THE DISTRIBUTIVE IMPACT OF VIETNAM'S ACCESSION TO THE WTO[1]

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ABSTRACT. Vietnam joined the World Trade Organization in January 2007. The fast economic growth observed for the last decades has resulted in a strong reduction of poverty and increasing inequalities. This paper evaluates the potential distributive impact of the WTO accession using a macro-micro model. The latter couples a CGE model, including imperfect labour markets, with an accounting micro-simulation model. We do not limit ourselves to the tariff impact. We also evaluate the impact of improved market access and of increased foreign direct investment. Our simulations show that WTO accession will have mainly four types of distributional effects: job gains, especially in the manufacturing sector; growth in real wages, especially for unskilled workers; reduction of poverty; and increase in inequalities between rural and urban areas.

JEL Classification: C68; F16.
Keywords: International Trade; WTO; Labour; Inequalities; Vietnam.

RÉSUMÉ. En janvier 2007, le Vietnam a adhéré à l'Organisation mondiale du commerce. La croissance économique rapide enregistrée ces dernières années s'est traduite par une réduction significative de la pauvreté et un accroissement des inégalités. Dans cet article est évalué l'effet redistributif qu'une adhésion à l'OMC peut avoir, à l'aide d'un modèle micro-macroéconomique. Celui-ci combine un modèle d'équilibre général calculable, avec marchés du travail imparfaits, à un modèle de micro-simulations. L'étude évalue l'impact non seulement des variations tarifaires, mais aussi de l'accès accru aux marchés et de l'augmentation des investissements directs étrangers. Les simulations montrent qu'adhérer à l'OMC aura essentiellement quatre effets redistributifs : plus d'emplois, surtout dans le secteur manufacturier ; hausse des salaires réels, notamment pour les travailleurs non qualifiés ; diminution de la pauvreté ; augmentation des inégalités entre zones rurales et urbaines.

Classification *JEL* : C68 ; F16.
Mots-clefs : Commerce international ; OMC ; emploi ; inégalités ; Vietnam.

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1.   INTRODUCTION

The reforms undertaken by Vietnam since *Doi Moi* have been very successful in enhancing growth, attracting foreign investment and fostering exports, and reducing poverty significantly. The two major challenges facing Vietnam in the near future are to ensure the sustainability of the economic performances and to avoid a surge in inequality which could endanger social cohesion and political stability.

Vietnam joined the World Trade Organization (WTO) in 2007. The accession to WTO has been initiated to secure Vietnam's access to the leading markets and to anchor the domestic reforms on strong external commitments. The objective of this article is to capture the potential links between Vietnam's accession to the WTO and the evolution of income distribution. This is all the more important as further trade liberalization and world integration could widen the gap between those operating in the most dynamic exporting sectors and those operating in the rest of the economy. Also, the geographic concentration of foreign direct investment (FDI), which contributes to explain the observed increase in inequality, could be reinforced by the accession to WTO.

Accession to WTO is supposed to speed up trade liberalization and improve market access for the new member country's exports, which should result in increased trade. According to the Heckscher-Ohlin model of comparative advantages, this should benefit unskilled labour in developing countries (their comparative advantage) while increasing national income. As a result, wage inequalities and poverty should be reduced (Winters *et al.*, 2004). But whether the membership in the WTO has actually an impact on the level of trade remains a subject for debate (Rose, 2004; Subramanian and Wei, 2003). Also, the empirical experience concerning the impact of trade and trade liberalization in many developing countries seems to contradict the conclusions of standard economic theory. Indeed, evidence from developing countries shows that, despite greater openness: a) inequalities (especially wage inequalities) have rather tended to increase (Goldberg and Pavcnik, 2007), particularly in the case of Latin America, but also China, Vietnam, etc.; and b) the impact of trade liberalization (but not of trade) on poverty appears to be small on the whole (Wade, 2004; for Vietnam see Abbott *et al.*, 2009).

At the same time, the simulations of the distributional impact of trade liberalization produce relatively contradictory findings. Mabugu and Chitiga (2007) consider that the impact on the poor is negative in the short run and positive in the long run in the case of South Africa. The same goes for Annabi *et al.* (2005) in the case of Senegal. Bannister and Thugge (2001) quote studies that posit that liberalization has a negative impact on the poorest households. Robilliard and Robinson (2005) use a micro-simulation model to simulate the impact on Indonesia of different trade liberalization scenarios. According to their findings, all scenarios result in poverty reduction, without any substantial variation in income inequalities.

In this article, we evaluate the distributive impact of Vietnam's accession to WTO. We take into account not only the tariff reductions, which are relatively modest on the whole, but also the impact of improved market access (end of quotas) and increased foreign direct

investment. We propose an *ex ante* evaluation based on a macro-micro model where workers are distinguished by skill, gender and location. The impact of WTO accession will mainly be transmitted to households via consumption and production price effects as well as the labour market (factor endowments and returns on factors). The type of factors held by each household, their remuneration (growth in wages and incomes) and their utilization rate will play a key role in the households' capacity to take advantage of the new macroeconomic and sector dynamics.

The Section 2 of the article presents the socio-economic context in Vietnam and the main challenges related to WTO accession, the latter being the result of a long process of reform and integration into the world economy. The Section 3 describes the macro-micro model, coupling a computable general equilibrium (CGE) with a micro-simulation model, which is used to evaluate the distributive impact of WTO accession. The Section 4 presents the results of the simulations of the medium term impact of the main shocks related to WTO.

2. VIETNAM'S ACCESSION TO WTO: GROWTH, EMPLOYMENT AND INCOME DISTRIBUTION TRENDS

The launch of *Doi Moi* (Renovation) in 1986 marked Vietnam's transition to a "socialist-oriented market economy" and the start of a process of integration into the world economy, with remarkable results in terms of growth and poverty reduction. This section presents the main commitments taken by Vietnam for joining WTO, as well as by the other members towards Vietnam, which cover many aspects of the economy. Then, we study the leading current trends in terms of growth, employment, poverty and inequalities as the growth model followed by Vietnam in the last twenty years has brought about sweeping economic and social changes. This analysis allows pointing out the main areas in which the WTO may have an impact.

2.1. The accession to WTO: endorsement of a long process of reform and integration into the world economy

Vietnam largely pre-empted its accession to the WTO in 2007 with rapid tariff disarmament starting in the 1990s. For example, the average tariff (arithmetic mean) was cut to 17.4 percent on the eve of accession compared with 23.3 percent ten years earlier. The effective rate of protection[3] fell even more quickly, as it more than halved from 59.5 percent in 1997 to 26.2 percent in 2001 (Athukorala, 2006). In industry, the effective rate of protection dropped from 121.5 percent to 43.9 percent. After the 1994 lifting of the US trade embargo, Vietnam also signed a number of trade agreements that have stepped up its process of economic growth and international integration: by becoming a full member of ASEAN (Association of South-East

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3. The effective rate of protection for a good is calculated as the sum of the rate of tariff protection applied to the good multiplied by the price for this good on the world market, from which is subtracted the protection rate applied to the intermediate goods incorporated into the production process, multiplied by the price for these goods on the world market.

Asian Nations) in 1995, it became a member of the Asian Free Trade Area (AFTA) and then of the ASEAN-China Free Trade Area (ACFTA); it also signed the United States-Vietnam Bilateral Trade Agreement (USBTA), which came into force into 2002.

Accession to the WTO is therefore something of an endorsement of a long process of reform and integration into the world economy. The additional WTO-related trade liberalization, spread over a long period (12 years), is modest and gradual. Between 2007 and 2019, the average consolidated tariffs will decline from 17.4 percent to 13.4 percent, agricultural tariffs from 23.5 percent to 21 percent and non-agricultural tariffs from 16.6 percent to 12.6 percent (WTO, 2006). In return, Vietnam has improved its access to WTO member markets and the quotas imposed on its textile and apparel exports were lifted at the beginning of 2007.[4] Last of all, the two main types of tariff exemption measures designed to foster exports or reduce imports (that is duty drawbacks and rules on local content) will have to be abolished following accession since they are contrary to WTO rules.

