelling to a perfect competition regime.

4 WTO ACCESSION: CENTRAL SCENARIO RESULTS

4.1 Macroeconomic effects

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").

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[22] 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

[23] 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.

Indeed, the country should improve its welfare by +0.9% in 2015 through the new tariff schedule and the end of quotas, which represents a gain of $598 million (Table 3).[24]

Table 3: WTO accession: main aggregate results for the central scenario and FTA assessment

Variation in 2015	Central scenario: WTO with end of quotas	WTO without end of quotas	WTO and FTAs
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	1.0%	-0.2%	-2.7%
Real wages unskilled	1.6%	0.4%	4.5%
Real wages skilled	1.8%	0.9%	7.8%
Capital return	6.4%	0.6%	12.3%
Foreign direct investment	4.7%	1.0%	16.3%
Welfare	0.9%	0.4%	1.5%

Source: Authors' calculations with MIRAGE

Following Dimaranan et al. approach, we decompose the results to look at the effect of quota phasing out. The end of quotas accounts for 61% of total gains: modelling the same effect without taking into account quotas removal leads to gains of only +0.4% in 2015.

These gains can be compared to those obtained with the cumulative effect of WTO agreement and regional trade agreement.[25] In this alternative scenario, we find that GDP gains are +3.7% while total welfare gains represent +1.5% with the cumulative impacts of all openness policies.

Considering that the end of quotas plays a significant role in Vietnamese exports burst, it is no surprise that the US and the EU make a large benefit from this accession ($1,178 million and $271 million respectively), with the decrease of apparel prices on their domestic market (see Figure 8). China losses (-$710 million) symmetrically reflect the loss of market share linked to this new opportunity offered to Vietnam textile. ASEAN5 losses (-$196 million) can be explained by the decreased

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[24] Values in this part are expressed in 2001 US dollars.

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

Figure 8: Distribution of gains between countries
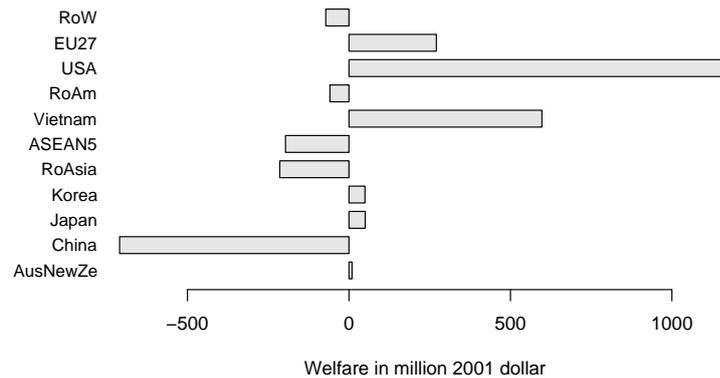
Source: Authors' calculations with MIRAGE.

importance of the regional AFTA in a more multilaterally opened world.

When looking at the distribution of results across sectors (Table 4, the end of quotas effect is very clear on textile and apparel industries. Variations obtained are large, even if they remain modest when compared to the very fast growth that these sectors experience on the overall period. However, this does not take into account the new monitoring programs set up by the US trade authorities in order to indirectly keep some control on the volume of textile imported from Vietnam. Estimates of quotas used here are discussed in Section 5.

Effects on all other exports are negative. This point seems to be particularly debatable. However, domestic production increases for some of these sectors (for example construction or trade), thanks to an increase of demand. But exports expand less, 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 a lot of sectors experience an increase in their exports under the WTO accession. This important effect related to quotas modelling is due to the macroeconomic closure of the model, which follows the standard assumption that trade balance remains constant due to long run exchange rate adjustments. We will come back to this assumption in Section 6.

Another interesting fact appears at the macroeconomic level. On the import side, the effect of WTO accession is an increase in final demand (+5.8% in 2015), following price decrease. But on the export side, the demand is mainly focused on textile and leather with the end of quotas, as all intermediate consumptions are already exempted from duties and MFN tariffs are already applied to Vietnam's exports. As a consequence, Vietnamese exports rise only in a few sectors but in a very large

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Table 4: Main results on export and output in central scenario

| 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

proportion. The rapid expansion of these competitive industrial sectors is also sped up by the hypothesis of fixed wage for unskilled labour, which assumes an unconstrained supply of workers. The magnitude of growth is then mainly set up through the dynamics of capital and skilled labour. Hence, prices decrease slightly on foreign markets for apparel and textile, especially because quota rents are removed for Vietnamese exporters who reduce their prices to the US and the EU markets. This creates a decrease in terms of trade which negatively impacts welfare expansion (-1.35% in 2015). To put it in a nutshell, although the end of quotas related to WTO accession favours growth by encouraging the specialisation of Vietnam into a few labour intensive sectors, benefits of this accession could be limited because of the price decrease for Vietnamese exports on some foreign markets. We come back to this question in Section 5.