To sum it up, the additional trade liberalization for goods following WTO accession is limited on the whole (except for a small number of products). Moreover, the tariff-change repercussions of WTO accession will be reduced by the fact that a large part of Vietnam's foreign trade is conducted with regional partners with whom it is associated in free trade areas being set up (ASEAN, China). The same observation can be made for market access (except for textiles-clothing) as Vietnam was already granted Most Favoured Nation (MFN) status on the major industrialized countries' markets.

Tariffs aside, Vietnam has made some much more restrictive commitments than those set generally by WTO membership, especially as regards the abolition of export subsidies and opening up to foreign capital. In preparation for its accession to the WTO, Vietnam has substantially rewritten its commercial legislation and legal procedures in recent years. The legislative framework applicable to contracts, property rights and the settlement of trade disputes has hence been considerably simplified and modernized (World Bank, 2006). Moreover, in joining the WTO, Vietnam has undertaken to give foreign businesses the same treatment as its national businesses (*national treatment* principle). A new business law was therefore passed in 2005 to apply the same regulatory framework to national (public and private) and foreign firms.

The foreign direct investment measures taken are in keeping with the TRIMs (Trade-Related Investment Measures) agreement. Since January 2008, foreign companies can also have 100 percent-owned subsidiaries in most sectors of activity (in telecommunications, the maximum share has been fixed at 49 percent). Vietnam has also committed to speed up its privatisation programme, including a number of banks and major telecommunications companies. This wide set of policy measures makes Vietnam's business environment even more attractive to FDI than it used to be before WTO accession.

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4. Nevertheless, Vietnam's access to the world's leading markets (especially the United States and the EU), where it is still seen as a non-market economy (NME) remains shaky. As it has been observed for China which also joined WTO in 2001 with the same NME status, this makes Vietnam more vulnerable to anti-dumping procedures.

2.2. Restructuring of production and employment

Since the launch of *Doi Moi*, an emerging dynamic private sector has gone together with a large public sector, with state-owned companies (SOEs) controlling huge segments of the economy. An export-led growth model has been followed, combined with import substitution policies and strong industrial and agricultural public policies (Cao and Tran, 2005). Over the last two decades, Vietnam's GDP growth has hovered around 7.5 percent per year. Since the beginning of the current decade, the Vietnamese economy posts the highest growth in Asia after China (Chaponnière and Cling, 2009). The opening-up of the economy is even more rapid. The export growth rate (50 percent of them being manufactured products) is the highest in Asia.

The structure of GDP has changed radically since 1990 (TABLE 1). Whereas the share of agriculture has been halved, the share of industry has almost doubled (from 23 to 42 percent in 2006), and that of services has remained stable (38 percent). Changes in the structure of employment have been slower as 55 percent of the population still worked in agriculture in 2006. However, industry (19 percent) and services (26 percent) both increased their share of total employment. Approximately 5.7 million jobs were created between 2000 and 2006 (+7 percent per year in industry and +4 percent per year in services).

Table 1 - Evolution of the structure of GDP and employment

	1990	1995	2000	2006
Sector share (percent of GDP in current prices)				
Agriculture	38.7	27.2	24.5	20.4
Industry	22.7	28.9	36.7	41.6
Services	38.6	44.1	38.8	38.0
Employment structure by economic sector (percent of total employment)				
Agriculture	72.7	69.7	65.1	55.7
Industry	13.2	13.2	13.1	18.9
Services	14.1	17.1	21.8	26.4

Notes: Agriculture includes fishing and forestry.
Industry: includes mining, construction and utilities (electricity, water).
Source: General Statistical Office (2007).

Vietnam's impressive economic growth triggered a sharp increase in the rate of wage employment (from 15 percent in 1993 to 32 percent in 2004) across all the different categories of population. At the same time, wage earners' average annual remuneration grew over the same period (with an average annual growth rate of 4.6 percent). Real wages increased in rural and in urban areas. These two positive trends are the striking facts of the labour market development in recent years.

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Nevertheless, the structure of skills barely moved over recent years. According to the 2004 VHLSS, a total of 80 percent of the workforce are unskilled (i.e., according to the SAM 2000, those who have not been educated past lower secondary school level). Some 15 percent are considered to be semi-skilled (those who have been to upper secondary school). The skilled workforce (higher education) accounts for just 5 percent of employed workers.

Although the rate of unemployment is extremely low, the labour market is still a long way from full employment: at national level, approximately one-quarter of the total volume of labour that could be mobilized was not used in 2004.[5] Consequently, a labour demand shock induced by an increase in demand in production terms (growth in demand for exports and/or rise in domestic consumption) could be absorbed without triggering a strong increase in unit labour costs liable to undermine the competitiveness of firms in Vietnam.

But the rate of underemployment is not homogeneously distributed by skills. Underemployment decreases the higher one climbs up the skills ladder: from 25 percent for unskilled manpower to less than 16 percent among the most highly skilled. The room for manoeuvre in terms of employment growth is consequently all the greater as creations will concentrate on the least skilled jobs. Moreover, upward pressure on wages will be relatively stronger for skilled jobs in which there are already manpower shortages in certain sectors.

According to international trade theory, following the development of trade, demand for the most abundant production factors increases and their relative remuneration rises (Stolper-Samuelson theorem). So a major challenge for a developing country like Vietnam is whether WTO accession will tend to increase industrial employment and reduce the wage gap between the abundant unskilled labour and the less abundant skilled labour following past trends. Between 1997-2004, real industrial wages grew by 15 percent for unskilled workers and by 11 percent for skilled ones (on the whole, +20.1 percent for women and +16.6 percent for men).

2.3. Sharp drop in poverty but increased inequalities

The strong growth posted by the Vietnamese economy has sent poverty rates tumbling since the 1990s (TABLE 2). The overall monetary poverty rate has been slashed by nearly three-fourth since 1993, from 58 percent to 16 percent in 2006 (World Bank, 2008).[6] Income growth has been widespread, concerning agricultural incomes (increases in productivity, new cash crops, etc.) as well as other kind of incomes (especially wages in industrial and services sectors, see above). Several studies have shown the overall positive impact of trade reform on growth and poverty reduction in Vietnam, although the size of this impact is debated (Abbott *et al.*, 2009; Litchfield *et al.*, 2008).

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5. The VHLSS surveys can be used to calculate an indicator of the labour factor utilization rate. This indicator is defined as the ratio of the number of hours actually worked in the year (all jobs together) to the number of potential hours (each member of the labour force – employed workers and unemployed – being able to work a maximum of 48 hours per week, which is the statutory working week in Vietnam.

6. See Notes, TABLE 2.

Table 2 - Poverty rates

	1993	1998	2002	2004	*Percent change* 2006
Poverty rate	58.1	37.4	28.9	19.5	16
Urban	25.1	9.2	6.6	3.6	3.9
Rural	66.4	45.5	35.6	25.0	20.4
Kinh and Chinese	53.9	31.1	23.1	13.5	10.3
Ethnic minorities	86.4	75.2	69.3	60.7	52.3
Food poverty	24.9	15.0	10.9	7.4	6.7
Urban	7.9	2.5	1.9	0.8	1.2
Rural	29.1	18.6	13.6	9.7	8.7
Kinh and Chinese	20.8	10.6	6.5	3.5	3.2
Ethnic minorities	52.0	41.8	41.5	34.2	29.2

Notes: Two poverty lines have been defined in Vietnam. The food poverty line is the annual amount of money required to purchase a "typical" basket of food items allowing a daily intake of 2100 calories. The general poverty line is a higher threshold that allows for the purchase of that basket of food items and the purchase of a minimal amount of non food items (clothing, transport, etc.).
Source: World Bank (2008).

Poverty reduction has benefited urban populations the most. The share of the population living in poverty remains high in rural areas (and especially among ethnic minorities). At regional level, highly contrasting poverty trends are found (TABLE 3). In the South-East region and, to a lesser extent, in the Red River Delta, monetary poverty has virtually disappeared. However, certain regions have benefited less from the widespread reduction in poverty (e.g. the North-West).

Table 3 - Poverty rates across regions

	1993	1998	2002	2004	*Percent change* 2006*
Poverty rate	58.1	37.4	28.9	19.5	16
Northern Mountains	81.5	64.2	43.9	35.4	30.2
Northeast	na	na	38.4	29.4	25.0
Northwest	na	na	68.0	58.6	49.0
Red River Delta	62.7	29.3	22.4	12.1	8.8
North Central Coast	74.5	48.1	43.9	31.9	29.1
South Central Coast	47.2	35.5	25.2	19.0	12.6
Central Highlands	70.0	52.4	51.8	33.1	28.6
Southeast	37.0	12.2	10.6	5.4	5.8
Mekong Delta	47.1	36.9	23.4	15.9	10.3

*Data for 2006 are unofficial.
Source: World Bank (2008).

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Consequently, there has been an upturn in inequalities, albeit less marked than in China. The country's Gini index rose from 0.34 to 0.36 from 1993 to 2006 and the inter-quintile ratio (ratio between the population's richest and poorest quintiles) rose from 5 to 6 over the same period, reflecting the emergence of an upper middle class concentrated in the cities.[7] The rise of overall inequality has been mainly driven by the increase in inequality between rural and urban areas, although its contribution to overall inequality change has been losing its relative importance for the last few years (VASS, 2006).

Considerable amounts of foreign direct investment received by Vietnam (FDI represents 56 percent of total exports) contributed to increased regional inequalities, and especially to increase the concentration of economic activity in Vietnam around the two major urban centres, that is Ho Chi Minh City (HCMC) and Hanoi. Most industrial production and the majority of non-agricultural employment are concentrated in these two regions, as it is shown in TABLE 4. The South East (HCMC and surroundings) receive more than half of all FDI while the Red River Delta (Hanoi and its region) receives over one-quarter. All in all, the country's two leading economic regions attract some 85 percent of foreign investment whereas only 38 percent of the population lives in these regions. This concentration is behind some profound imbalances and a factor in the large flows of domestic migration by Vietnamese workers.

We underlined in this first section the main characteristics and specificities of the Vietnamese economy. Our analysis also put in evidence the differential impact of trade and growth on employment, income and poverty in the past, according to location, skills and sectors of activity. A main challenge of modelling presented in the next section is to take into account these specificities, such as the imperfections of labour markets, in order to evaluate more accurately the distributional impact of WTO.

Table 4 - **Share of Red River Delta and South-East in some economic and demographic indicators**

Percent change

	South East	Red River Delta	Total South East+RRD	Total Vietnam
Industrial production	56.0	19.2	75.2	100
FDI (1988-2007), excl. oil	57.8	27.3	85.1	100
Active population	14.9	23.0	37.9	100
Wage workers	23.2	25.2	48.4	100
Total population	16.4	21.6	38.0	100

Notes: Industrial production and population=2006; Active population and wage workers=2004. FDI data correspond to disbursed investment.

Source: General Statistical Office (2007).

7. Although, the human development indicators have globally evolved in a highly positive manner, analyses of the change in non-monetary welfare and health indicators reveal also an increase in inequalities (Moser *et al.*, 2005; Tran *et al.*, 2003).

3. PRESENTATION OF THE MACRO-MICRO MODEL

Computable General Equilibrium (CGE) models are the most commonly used tool for evaluating the macro-economic impact of trade policies. Standard CGE models usually rely on the definition of a few representative household groups characterized by different combinations of factor endowments and possibly different behaviours. The heterogeneity of the population of households is thus integrated in a scarce and unsatisfactory way, since the inequality modelled is essentially the inequality between the representative groups. In many situations, the decomposition of observed inequality evolution has shown that within-group inequality is often as important as between-group inequality (Cogneau *et al.*, 2003). The same holds for inequality changes. This explains why traditional macroeconomic models may appear unsatisfactory in dealing with distributional issues.

Different approaches that rely on full household/individual samples have been developed recently to overcome this difficulty (see Cogneau *et al.*, 2003). They differ in how they account for micro behaviours and in the degree of integration of the macro and micro "stories". In this paper, we evaluate the impact of Vietnam's accession to the WTO using a static CGE model based on a social accounting matrix (for the year 2000) and sequentially linked with a micro-accounting micro-simulation model in order to analyse the distributional issues. This type of sequential macro-micro model has already been used to study, among other things, the impact of trade policies in Indonesia (Robilliard and Robinson, 2005) and in Vietnam (for a survey see Abbott *et al.*, 2007).

This section presents a brief description of the different stages in the construction of our macro-micro model in relation to the WTO accession shocks that we propose to analyze. By linking a CGE model and a representative household survey, this model relaxes the representative agent assumption currently adopted by standard CGE models, so that the distributional impact of the WTO can be examined in detail.

3.1. The CGE model

Applied CGE models rely on Social Accounting Matrices (SAM) as their base year data. These SAM provide more or less detailed account of the circular flows in the economy. Depending on the problem at hand, the various accounts can be specified at different levels of aggregation.

The Social Accounting Matrix (SAM) used here was developed from the SAM constructed for the year 2000 by CIEM (Jensen *et al.*, 2004) and data drawn from the 2004 VHLSS survey.

The matrix's level of disaggregation chosen for this study is as follows:[8]
- 31 activities/31 commodities;
- 14 production factors including 12 types of labour (rural/urban, male/female and three skills levels);
- 4 institutional accounts (1 household, 1 business, government and rest of world);
- 1 savings/investment account.

A careful analysis of CIEM's SAM structure revealed that the sub-matrix of payments of value-added to production factors – especially the flows remunerating the different types of labour – presents an artificial regularity: the identical structure of flows of value-added derived from the 31 activities and paid to the different types of labour suggests a calibration of all the flows based on an "average" structure when the SAM was constructed. In addition to being unrealistic, this regularity is problematic in that any shock triggering a reallocation of factors among sectors "inevitably" induces a strictly identical increase in the remuneration of the different production factors; consequently this leads to an underestimation of the distributional effects generated by the shock in question.

Since the distributional question is the focus of the study, the SAM had to be "corrected" by constructing a more realistic sub-matrix (Factors–Activities). This was done by using the 2004 VHLSS survey data stating the characteristics, economic sector and wages of each individual. This information was used to recalibrate the structure of flows in the matrix (Factors–Activities), subject to a few adjustments due to the fact that the SAM's sector disaggregation does not correspond exactly to the VHLSS activity code disaggregation.

The model. The model code used is taken from CIEM and corresponds to the standard IFPRI model (Löfgren *et al.*, 2001). Its specification follows the neoclassical-structuralist modelling tradition presented in Dervis *et al.* (1982). It incorporates additional features of particular importance in developing countries such as: an explicit treatment of transaction costs for commodities that enter the market sphere; and a separation between production activities and commodities that permits any activity to produce multiple commodities and any commodity to be produced by multiple activities. This model constitutes the macro module of our macro-micro model. In its current version, the CGE model is a static multisector model in which a small number of macroeconomic closure possibilities and fairly standard closure possibilities (perfect flexibility or perfect rigidity) for the factor markets can be chosen.

In the CGE model, three types of institutions are represented: households, the government, and the "Rest of the world". The income and expenditure flows of these institutions are represented in FIGURE 1.