The WTO scenario leads to a rise of employment in industry by 5.2% in 2015, driven by the expansion of major exporting sectors. The creation of activity increases the average wage of unskilled labour by 1.6%, mainly thanks to the hiring of new workers in 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. Skilled workers experience a 1.8% increase of their real wages, mainly explained by the tension induced by needs of the expanding industry. As we already considered an increase in skilled labour resource in the model, this increase in wages suggests that the supply growth estimated could not be enough for responding to the fast development requirements.

4.2   The effect of duty drawbacks

As explained by Ianchovichina (2004), the modelling of duty drawbacks changes the magnitude of results. On China, Ianchovichina finds that omitting duty drawbacks can lead to overestimate gains from tariff cuts by 15%. On Vietnam, Dimaranan et al. find a figure over 70%. However, our modelling implies that taking into account duty drawbacks reduces Vietnam estimated gains by a ratio closer to 10% in the case with quota phasing out (closer to 22% otherwise). This ratio in fact highly depends on the structure of exporting sectors that is determined by the calibration in the preexperiment. Ianchovichina and Dimaranan et al. double the elasticity of substitution for intermediate consumption in their initial shock, for the calibration. In our approach, we choose not to change this elasticity because of lack of data to determine the final share of imported goods in each category of industry. As a consequence, removing duty drawbacks in the preexperiment maintains a higher share of domestic input for exporting firms than in previous studies because we assume the same substitution

as in the general model. In fact, data for this share of domestic inputs is not available in GTAP database (sectors are not distinguished between exporting sector and domestic oriented sector). This limitation adds the constraint that intermediate and final consumption goods are mixed in trade flows, making it not possible to distinguish differences of origin neither in intermediate consumption products nor in final consumption ones. Table 5 shows the share of imported goods used for exports and exempted of duty, before the preexperiment (no shift of consumption from exporting firms) and after the preexperiment (taking into account preference of exporting firms for imported inputs).

Table 5: Proportion of imports for each good used as intermediate product by exporting firms

Good	Without DD	With DD	Good	Without DD	With DD
Rice	9.1%	10.9%	WoodPaper	16.6%	24.5%
OtherAgri	9.7%	10.6%	Manuf nec	18.8%	23.5%
VegeFruit	8.6%	12.8%	Chemistry	17.7%	21.2%
CofTeaPep	38.6%	53.6%	ConMateri	7.3%	12.5%
Livestock	9.2%	9.3%	MetalProd	17.4%	21.5%
Forestry	24.8%	25.0%	Vehicules	11.8%	25.7%
Fishing	13.1%	12.5%	Electronic	33.8%	40.6%
Mining	15.5%	21.9%	ElecGas	11.8%	11.8%
OtherFood	6.5%	12.5%	BusServ	12.4%	12.4%
Sugar	6.4%	14.3%	Construct	19.3%	27.8%
Textiles	46.9%	63.0%	Trade	21.8%	22.6%
Apparel	25.1%	50.7%	Transport	10.8%	11.1%
Leather	48.5%	71.1%	PubServ	1.2%	1.1%
DD = duty drawbacks			Total	17.7%	23.7%

Note: Size of export sector is computed for each sector as the proportion of export in the total domestic production. Share of imports in inputs is the proportion of imported intermediary products relatively to the total intermediary products consumed by the exporting sector. Share of imports reexported designates the proportion of imports that are used as intermediary products.
Source: Authors' calculations

4.3   What can be inferred from these results?

These results, obtained with a standard CGE methodology, raise various questions. Indeed, as developed in Section 2, Vietnam has experienced a very high growth during the last decade and yet, the contribution of tariff decrease to this growth seems to be very small according to CGE models. We have just shown that the estimated

welfare gains for Vietnam were around +1.5% from 2001 to 2015 when taking into account regional FTA and WTO effects. Should we assume Vietnam medium growth rate is 7% on the period, the 0.9% gain from accession represents +2.2% of 2001 GDP and should be compared to the 258% overall increase over the period... How can this difference be explained and what can be improved?

This question has already been addressed in the literature. Several points participate to the answer. First, we only look here at one contribution to growth, at a time when the role of trade openness related to other factors such as rule of law, democracy and reforms is more and more invoked to explain some success stories of development (see for example the multiple contributions in Aghion & Durlauf, 2005). Even some more direct factors related to WTO commitments such as non-tariff barriers (except textile quotas), barriers to services, and qualitative agreements with consequences on FDI and technology transfers are not studied in this work, because no satisfying methodology has made consensus.

The gains obtained in our study look however quite consistent with those obtained in similar recent studies. Abbott et al. (2007) reviewed seven CGE papers focusing on Vietnam accession to WTO. They showed that most of them anticipated a positive effect of Vietnam accession, although they assumed different modelling assumptions. A few more studies have been completed more recently (Fujii & Roland-Holst, 2007; Cling et al., 2008) and confirmed these trends. We report the gains reviewed in Abbott et al. and updated by DIAL in Table 6.

Abbott et al. provide many details on the mechanisms that CGE models can hardly reproduce, either because of theoretical foundations (static framework, constant elasticity of transformation functions (CES), Armington elasticity, labour market assumptions), either because of the absence of consistent quantitative estimates (dynamic gains, effect of FDI, extensive margin of trade...). Taylor & Von Arnim (2006) also report the macroeconomic closure assumptions as an important determinant for results.

We propose in the next section to focus on the dynamics of Vietnam's trade to see how an alternative modelling can change the results obtained in the previous scenario. We will first look at the role of exports in growth and second refine the effect of WTO accession on the textile and apparel sector.

5 CONFRONTING THE DYNAMIC OF VIETNAM TRADE

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. Moreover, trade expanded even more quickly than growth: there was an average rise of 16.9% per year in im-

Table 6: Review of past studies in CGE on trade agreements for Vietnam

Name	Nb of scen.	GDP (Welf) Min	Max	Exports Min	Max	Imports Min	Max	Model characteristics	Baseline	Scenarios
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; Sensitivity analysis: +/- 50% on elasticities
Fukase and Martin (2001)	5	-4.7	1	3.9	15.2	3.1	12.8	GTAP static	Modified GTAP4 database	
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	-0.1	-0.7	1.7	18.2	3.1	15.4	Static multiregion, dual labour market, exogenous wages for formal sector	GTAP6	3 Regional FTAs; Regional FTA + Bilateral FTA Japan + US; Multilateral liberalisation
Dimaranan et al. (2005)	2	6.7	7.9	15.2	18.8	NA	NA	GTAP static, ATC, multiregion, duty-drawbacks	GTAP6, end of EU quota, IC rebalancing	WTO accession schedule; +33% Deeper liberalisation
Huong 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	-0.3	5.3	-0.8	20.5	-1.3	27.5	GTAP static linked to a micro simulation model	GTAP6	-100% Vietnam; -100% Vietnam + Improved market access; Partial opening Vietnam;

Source: Adapted from Abbott et al. (2007). Update from Cling et al. (2008) and completed by authors.

port value between 2000 and 2005 and 19.6% in export one. On this point, standard dynamic assumptions are not satisfactory. The model assumes a growth rate of 8% 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, they do obviously not enough to explain historic 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 constraining in a CGE approach (as long as one relies on Armington rules for explaining cross flows at the aggregated level), we use sectoral TFPs in our dual production structure to adjust the dynamic path.

5.1   Better reproducing structural changes in the baseline

In our central scenario, growth is computed exogenously for Vietnam. We use GDP projections from the World Bank for all regions, except for Vietnam for which we assume a high growth scenario of 8% till 2015 in the baseline.[26] GDP growth is converted into a homogenous TFP variation applied to the 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 fact, 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 the model through a standard accumulation of capital and reallocation of labour. Moreover, the International Monetary Fund (IMF) statistics show significant variation in labour productivity across main sectors (agriculture, industry services) and we can anticipate a lot more heterogeneity between industrial sectors.

In order to test the effect of this first bias and to better represent structural changes, we introduced in the model a sector-specific TFP. For domestic sectors, we used an exogenous differentiated TFP whereas for exporting sectors we computed the specific values of TFP growth allowing to match exports in the baseline. This was done while keeping as a global constraint the exogenous GDP forecast. This means the historical GDP is still respected through a global TFP equal for all sectors.

Because no growth rate was available by sector, 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

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[26] Of course, this growth also takes into account the past and anticipated effect of WTO accession in the official statistics. However, as we showed before, GDP gains from CGE are small in comparison with dynamic growth and applying the observed and predicted growth to the baseline ("Vietnam without WTO") is therefore consistent.

Table 7: Differentiated TFPs introduced in the model

	Observed annual growth		TFP differential for modelling		
	Value added	Exports	TFP domestic	TFP export 1	TFP export 2
Rice	1.9%	27.0%	4.2%	4.2%	4.2%
OtherAgri	5.5%	6.1%	4.2%	4.2%	4.2%
VegeFruit	4.4%	22.0%	4.2%	4.2%	4.2%
CofTeaPep	5.5%	20.9%	4.2%	4.2%	4.2%
Livestock	7.2%	6.0%	4.2%	4.2%	4.2%
Forestry	0.9%	23.3%	4.2%	4.2%	4.2%
Fishing	8.6%	-9.3%	4.2%	4.2%	4.2%
Mining	4.4%	21.6%	3.8%	12.6%	14.5%
OtherFood	15.4%	15.8%	3.8%	26.3%	35.6%
Sugar	na	-43.2%	3.8%	3.8%	3.8%
Textiles	15.9%	30.7%	3.8%	27.6%	12.4%
Apparel	22.6%	27.9%	3.8%	12.5%	3.8%
Leather	18.9%	17.4%	3.8%	14.3%	16.9%
WoodPaper	20.3%	34.6%	3.8%	3.8%	3.8%
Chemistry	18.1%	31.8%	3.8%	25.4%	29.3%
ConstMat	12.6%	22.0%	3.8%	8.6%	11.3%
MetalProd	23.1%	40.1%	3.8%	43.6%	43.6%
Vehicules	22.4%	27.5%	3.8%	26.3%	29.6%
Electronic	19.6%	30.0%	3.8%	34.3%	39.0%
Manuf nec	21.7%	23.1%	3.8%	10.3%	13.0%
Energy	14.3%	17.0%	3.8%	3.8%	3.8%
Construct	10.4%		-1.8%	-1.8%	-1.8%
Trade	8.3%		2.4%	2.4%	2.4%
Transport	8.3%		2.4%	2.4%	2.4%
BusServ	7.6%		2.4%	2.4%	2.4%
PubServ	7.6%		2.4%	2.4%	2.4%