This figure shows that households receive income from the factors of production and transfers from other institutions. They use their income to pay direct taxes, save, consume, and make transfers to other institutions. The savings share is either flexible or fixed, according to the

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8. The SAM constructed by CIEM comprises 112 sectors, but in view of the correspondence problems at both "macro" level (shock given by the CEPII) and "micro" level (VHLSS data), this is too high a level of disaggregation. We therefore applied a less detailed level of aggregation to the SAM.

macroeconomic closure (it is fixed in our simulations, see here below). The income that remains after taxes, savings, and transfers to other institutions is spent on consumption. Household consumption is allocated across different commodities (both market and home commodities) according to linear expenditure system (LES) demand functions, derived from maximization of a Stone-Geary utility function. The government collects taxes and receives transfers from other institutions and uses this income to purchase commodities for its consumption and for transfers to other institutions. Government savings is the difference between government income and spending. The third and final institution is the "Rest of the world". The model does not separate out different foreign regions: foreign trade flows concern just one region called "Rest of World". Foreign savings (or the current account deficit) is the difference between foreign currency spending and receipts.

Figure 1 - **Major payment flows represented in the CGE model**
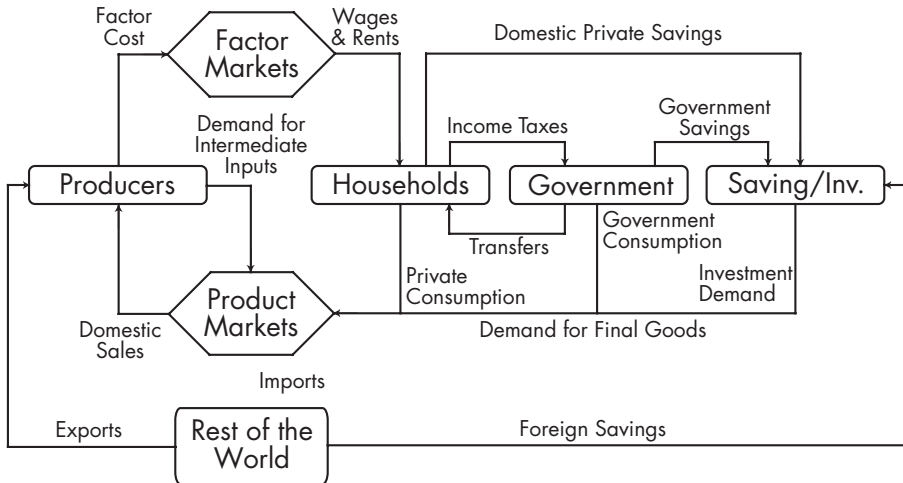
Source: Löfgren *et al.* (2001).

A number of improvements have been made to the model, concerning more particularly:
- the modelling of foreign trade, especially export demand;
- the modelling of the labour market, including the introduction of wage rigidities (wage curve).

The introduction of an export demand function into the model takes into account the fact that the share of Vietnamese exports in world trade is constrained by various barriers, especially non-tariff barriers (quotas) in the textile sector. WTO membership should lift these barriers and therefore increase demand for exports. To be more precise, the export demand function is written for each commodity C:

$$QED_c = qed_c^0 \left(\frac{pwe_c}{PED_c}\right)^{\eta_c}$$

where:

QED_c is the demand for exports of commodity *C*;

qed_c^O is the demand for exports of commodity *C* in the base year;

pwe_c is the world price for commodity *C* in local currency;

PED_c is the domestic export price for commodity *C*;

η_c is the price elasticity of export demand for commodity *C* (Armington elasticity);

The difficulties met for modeling precisely the extremely rapid opening of the Vietnamese economy must be underlined. Abbott *et al.* (2009) present a detailed criticism of the specifications of the export demand functions in the case of Vietnam: due to the lack of data, Armington elasticities cannot be estimated; moreover, the standard elasticities used in these functions do not allow us to predict the remarkably fast growth of exports during the last decades; the latter problem is also due to the existence of supply effects which are not well taken into account in standard models.

As regards labour market functioning, the model represents a relatively segmented market with twelve types of labour considered. In the standard version of the model, a wage rate is associated with each factor and two alternative representations of labour market functioning are possible:

- either the wage rate is flexible and supply and demand for each labour type is balanced in keeping with a full factor employment hypothesis;
- or the wage rate is fixed and the supply-demand balance comes about by adjusting the labour supply in keeping with a factor underemployment hypothesis.

The introduction of a wage curve provides an intermediate representation of labour market functioning. The wage curve is written:

$$\log(WF_F) = A1_F + A2_F \log(U_F) + A3_F \log(WG_F)$$

where:

WF_F is the wage rate for factor *F*;

$A1_F$, $A2_F$ and $A3_F$ are the curve parameters;

U_F is the level of unemployment of factor *F*;

WG_F is the wage rate for factor *F* in the administration.

As shown, this specification relates the wage rate with two other variables: the level of unemployment and the public wage rate. Given that the public wage rate is fixed, the main difference brought by the wage curve specification is that any adjustment on the labour market will affect both the wage rate and labour supply. For example, an increase in labour demand will lead to both an increase in the wage rate and an increase in the quantity of labour employed.

A number of choices are also possible when it comes to the model's macroeconomic closure. Macroeconomic closure refers to the set of rules or balances applied to attain the model's macroeconomic equilibrium. In the model we use, there are three of these rules:
- fiscal equilibrium can be attained by adjusting government savings or by adjusting its revenue;
- current-account balance equilibrium can be attained by adjusting the real exchange rate or foreign savings;
- savings-investment equilibrium can be attained by adjusting investment or adjusting the savings of one of the model's agents.

3.2. The micro-simulation model

The data. On the micro side, the decision was made to construct a micro-accounting (excluding behaviour) micro-simulation model using data from the 2004 VHLSS survey. The microeconomic base includes:
- the structure of wage income by type of labour (12);
- the structure of non-wage income by sector (31);
- the structure of non-labour income (6);
- the structure of consumption by product type (31).

The complete 2004 VHLSS survey contains some 45,000 households, but consumer expenditure was only collected for 9,000 of them. So it is only these 9,000 households that are included in the model.

The model. The study of the distributional impact of the shock considered compares the distribution of a welfare indicator in the base year (before the shock) with the distribution of the same welfare indicator after the shock. The welfare indicator used is *per capita* income. The micro-simulation model takes as its starting point the distribution observed from the 2004 VHLSS data and simulates a new distribution by updating the different types of household income on the basis of the variations generated by the CGE model. This computation is based on the following income model:

hhincpc0 is *per capita* income in the base year defined as the sum of the different types of income divided by the size of the household:

$$hhincpc0 = (hhwageinc0 + hhselfinc0 + hhnlabinc0)/hhsize$$

where:
- *hhwageinc0* is wage income in the base year;
- *hhselfinc0* is self-employment income in the base year;
- *hhnlabinc0* is the sum of non-labour income in the base year;
- *hhsize* is the size of the household.

More precisely, these three types of income are written as follows:
- $hhwageinc0 = \Sigma_f wt0(f)$ where f = 1 to 12;
- $hhselfinc0 = \Sigma_a revb0(a)$ where a = 1 to 31;
- *hhnlabinc0 = revdivid0 + revtrpub0 + revtrpri0 + revremit0 + revimmob0 + revterre0.*

Where:
- *wt0(f)* is the wage income derived from factor f in the base year;
- *revb0(a)* is the self-employment income a in the base year;
- *revdivid0* is the income from financial assets in the base year;
- *revtrpub0* is the sum of public transfers in the base year;
- *revtrpri0* is the sum of domestic private transfers in the base year;
- *revremit0* is the sum of remittances from abroad in the base year;
- *revimmob0* is the income from real estate assets (excluding land) in the base year;
- *revterre0* is the income from land rental in the base year.

The simulated *per capita* income calculation is based on the simulation of the different types of income making up the sum total and on the simulation of a specific price index to take account of the differences in households' consumption structures. The simulation of the different elements of income is based on the base year data and the variations in price and quantity generated by the CGE model.

As stated in the presentation of the CGE model, several types of labour market closures are possible. In the case of a labour market adjustment by prices and quantities, a rule has to be found to distribute the increase in value-added remunerating the 12 labour factors in the different sectors (macro level) at household level (micro level). This increase is made up of two components: an increase in the quantity of labour (volume) and an increase in wages (price). The solution chosen consists of taking into account the rates of underemployment at the level of each household to distribute the growth resulting from the change in terms of volume of labour.