Notes: Value added growth from IMF (2007) average on the period 2002-2006. For agricultural products, production is used instead of value added. Exports growth is averaged on the period 2001-2006 from CHELEM database (CEPII).

TFP export 1 is used for the baseline with differentiated TFP. TFP export 2 is used for the baseline with differentiated TFP and textile and garments sector improvement.

Source: IMF, CHELEM and authors calculations

2001-2006 period that labour productivity had grown 4.2% annually in agriculture, 3.8% in industry, -1.8% in construction and 2.4% for services. We introduced this differentiation in the model as shown in Table 7.

For export-oriented industries, we introduced 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.[27]

Considering the findings from the new trade literature showing that exporting firms are more competitive than domestic oriented firms (Melitz, 2003; Baldwin & Forslid, 2006), it appeared consistent to assume high TFP growth for the case of Vietnam exporting firms, especially considering that the government strongly supported investment in export oriented industries. Some very high values of sectoral TFPs probably did not only reflect changes linked to technology but also evolutions in the structure of the production process (for example, segmentation of the value-added chain). For these sectors, the increase in TFP led to significant increase in volume of value-added in the model; but the price of value added is then dropping, and as a consequence, overall value-added (in value) finally varies little (intermediate consumption and value-added are linked through a Leontieff function). Using this mechanism allowed to boost production and intermediate input consumption for fast growing exporting sectors. This typically reflects what happens when there is a segmentation of production and intra-sector trade increase.

Another explanation for trade increase comes from the role of extensive margins with trade of new varieties. This probably plays a role as well for Vietnam but not as large

Table 8: Increase in exports and number of varieties for Vietnam

	1999	2000	2001	2002	2003	2004	2005
Exports in Agriculture ($ mio)	1,923	1,600	1,462	1,471	1,870	2,447	3,011
(number of hs6 lines)	*339*	*362*	*368*	*377*	*387*	*407*	*411*
% change in number of hs6 lines	*6.6%*	*6.8%*	*1.7%*	*2.4%*	*2.7%*	*5.2%*	*1.0%*
Exports in Industry ($ mio)	8,285	11,397	11,927	13,983	18,952	24,227	29,078
(number of hs6 lines)	*2237*	*2521*	*2575*	*2700*	*2863*	*2973*	*3065*
% change in number of hs6 lines	*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
(number of hs6 lines)	*2576*	*2883*	*2943*	*3077*	*3250*	*3380*	*3476*
% change in number of hs6 lines	*4.2%*	*11.9%*	*2.1%*	*4.6%*	*5.6%*	*4.0%*	*2.8%*

Source: BACI, Author's calculations, trade flows in millions of US dollars

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[27] Assuming a log-linear growth did not appear credible because the fast increase in certain productions such as garments, leather or furniture was not sustainable at this growth rate. This reflects probably that log-linear increase does not take into account the catch-up effect following the fast technological progress.

as one could expect, as illustrated by a detailed analysis at the HS6 line level (see Table 8).

This improved baseline allows us to better reproduce the opening of Vietnam's economy by fitting more closely the intensification of trade. Figure 9 shows the difference obtained in the increase of the export to GDP ratio between the two baselines.

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 billions in 2015. With the new assumptions of heterogeneous productivity growth, we obtain in the baseline $8.2 billions in 2010 and almost $15 billions 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% in 2015, the increased expansion of textile leads to a net loss of -0.4% through a deterioration in terms of trade (-1.9%). This change in results shows the sensitivity of the results to the modelling of the textile and apparel sector, and its quantitative trade restriction measurement. That is why we propose in the next section to refine this projection and improve the results by a more detailed focus on the textile and apparel exports.

Figure 9: Exports as share of GDP in the different baselines
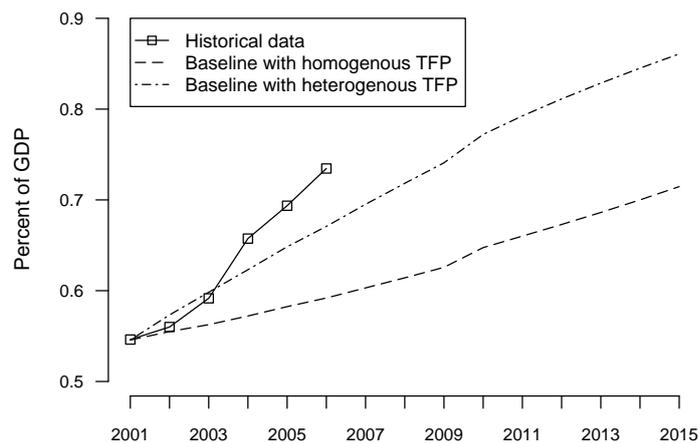
Source: Historic data from World Develoment Indicators, 2008; Authors' calculations for model baseline.

5.2 A focus on textile and garment exports

The previous simulations illustrate how the success of Vietnam's future trade policies 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, far earlier than was planned in the 2006-2010 Development Plan ($7 billion in 2008 and $10 billion in 2010), which would make textile and garment exports the first source of trade revenues.

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

However, the overestimation by the model of Vietnamese exports surge 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 more constrained in 2001 than the single tariff barrier taken from Fukase & Martin (2000) would suggest because export value in 2007 is not large enough. Second, the critical value of quota AVE used in the modelling so far and taken from Francois & Spinanger (2004) is probably too large.[28] In order to correct the first bias, we assume in a new simulation an additional non tariff barrier (NTB) related to the ante-USBTA period and set it to the same value as for 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 between 2006 and 2008. By reducing the export tax equivalent by 40%, we obtain in the model a rise for Vietnam exports to the US of 35% for garments.

We run the model with these new values, in order to see the influence of the new estimates on the results. This second improved baseline show weaker effects of WTO accession on exports of textile and garment (see Figure 10).

The nature of the results raises two questions. First, we wonder whether there is a risk of terms of trade as suggested by the surge in textile and garment following

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[28] 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 of their regression

Figure 10: Evolution of apparel exports following three different dynamic specifications
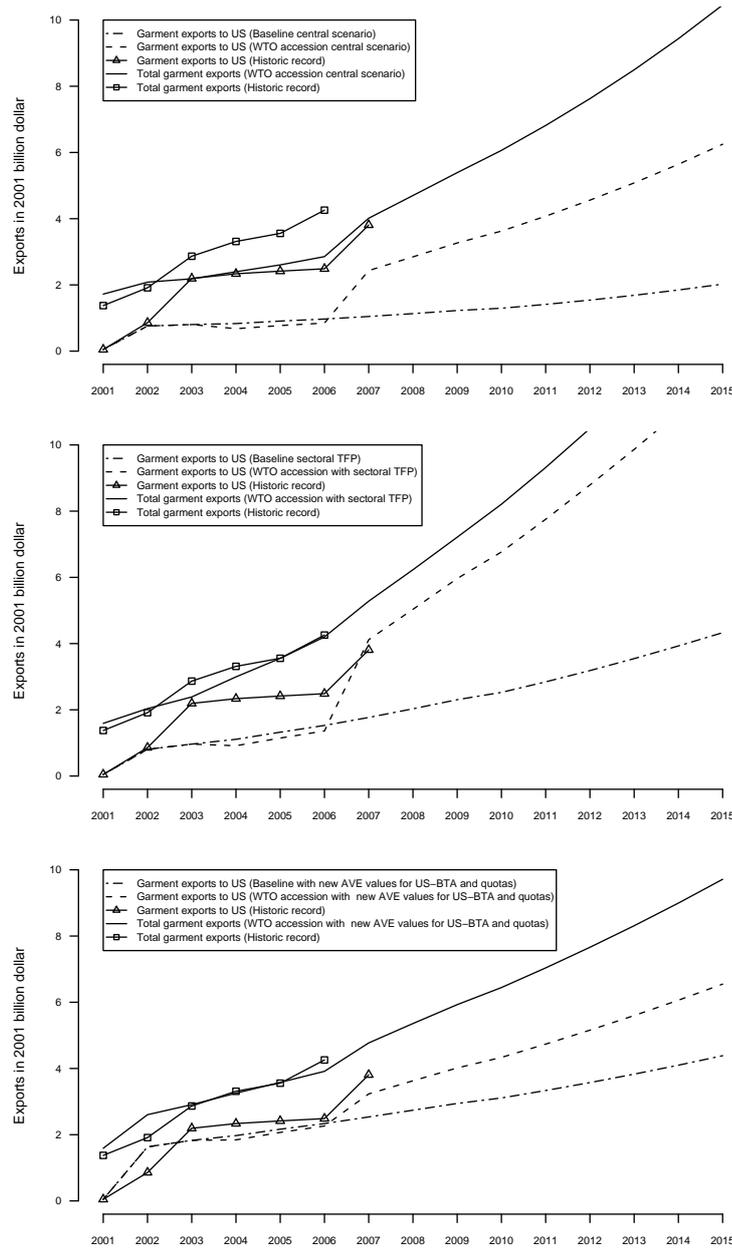
Source: Authors' calculations with MIRAGE

WTO accession. Using the BACI database,[29] we find no clear evidence that there is an overall decrease in prices of textile-garment when compared with prices of all exports on the Vietnamese side: we find for garment a decrease of 8% on the 1996-2001 period but a 5% increase on the 2001-2004 period; price of textile exports however decrease by 14% over the eight-year period. But import prices of textile and garment show a significant decrease for US over the period: -15% for textile and -8% for garment. Even though we could not use the post 2004 data, this suggests that the improved access to the US market could lead to a drop in Vietnamese export prices following WTO accession.