Two other assumptions on the functioning of the labour market are important. The first relates to rural-urban divide and the second to the regions. As mentioned earlier, 12 types of labour are considered both in the CGE model and at the micro-simulation level. These 12 types of labour are differentiated by gender (male/female), skill level (unskilled/medium skilled/highly skilled) and by area of residence (urban/rural). The segmentation between the 12 markets associated with each type of labour is perfect which implies that our model does not take into account the possibility of migrations between rural and urban areas. At the micro-simulation level this implies that a rural household will always remain rural and the same for an urban household. This lack of labour mobility is likely to overestimate inequality effects between rural and urban areas since migration flows are likely to reduce the rural-urban gap. The second important assumption relates to the regions. At the micro-simulation level, households are residents of one of 8 regions. However, at the macro level, "regions" cannot be represented due to the lack of availability of regional Social Accounting Matrices. This implies that two households living in different regions but who derive their income from the same type of labour will experience the wage shock associated with that type of labour, with no regional differentiation of the shock. Thus, by construction, the income changes between the regions stem only from a "structural effect" in that it is the regional factors endowment structure that explains why different regions experience different incomes changes. There is not any "price effect" since we do not model labour market segmentation between regions.

The CGE model and the micro-simulation model are used sequentially:
- the shock considered is initially simulated using the CGE model;
- this model generates, for each simulation, a vector of variations in a certain number of variables;
- these vectors constitute the shocks that are fed into the micro-simulation model's simulations.

Compared to some previous studies which have used micro-simulations models to assess the impact of WTO on Vietnam (see Abott *et al.*, 2007), our model is more elaborate. First of all, we take into account imperfect labour markets and the existence of an export demand function. Secondly, previous models and their underlying SAMs make very strong assumptions on the distribution of factor incomes, which make their results less reliable. Last of all, as explained below, we try to take into account in this paper the impact of various commitments made for WTO accession and not only tariff reductions.

4.   ANALYSIS OF THE SIMULATIONS

In this section, we present the scenarios simulated using the micro-simulation model (TABLE 5) and then the main results of the simulations from both the macroeconomic and microeconomic point of view (TABLES 6 to 12).

4.1.   The scenarios simulated with the model

Using the model chosen for the study, we analyse three types of economic shocks we consider to be the main shocks following WTO accession:
- a decrease in import tariffs; this corresponds to Vietnam's commitments to reduce customs protection (tariff and non-tariff); as underlined here above, the further opening of the domestic market is globally very limited, as most of trade liberalization has been made before accession;
- an increase in demand for exports of goods from Vietnam; this corresponds to what the WTO members do in return for Vietnam's trade liberalization commitments, in particular, lifting of the textile quotas imposed by the United States (as a consequence of this lifting Vietnam is planned to become the second supplier of these products on the US market in 2008, after China);
- an increase in foreign direct investment; this increase can already be observed, the total amount of projects having been multiplied by 2.5 in 2007, that is the first year after accession; it is due to Vietnam's greater appeal to foreign multinationals following its entry into the WTO (easing of restrictions imposed on FDI, improved market access for exporting firms, etc.).

Scenarios 1 and 2 are calibrated to the exogenous shocks modelled by the CEPII (combination of tariff shocks and export demand), which correspond to the first two above mentioned types of shocks.

We then add to these concomitant shocks an industrial FDI increase shock (scenarios 3 and 4). This increase would be expected to drive up the stock of available capital in the sectors in which foreigners invest. However, since our model is static, it does not directly model the conversion of investment flows into additional capital. Investment flows simply constitute another form of demand on the commodity market. Data on the structure of industrial capital in Vietnam show that foreigners hold approximately 35 percent of the capital in the industrial sector. Consequently, a doubling of FDI flows should eventually culminate in a 35 percent increase in the stock of capital in the industrial sectors. We have modelled our FDI shock to include this increase.[9]

The macroeconomic closure rules applied to all the scenarios considered are as follows:

- real government consumption is fixed while fiscal equilibrium is attained by adjusting government savings;
- foreign savings are fixed and current-account balance equilibrium is attained by adjusting the real exchange rate;
- finally, the savings-investment balance is "savings-driven" in that investment is determined by the sum of private, government, and foreign savings.

This choice of closure was driven by two types of considerations. One the one hand, since we are exploring welfare changes in a single period model we are not able to capture welfare losses in later periods that arise from a larger foreign or domestic debt and a smaller capital stock. That would commend to fix foreign savings, real government consumption, as well as real investment ("Johansen closure"). On the other hand, however, we are reproducing a real shock that is likely to affect investment, for better or for worse. In order to capture this likely effect, we believe it is more accurate to use the savings-driven "neoclassical closure" in which investment is determined by the sum of private, government, and foreign savings.

Lastly, each simulation is considered under two alternative labour market closure assumptions: full employment (adjustment by wages) and underemployment with wage rigidities (adjustment by wages and labour supply); as seen above, the latter better reflects the functioning of the labour market in Vietnam.

All the simulations are made for a five-year forecasting period starting in 2004, set as the base year. TABLE 5 presents all the simulated scenarios.

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9. In reality, the huge surge observed in FDI does not concern solely industry, but also services (to enterprises, tourism, etc.). Nevertheless, without data on foreign holdings in these sectors, it is hard to evaluate the total rise in capital due to FDI; we have therefore preferred, at this stage, to consider solely the effect of the additional industrial FDI.

Table 5 - Description of the scenarios

External shocks	Labour market closure assumption	
	Flexible (full employment)	Rigid (underemployment with wage rigidity)
Decrease in import tariffs and increase in export demand for textiles	Scenario 1	Scenario 2
Decrease in import tariffs and increase in export demand for textiles +35 percent increase in the stock of capital in the industrial sectors	Scenario 3	Scenario 4

Note: The increase in the stock of capital affects sectors that produce: processed food; tobacco, beers & alcohol; sugar; cement; paper; fertilizer and pesticides; automobile and other transport vehicles; ferrous metals; garment and leather; chemicals and other manufactured products.

4.2. The main aggregate results of the simulations

From the point of view of the macroeconomic aggregates, the first two scenarios, which combine a tariff decrease with an increase in export demand, only have a modest impact on real GDP. There is zero impact in scenario 1 under the assumption of full factor employment (where only a pure factor reallocation effect is observed); the impact is slightly positive in scenario 2 under the assumption of factor underemployment (TABLE 6). The modest magnitude of the GDP increase is not surprising given that the tariff decreases is relatively small and that the export demand translates mainly into factor reallocation. This limited impact of the simulated shock related to trade liberalization on growth is consistent with the existing relative consensus among economists that the effect of the trade policies has been overestimated compared with the effect of other types of policy and other economic factors (World Bank, 2005). Empirical observation of the link between trade policies and growth (country studies) also suggests that the effect is indeed modest in most cases, in keeping with the findings of CGE models.

Nevertheless, trade flows grow considerably with a 3.6 percent (resp. 3.8 percent) increase in the volume of imports and a 1.5 percent (resp. 1.9 percent) increase in the volume of exports for scenario 1 (resp. 2). This increase in trade flows occurs in tandem with an appreciation of the Vietnamese currency associated with the upturn in export demand.

Table 6 - Results of the simulations: macroeconomic aggregates

	Base	Variation (*Percent change*)			
		Scenario 1	Scenario 2	Scenario 3	Scenario 4
Real GDP	44,164.7	0.0	0.4	2.2	3.3
Exports	24,189.5	1.5	1.9	5.8	7.0
Imports	25,365.9	3.6	3.8	6.3	7.1
Exchange rate	100.0	−1.7	−1.5	−2.4	−1.8

Note: Exchange rate, a drop corresponds to a Dong appreciation.