The second question is related to the distribution of gains and losses following the larger market access for Vietnamese textile and clothes. Due to the aggregation bias, China is shown as the losing competitor of Vietnam in case of WTO accession. Indeed, market shares of China and Vietnam on the US market both increase during the recent period, as explained by Chaponnière et al. (2007). Table 9 however shows that Vietnam market shares remain modest on the different markets at an aggregated level.

Table 9: Market shares of Vietnam and China for textile and wearing apparel in main destination markets (2005)

Importing Country	Wearing Apparel			Textile		
	Vietnam	China	*World (mio $)*	Vietnam	China	*World (mio $)*
USA	4.3%	23.6%	*55,136*	1.4%	22.6%	*40,363*
Japan	3.6%	78.0%	*15,262*	1.6%	69.8%	*11,739*
Mexico	2.0%	6.0%	*1,819*	0.2%	8.0%	*6,267*
Canada	1.8%	47.5%	*4,537*	0.3%	20.7%	*5,473*
Korea	1.7%	74.4%	*2,416*	2.1%	49.2%	*4,342*
ASEAN	1.2%	31.2%	*2,311*	0.8%	26.5%	*9,514*
EU27	1.0%	22.9%	*86,161*	0.2%	10.2%	*97,960*
Australia	0.9%	74.0%	*2,388*	0.5%	43.6%	*2,507*

Source: BACI (2007)

At a more detailed sectoral level, although China remains by far the largest exporter for most HS6 lines, the market share of Vietnam can be significant. 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 10). The four largest HS6 exports

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[29] 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 the CEPII website .

Table 10: US markets shares of some countries for 20 largest HS6 export volume of wearing apparel from Vietnam (2005)

HS6 Code	Description	VNM	BGD	CHN	IDN	IND	THA	TUR	MAR	TUN	US import (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%	0.1%	0.1%	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%	0.0%	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%	0.1%	0.2%	5,099	0.35
620520	Men's shirts of cotton	4.1%	12.6%	7.2%	8.8%	10.9%	1.6%	2.6%	0.0%	0.2%	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%	0.0%	0.0%	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%	0.0%	0.0%	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%	0.1%	0.0%	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%	0.0%	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%	0.0%	0.0%	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%	0.0%	0.0%	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%	0.0%	0.1%	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%	0.0%	0.0%	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%	0.0%	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%	0.1%	0.2%	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%	0.1%	0.0%	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%	0.1%	0.0%	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%	0.1%	0.1%	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%	0.0%	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%	0.0%	0.1%	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%	0.0%	0.0%	181	0.49

Note: VNM = Vietnam, BGD = Bangladesh, CHN = China, IDN = Indonesia, IND = India, THA = Thailand, TUR = Turkey, MAR = Morocco TUN = Tunisia

Source: BACI (2007) and authors' calculations

from Vietnam are present on this market with shares in volume exceeding a third of China's. Moreover, Vietnam's volume of exports to the US is larger than China's for four products, which illustrates that competition is intense on a few market segments. For these products, other exporters also have significant market shares and can be as serious competitors as China.[30]

Describing more precisely the dynamics of some sectors can therefore influence dramatically the outcome of trade policy assessments. In the case of Vietnam, it modifies significantly results (see Table 11): welfare gains vary slightly (+1% instead of +0.9% in the central scenario) but effects on growth appear more remarkable (+0.9% instead of +2.4%). This illustrates the importance of focusing on historical trends to better reproduce the sectoral dynamics in this type of assessment.

Table 11: WTO accession: Results with dynamic baseline improvements

Variation in 2015	Central scenario (with quotas)	Sectoral TFPs	Sectoral TFPs and new AVEs for quotas
GDP	2.4%	1.6%	1.3%
Exports (value)	8.4%	10.7%	3.9%
Imports (value)	7.0%	10.5%	4.1%
Terms of trade	-1.4%	-1.9%	-0.6%
Real effective exchange rate	1.0%	1.5%	0.8%
Real wages unskilled	1.6%	1.7%	1.3%
Real wages skilled	1.8%	0.5%	1.5%
Capital return	6.4%	8.9%	4.3%
Foreign direct investment	4.7%	5.6%	3.2%
Welfare	0.9%	-0.4%	1.0%

Source: Author's calculations with MIRAGE

In this last section, we additionally look at the sensitivity of the results to two assumptions. First, we study what would change if there was no exchange rate adjustment in the short term for Vietnam. Second, we look at the role of the specification we made for the labour market.

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[30] All competitors are not present in the table. For some lines, other exporters play an important role such as EU27, Mexico or other ASEAN countries.

6 SENSITIVITY ANALYSIS ON SOME OTHER STRUCTURAL ASSUMPTIONS

6.1 Changing assumption on trade balance

In the MIRAGE model, the standard assumption on the current account is that the trade deficit complemented with transnational investment and capital returns remains constant as a share of world GDP. This reflects a long-term equilibrium hypothesis: if a trade deficit appears, the effective exchange rate will depreciate and exports will rise to balance the system. However, this assumption can be discussed in the present case. The Vietnamese Dong is controlled by the State Bank of Vietnam and exchange rates are not set by the financial market. Moreover, the trade deficit widened in the last year. Imports rose faster than exports and trade deficit reached -$2,776 million in 2006 according to the IMF (4.6% of GDP). The role expected from WTO accession on this issue was not considered so far in our study. In order to bridge this gap, we ran another simulation with a fixed effective exchanged rate and an endogenous trade balance. The results show that with a constant effective exchange rate, Vietnam takes more benefit from the WTO accession thanks to a surplus of 2.1 billion dollars of the trade balance (see Figure 11). This result illustrates that the effect from WTO favours mainly exports with the end of textile quotas. Exports are also boosted as the currency does not appreciate with increasing foreign demand for Vietnamese goods. This effect is expected to compensate for the recent deepening observed over the last past years. However, in our baseline, we did not account for the effects of monetary policies (inflation, nominal exchange rates) which would be needed to better reproduce the path of Vietnamese trade balance over the period considered.

It is not relevant to assess long run welfare gains through this type of closure, considering that artificially fixed exchange rate prevents adjustment, which affects strongly the level of prices and revenues in case of extra exports. Moreover, we only look at the welfare results for the final year, which does not allow to account properly for the effects of transitory imbalances. However, it is interesting to observe the short run impacts suggested by such an assumption, which can be described by GDP variation. Indeed, under a fixed exchange rate, real wages decrease in all sectors and the national GDP expressed in dollars is strongly diminished (see Figure 12). This could have significant consequences as Vietnam is a very open economy. In the present case, the year of the end of quotas, the GDP in volume gains 1.3% but gains for GDP in value are limited to 0.6% and consumption drops by 1.2% following the drop in salaries. The growth in GDP volume is kept high through an increase in the number of unskilled workers hired in formal urban sectors (+3.9%). In 2015, the GDP gain in volume is only 1.0% and the welfare loss -1.7% if no equilibrium occurs on exchange

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Figure 11: Trade balance under fixed real effective exchange rate closure
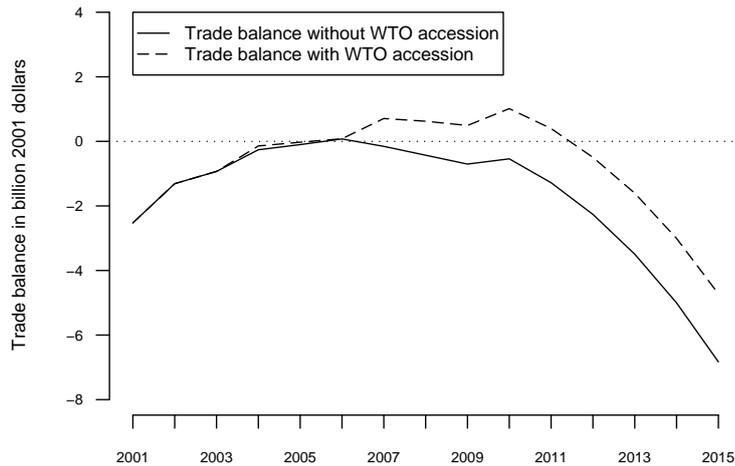
Source: Authors' calculations with MIRAGE

rate.

These results are interesting in showing that macroeconomic assumptions are not neutral for the assessment of such policy. The long term benefits of Vietnam accession to WTO appears to be positive as long as imbalances come back to an equilibrium. In the short run, the immediate effects of accession could be more ambiguous and will rely on macro economic policy led by the State Bank of Vietnam in a current context of increasing trade deficit and inflation concerns.

6.2 Role of the labour market modelling

Most CGE models rely on a perfect mobility assumption in labour markets. Workers can freely move from one sector to another, without any friction neither adjustment costs, and wages are ruled by an open competition market which is perfectly cleared. These assumptions, convenient for a first approach, are highly debatable when addressing sensitive issues such as trade liberalisation, especially when involved countries have an obviously sluggish labour market with a high level of unemployment or underemployment. Weaknesses of CGE models on this point have been emphasized recently by various modellers (see among others Maechler & Roland-Holst, 1995; Marouani, 2002; Polaski, 2006; van der Mensbrugghe, 2007). Numerous attempts have been done to implement more satisfying descriptions of market imperfections

Table 12: WTO accession: Results with different modelling assumptions

Variation in 2015	scenario scenario	Fixed effective exchange rate	Perfect labour market
GDP	2.4%	1.0%	0.1%
Exports (value)	8.4%	9.2%	5.0%
Imports (value)	7.0%	4.3%	4.5%
Terms of trade	-1.4%	-1.5%	-0.7%
Real effective exchange rate	1.0%	0.0%	1.0%
Real wages unskilled	1.6%	0.6%	1.5%
Real wages skilled	1.8%	-1.0%	-0.4%
Capital return	6.4%	7.3%	4.5%
Foreign direct investment	4.7%	4.5%	2.4%
Welfare	0.9%	-1.7%	-0.5%

Source: Author's calculations with MIRAGE

such as segmentation between rural and urban, formal and informal, public and private labour markets.