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Not surprisingly, the increase in the stock of capital in the industrial sectors (scenarios 3 and 4) gives rise to significantly greater effects: real GDP increases 2.2 percent (resp. 3.3 percent) while the volume of imports increases 6.3 percent (resp. 7.1 percent) and the volume of exports increases 5.8 percent) (resp. 7.0 percent) in scenario 3 (resp. scenario 4).

The macroeconomic impact is systematically higher in the scenarios under the assumption of labour factor underemployment (scenarios 2 and 4): in a demand shock situation, the additional effect on GDP is obtained *via* an increase in the employment rate. The mechanism is similar in the case of an increase in capital stocks in the industrial sectors (scenarios 3 and 4): this increase has a direct effect on the economy's production capacities.

Tariff reduction plays a role in the decrease of tax revenues (TABLE 7). *Ex ante*, this decrease represents 5.6 percent of customs receipts (0.8 percent of the State budget). *Ex post*, the tax loss associated with liberalization is partially offset by the increase in the volume of imports (the drop in tariff revenues *ex post* comes down to 4.7 percent in scenario 1) and by the increase in other sources of tax revenues (at constant taxation rates).

The Vietnamese tax system is based on various taxes collected on the institutions' incomes (households and businesses), at the sector level (value-added tax and tax on output) and on consumer goods (special consumption taxes). Yet the factor reallocation triggered by the tariff reduction shocks and the increase in export demand is in the direction of the sectors where these rates of taxation are relatively high. Moreover, these shocks have a positive effect on the institutions' incomes, contributing overall to a slight upturn in direct taxation revenues.

Table 7 - Results of the simulations: central government revenue

	Base	Structure (*Percent change*)	Variation (*Percent change*)			
			Scenario 1	Scenario 2	Scenario 3	Scenario 4
Transfers from Rest of World	202.8	2.2	−1.7	−1.5	−2.4	−1.8
Direct taxes	2,794.3	30.8	2.4	3.1	−1.2	1.1
Taxes on factors	1,122.5	12.4	1.6	2.3	−0.3	1.9
Taxes on imports	1,359.5	15.0	−4.7	−4.3	−3.4	−2.0
Taxes on value-added	1,506.7	16.6	3.3	3.6	1.3	2.2
Taxes on productive activities	1,701.5	18.7	0.8	1.2	4.1	5.5
Taxes on consumer goods	387.6	4.3	0.9	1.3	4.0	5.3
Total	9,074.9	100.0	0.9	1.5	0.2	1.8

As expected, from a macro-economic perspective, taking into account both underemployment and the increase of FDI following WTO accession has positive macro-economic effects. The impact of WTO is significantly higher than if we limit ourselves to estimating the impact of pure trade policies and if we adopt a full employment hypothesis. These results confirm the

importance of policy measures concerning the business environment in the case of Vietnam; they also underline the fact that the size of the WTO accession impact will depend on the capacity to mobilize underutilized factors of production.

4.3. Substantial sector reallocations of employment

At the sector level, the combined impact of tariff reduction and the increase in export demand (scenarios 1 and 2) gives rise to a reallocation of factors to the textile sector (TABLE 8). It is indeed this sector that has posted the sharpest increase in export demand: accession to the WTO has induced a rise of nearly 40 percent in demand for Vietnamese textile products.[10] This demand shock triggers a sharp rise in the sector's value-added, which increases by anything from 10 percent to over 25 percent depending on the scenarios. The sharpest increases are obviously under the scenarios that include the capital stock shock (scenarios 3 and 4), and especially under the assumption of factor underemployment (scenario 4).

Table 8 - Results of the simulations: value-added by sector (in volume)

	Base	Variation (*Percent change*)			
		Scenario 1	Scenario 2	Scenario 3	Scenario 4
Primary sector	10,749	−0.6	−0.4	−0.5	0.4
Including:					
Rice	3,400	−0.6	−0.4	0.6	1.8
Coffee	409	−1.4	−1.2	−3.6	−2.5
Sugar cane	206	0.1	0.3	6.4	7.5
Secondary sector	15,375	0.9	2.1	8.0	10.2
Including:					
Cement	298	1.1	1.6	5.1	6.9
Textiles and apparel	1,277	9.5	10.0	23.4	25.0
Chemicals	798	−0.9	−0.4	9.0	10.7
Tertiary sector	14,592	−0.1	0.4	1.3	2.5
Including:					
Construction	2,287	1.8	2.4	1.7	3.6
Retail-wholesale	4,124	1.0	1.5	7.6	9.0
Transport	862	−0.7	−0.3	−0.7	0.4

In the first scenario, since the quantity of labour is fixed in the economy but is nonetheless mobile between sectors, the sector demand shock brings about a reallocation of labour towards the textile sector at the expense of most of the other sectors. The latter consequently experience a downturn in their value-added, the quantity of capital being fixed both in each sector and overall. The hardest hit sectors in relative terms are the steel industry and the fertiliser production sector. In absolute terms, the hardest hit sectors are the oil sector and

10. As mentioned earlier, the model does not separate out different foreign regions: the foreign trade flows concern just one region called "Rest of World".

the other services as well as the real estate sector, banking and telecommunications. These findings remain valid under the assumption of labour underemployment (scenario 2), albeit to a lesser extent.

In the most open sectors, except the textile and apparel sector whose export demand rises sharply, the impact of the tariff reductions and export demand shocks (scenarios 1 and 2) is negative on the whole. This finding is explained by the appreciation of the Dong, the effect of which is that non-tradable commodities become more expensive than tradable commodities. These mechanisms largely explain the downturn in value-added in most of the agricultural sectors in the first two scenarios. Conversely, non-tradable activities, especially the retail and wholesale sector and construction, gain a relative benefit from the appreciation of the Vietnamese currency.

In the last two scenarios (3 and 4), the increase in the stock of capital in the manufacturing sectors offsets the negative impact of appreciation in most of the sectors. This increase pushes up all manufacturing output with positive effects on the production of the other sectors, especially those that supply the most intermediate inputs to the manufacturing production sectors (cement, chemicals, etc.). In all the scenarios, the secondary sector (industry) emerges as the main winner of WTO accession, followed by the tertiary sector and then the primary sector in which gains are virtually zero.

These sector reallocations go hand in hand with variations in factor remuneration, especially the wage rate for the different types of labour. The results presented in TABLE 9 show that the simulated shocks exert strong upward pressure on wages, even under the assumption of labour underemployment. In this case, the pressure on the labour markets is solved by an increase in both wage rates and the quantity of labour.

However, the pressures on the labour markets induced by the simulated shocks are more or less strong depending on the type of labour. For example, the sharpest increases are found in the wage rates for urban semi-skilled and unskilled female labour, the factors most in demand by the textile sector: these increases are sharper in full-employment scenarios 1 and 3 than in underemployment scenarios 2 and 4, where the wage rate increases are lower but are accompanied by an increase in the labour demand for these factors. Whatever the scenario, women's wages rise more than their male counterparts (the deviation is as high as five points in scenario 3), in particular as regards the large number of unskilled and semi-skilled wage earners in the textile and apparel sector. WTO accession has therefore helped reduce the wage gaps between genders.

The sector reallocation of production and employment and the evolution of wages simulated by our model correspond to a Heckscher-Ohlin type specialization: Vietnam comparative advantage lies in abundant unskilled labour, which is largely employed in the textile-clothing sector (apart from agriculture). The production of this sector increases strongly following the reduction of trade barriers. This evolution has two main impacts on other sectors of activity: first of all, an increase of wages for unskilled workers, which has a negative impact on the least performing sectors; secondly, an appreciation of the exchange rate because of the

export growth of textile-clothing. This appreciation tends to favour sectors producing non-tradable goods (construction, trade) and to impact negatively on sector producing tradable goods (coffee, rice).

The production factors which benefit the most from trade liberalization are those employed most intensively in expanding sectors (especially in textile-clothing), that is unskilled and semi-skilled urban female workers. The main losers are unskilled rural male workers, especially rice and coffee producers. Nonetheless, the increase of capital stock (scenarios 3 and 4) increases the remuneration and demand for both rural and urban unskilled and semi-skilled work. This is due to the fact that sectors which benefit from the increase of capital stock employ mostly unskilled and semi-skilled (rural and urban) labour.

Table 9 - Results of the simulations: wage rates and demand for labour by type

				Variation (*Percent change*)			
	Wage rate		**Base**	**Scenario 1**	**Scenario 2**	**Scenario 3**	**Scenario 4**
Rural	Male	Unskilled	0.298	0.4	0.5	5.3	3.4
		Semi-skilled	0.606	1.5	1.0	5.8	3.7
		High skilled	1.620	1.0	0.6	0.1	0.6
	Female	Unskilled	0.179	1.1	0.8	6.3	3.9
		Semi-skilled	0.413	2.8	1.5	7.9	4.6
		High skilled	0.853	0.8	0.5	2.2	1.5
Urban	Male	Unskilled	0.740	2.3	1.5	6.4	4.3
		Semi-skilled	2.027	0.9	0.7	4.0	2.8
		High skilled	6.288	1.2	0.7	3.3	2.1
	Female	Unskilled	0.611	3.9	2.1	11.1	6.5
		Semi-skilled	1.542	5.2	2.7	8.5	5.0
		High skilled	2.806	1.3	0.8	2.2	1.8
	Labour demand		**Base**	**Scenario 1**	**Scenario 2**	**Scenario 3**	**Scenario 4**
Rural	Male	Unskilled	14,982		0.3		1.9
		Semi-skilled	2,194		0.6		2.0
		High skilled	465		0.4		0.4
	Female	Unskilled	17,235		0.5		2.1
		Semi-skilled	1,781		0.9		2.5
		High skilled	292		0.3		0.9
Urban	Male	Unskilled	2,783		0.9		2.4
		Semi-skilled	958		0.4		1.6
		High skilled	407		0.4		1.2
	Female	Unskilled	3,226		1.2		3.2
		Semi-skilled	899		1.5		2.6
		High skilled	378		0.5		1.0

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4.4. Income, poverty and inequality impact

These price variations and, depending on the case, quantity variations are then worked into the micro-simulation model in keeping with the rules presented in the previous section. Household incomes are formed from an aggregate of different types of incomes that post varied changes depending on the sector (for self-employment income) or the factor (for wage income) on which they depend. The impacts of the simulated shocks on the three types of income are presented in TABLE 10.

All the types of income increase with the exception of non-labour income, which depends in part on fixed foreign-exchange remittances from abroad whose value in Vietnamese currency diminishes due to the appreciation of the Dong. Incomes from self-employment activities post the highest increases: in the last scenario, these increases are as high as 12.3 percent in urban areas and 7.5 percent in rural areas.

At the aggregate level, the increase in earned income generates sharp increases in total income, in both rural and urban areas, albeit with a significant advantage to the urban areas: depending on the scenario, income growth is 1.3 to 3.6 times higher in urban areas than in rural areas. This deviation reflects essentially sector effects: the industrial sector, set up mainly in urban areas, is the leading WTO winner (along with services to a certain extent) while the impact on agriculture, the main activity in rural areas, is less positive on the whole.

Table 10 - Microeconomic results: household income

Urban	Base	Structure	Variation (*Percent change*)			
			Scenario 1	Scenario 2	Scenario 3	Scenario 4
Wage income	87,611.3	39.4%	2.3	2.1	5.6	5.6
Self-employment income	77,903.9	35.0%	3.3	3.5	11.2	12.3
Non-labour income	57,061.6	25.6%	0.0	0.2	−0.7	−0.2
Total household income	222,576.8	100.0%	1.8	1.7	5.8	6.0
Rural	**Base**	**Structure**	**Scenario 1**	**Scenario 2**	**Scenario 3**	**Scenario 4**
Wage income	73,087.9	24.3%	0.9	1.1	5.3	5.4
Self-employment income	173,112.9	57.5%	0.8	1.1	6.6	7.5
Non-labour income	54,700.0	18.2%	−0.2	−0.1	−0.4	−0.2
Total household income	300,900.8	100.0%	0.5	0.7	4.1	4.6
National	**Base**	**Structure**	**Scenario 1**	**Scenario 2**	**Scenario 3**	**Scenario 4**
Wage income	160,699.2	30.7%	1.7	1.6	5.5	5.5
Self-employment income	251,016.8	48.0%	1.6	1.8	8.0	9.0
Non-labour income	111,761.6	21.3%	−0.1	0.1	−0.6	−0.2
Total household income	523,477.6	100.0%	1.1	1.1	4.8	5.2

This increase in household incomes ultimately induces sharp drops in the incidence of poverty, which can be analysed at regional level by the VHLSS survey data on which the micro-simulation model is built (TABLE 11). First of all, the decreases systematically appear highest in the urban areas. This finding is explained first by the sharper rise in incomes in urban areas (see above) and second by the fact that poverty rates are lower in urban areas and that a 1 percent increase in income prompts a sharper reduction in poverty: for example, in scenario 2, a 1 percent increase in urban income results in a 4.4 percent drop in the incidence of poverty in urban areas as opposed to just 1.9 percent in rural areas.

Contrasting results are also found at regional level. The regions with the highest level of factors demanded by the textile sector post the sharpest drops in poverty: these decreases are particularly sharp in the South-East (including Ho Chi Minh City) and the Mekong River Delta (where the high level of underemployment accentuates the drop in poverty). Nonetheless, one must bear in mind that, as mentioned earlier, the macro model (CGE) only represents market functioning at national level. While regions are differentiated by their production factor endowments and hence by the structure of the resident households' incomes, the model is built on an assumption of perfect commodity and factor market integration. Because of this assumption, the variations of price and quantity generated as the result of the shocks are not differentiated by region. This feature is likely to underestimate the possible divergence between regions.

Table 11 - Microeconomic results: poverty rates

Urban areas	Base	Variation (*Percent change*)			
		Scenario 1	Scenario 2	Scenario 3	Scenario 4
Red River Delta	14.7	−0.1	−2.5	−8.4	−10.7
North-East	28.4	0.5	−0.3	−5.2	−8.8
North-West	48.9	1.2	0.1	−2.6	−5.1
North Central Coast	34.8	−2.3	−2.0	−4.7	−9.8
South Central Coast	19.6	−0.2	−3.4	−6.9	−10.5
Central Highlands	27.3	0.0	0.6	−7.4	−11.2
South-East	5.1	0.3	−0.8	−15.0	−17.7
Mekong River Delta	15.0	−2.6	−3.5	−14.0	−21.4
National average	**19.5**	**−0.8**	**−1.7**	**−7.5**	**−11.8**
Urban average	**4.7**	**−3.4**	**−7.5**	**−8.4**	**−33.8**
Rural average	**24.6**	**−0.6**	**−1.3**	**−7.5**	**−10.3**

From the point of view of inequalities (TABLE 12), there is a very slight positive impact – i.e. inequalities increase – in all scenarios. In general, the rise in inequalities is lower under the assumption of labour underemployment (scenarios 2 and 4). This can be explained by the fact that the labour allocation rule is progressive insofar as it provides work to households proportionally to their unemployment rates and that those unemployed are likely to be the poorest.

Changes in national inequalities can be decomposed using various household classification criteria. Here with present decompositions according to area of residence (urban vs. rural),

region of residence (8 regions), and household skill level (medium and highly skilled vs unskilled). For each criterion, the change in the Theil index can be decomposed into the sum of the change in inequalities *within* households groups and in inequality *between* household groups. Figures in the second column of TABLE 12 indicate that whatever the criterion used, *within* group inequality represents a high share of total inequality: this share varies from 78.8 to 87.1 percent. It is however the changes in *between* group inequality that usually post the highest values.