In our central scenario, we use a specific design for the labour market, considering the peculiar situation of Vietnam, with a large labour reservoir in the countryside and a migration toward cities benefiting to industry and services. As explained in Section 3, we set up a dual labour market for unskilled labour in Vietnam and we assume that wages are exogenous in urban sectors because labour supply is not constrained due to migration, unemployment and informal economy workforce.[31]

Among recent contributions, van der Mensbrugghe (2006, 2007) underlines that considering fixed wages with unlimited labour supply as a modelling of underemployment can lead to significant change of gains for developing countries. Indeed, free entrance of new workers facing expanding industrial labour demand allows us to reproduce the rapid expansion of these sectors, which is usually more constrained when assuming full employment and endogenous wages. These observations commend to be particularly vigilant concerning labour market assumptions in models.

We studied the sensitivity of our results to an alternative standard representation of the labour market. It appears that using perfect labour specifications dramatically changes the results in our case (see Figure 12). GDP gains decrease from +2.4% in the central scenario to +0.1% with this design, mainly because of limited creation of activity (no unemployment and no productivity change between rural and urban

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[31] This design, first developed in the model in Bouët et al. (2004), is more fully described in Decreux & Valin (2007).

sectors). Welfare is unsurprisingly impacted because of the loss of the quota rent (only allocated to Vietnam producers in our approach, the most pessimistic consideration, see Dimaranan et al. (2005) for more description on quota regime in Vietnam) and drops by 0.5%. This rent is no longer compensated by the creation of new jobs because of constraints on labour supply.

7 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% 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% of it) and of the new market access for textile and garment (for 61% of it). Predicting the evolution of the garment sector, which became the first exporting sector for Vietnam in 2008, is however a delicate task and conditions the nature of the results. 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). We also show that the dynamics of the labour market is important to allow a full development of these sectors, by taking benefit of the powerful resources of migrants and being watchful on skilled labour demand. But 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 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 remains to be investigated but 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. However, 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.

Third, our work illustrates one more time, if needed, the important role of labour market specifications. Perfect labour market cannot be used for developing economies

even for multilateral assessments without introducing a significant bias in the results. Last, macroeconomic closure usually used in CGE relies on long run macroeconomic balance, which can be also questioned in the case of rapidly developing countries with significant imbalances. In the case of Vietnam, we find that introducing different assumptions can lead to dramatically different results.

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.

Table 13: Vietnam's accession to WTO: Summary of the results presented in the paper

Variation in 2015	(1)	(2)	(3)	(4)	(5)	(6)	(7)
GDP	2.4%	0.5%	3.7%	1.6%	1.3%	1.0%	0.1%
Exports (value)	8.4%	0.8%	18.8%	10.7%	3.9%	9.2%	5.0%
Imports (value)	7.0%	0.9%	20.9%	10.5%	4.1%	4.3%	4.5%
Terms of trade	-1.4%	-0.1%	-3.0%	-1.9%	-0.6%	-1.5%	-0.7%
Real effective exchange rate	1.0%	-0.2%	-2.7%	1.5%	0.8%	0.0%	1.0%
Real wages unskilled	1.6%	0.4%	4.5%	1.7%	1.3%	0.6%	1.5%
Real wages skilled	1.8%	0.9%	7.8%	0.5%	1.5%	-1.0%	-0.4%
Capital return	6.4%	0.6%	12.3%	8.9%	4.3%	7.3%	4.5%
Foreign direct investment	4.7%	1.0%	16.3%	5.6%	3.2%	4.5%	2.4%
Welfare	0.9%	0.4%	1.5%	-0.4%	1.0%	-1.7%	-0.5%

Note: (1) Central scenario specifications: WTO with end of quotas

          (2) WTO without end of quotas

          (3) WTO and free trade commitments on the period 2001-2015 (ASEAN, China, Japan, Korea)

          (4) Central scenario + Sectoral TFPs

          (5) Central scenario + Sectoral TFPs + improved AVE for textile quotas

          (6) Central scenario + Fixed effective exchange rate

          (7) Central scenario + Perfect labour market

Source: Author's calculations with MIRAGE

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APPENDIX

A   AGREGGATION NOMENCLATURE

Table 14: 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, LKA, 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 15: Sectoral aggregation used for the modelling

Name	Description	GTAP codes
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, Machinary, 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 vehicles 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

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