Table 12 - Microeconomic results: Theil index

	Base	*Percent change*	Variation (*Percent change*)			
			Scenario 1	Scenario 2	Scenario 3	Scenario 4
National	0.311		0.8	0.2	1.4	0.1
Between urban & rural	0.066	21.2	3.8	3.0	4.7	3.9
Within urban & rural	0.245	78.8	0.1	−0.5	0.6	−0.9
Between regions	0.048	15.4	2.6	1.1	3.1	−1.1
Within regions	0.263	84.6	0.5	0.1	1.1	0.4
Between skilled & unskilled	0.040	12.9	2.4	1.8	2.1	1.5
Within skilled & unskilled	0.271	87.1	0.6	0.0	1.3	−0.1

Note: The Theil index are calculated on the basis of *per capita* income. The theil index is a statistic used to measure economic inequality.

The formula is : $T = \dfrac{1}{N}\sum_{i=1}^{N}\dfrac{y_i}{y}\times\ln(\dfrac{y_i}{y})$

where y_i is income of individual *i* and *y* is the mean income, and *N* is the number of people. Varies between 0 (total equality) and 1 (total inequality).

A study of changes of inequality between the various household groups considered in TABLE 12, indicates that it is inequality between urban and rural areas that increases the most thus contributing to the national increase in inequalities. The widening of urban-rural inequalities is itself due to a sharper rise in urban incomes (see TABLE 10). In the case of scenario 4, this rural-urban divergence is nevertheless offset by a significant decrease in urban inequalities, which can be attributed to the progressive labour allocation rule.

The increase in inequalities between urban and rural areas is the result of a fairly simple mechanism: the figures in TABLE 9 show that labour remuneration (and labour demand in the case of scenarios 2 and 4) increases more sharply in urban areas than in rural areas. This is true for all types of labour. This contrasting impact is itself due to a structural effect: urban labour is employed mainly by sectors that post the sharpest increase in value-added following accession.

The divergence in living standards between rural and urban areas is nothing new in Vietnam. Glewwe *et al.* (2000) showed that the increase in inequalities observed in the 1990s against a backdrop of sharp growth was due mainly to this divergence and their finding was confirmed by VASS (2006) for the 1993-2004 period. In the case of WTO accession, this increase could

nevertheless remain modest due to the progressive aspect of growth in labour remuneration: the increase in unskilled labour remuneration is higher than that for skilled labour.

Changes in inequality between groups defined by the other classification criteria (regions and skills) appear to be smaller than changes between rural and urban areas. Concerning regions, this is in part an artefact (and limit) of our model since it is constructed on a Social Accounting Matrix that provides no information on the structure of production and labour markets in the different regions. Overall, our results concerning the effect of the WTO shock on inequalities at the national level is subject to two kinds of biases, the resultant of which is unknown:

- on the one hand, the model underestimates the effect of the WTO shock on inequalities since we make the assumption of perfect labour mobility between regions, which assumes in particular the free movement of manpower;[11]
- on the other hand, our model does not take into account the possibility of migrations between rural and urban areas (ie, after the shock a rural household will always remain rural and the same for an urban household); although this constraint can be considered as being sensible when making short term simulations, this overestimates inequality effects between rural and urban areas.

To correct these limitations, a more realistic modeling of the manpower reallocation process should therefore be introduced at a later stage.

One could also expect a negative impact on ethnic minorities: as these are concentrated in geographic areas and sectors of activity where the growth impact could be the smallest (with increased vulnerability), the income gap with the majority (Kinh) could increase, following recent trends (Baulch *et al.*, 2007). However, our model does not allow us to take into account these effects in a realistic way.

Concerning skill levels, the inequality between skilled and unskilled households represents a relatively small share of total inequality measured by the Theil index. But results from TABLE 12 show that the between group inequality increases in all three scenarios. This is mainly driven by the strong increase in medium-skilled wages and labour demand (see TABLE 9).

To sum up the findings, the changes in inequality are relatively limited at the national level. This result is mainly due to the fact that the increase of labour demand induced by the WTO accession entails effectively the mobilisation of the underemployed factors which are also the most abundant, in keeping with international trade theory. Nevertheless, inequality between urban and rural areas rises significantly since the most dynamic economic sectors are concentrated in urban areas (and as migrations from rural to urban areas are not taken into account). Also, WTO accession induces an increase of demand for semi-skilled labour, which leads to a widening gap between categories of labour, even if this increase is smaller than the one obtained for urban/rural labour and has a limited impact on global inequality.

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11. Thus, by construction, the income changes between the regional level stem only from a "structural effect" in that it is the regional factors endowment structure that explains why different regions experience different incomes changes, not a "price effect" since we do not model (likely) labour market segmentation between regions In that sense, our model probably underestimates the impact of the WTO shock on inequality.

4.5. Policy measures to accompany WTO accession

Our findings (conditional on the assumptions made in our model) show the importance of taking measures to accompany entry into the WTO and make the most of the opportunities offered. This is all the more important since Vietnam has joined WTO at a critical period from a social point of view. Indeed, it is undergoing major changes (urban and demographic transition, etc.) and the challenges ahead are huge; especially as, according to the United Nations (UNFP, 2007), the number of new entrants on the labour market will peak around 2010. Four questions of major importance arise in this regard.

i) Training is a determining factor of a smooth adjustment on the labour market, as well as a means to get more qualified and better paid jobs. As three quarters of the active population are considered as unskilled, the challenge is huge. In the short run, it is especially important for people leaving rural areas to have the proper skills in order to get jobs in town. In the long run, training highly skilled people is a pre-requisite to avoid bottlenecks in new industries and services (to attract FDI in particular) and to prevent Vietnam from entering a "low-skilled labour intensive exports trap".

ii) Internal migration trends will have a decisive effect on wage adjustment; obviously, the migration policy conducted by Vietnam also needs to take into account other social considerations (such as putting a brake on the rural exodus to the cities in a move to check already-galloping urban growth); but growth in internal migration would seem inevitable to ensure that the cross-sector reallocation of employment, set to accelerate, occurs as smoothly as possible (and without excessive wage pressures). Steps should be taken to ease the migrant registration system (*ho khau*).

iii) Regional policies are needed to limit the widening of interregional and urban-rural inequalities; the extreme concentration of FDI in what are already the richest employment areas (Ho Chi Minh City and Hanoi), which our model cannot study directly, is expected to sharpen this trend; the government could increase geographic budget transfers and organise a partial redistribution of the gains secured by the WTO to the poorest regions (such as the North-West), which will not benefit (and might even lose out) from accession.

iv) Lastly, the policies to assist members of the workforce who lose their jobs should be continued, if not expanded, insofar as WTO membership will step up cross-sector reallocations and, within the sectors themselves, greater competition will reduce employment in the non-performing businesses (which is not evaluated by our simulations).

5. Conclusion

In this study, we have endeavoured to place Vietnam's accession to the WTO in the context of the economic and trade policies conducted by the country in recent years. This has enabled us to put into perspective the event represented by this accession, insofar as it is part of a long process of trade liberalization and integration into the world economy.

At the same time, recent economic history has shown that the trade agreements signed by Vietnam (ASEAN, USBTA, etc.) have all had a considerable effect on Vietnamese growth. As pointed out by Abbott *et al.* (2009), the studies made *ex ante* have tended to systematically underestimate the impact of these policies.

In the case of the WTO, the commitments made by Vietnam are much farther reaching than a simple tariff disarmament agreement. They affect all sectors of the economy, which makes it hard to model their impact. This is why virtually all the studies made previously are limited to an evaluation of the tariff impact, based moreover on provisional assumptions in that the access negotiations had not yet been concluded.

We have endeavoured here to expand the study in three areas:

- firstly, our study is the first (with Boumelassa and Vallin, 2009) to take into account the precise terms of the WTO agreement from the point of view of both Vietnam's trade liberalization commitments and the WTO members' commitments with regard to Vietnam;
- secondly, our findings are also interesting in that we have not only evaluated the impact of the reduced tariff protection (which is actually modest), but also the additional foreign demand (improved market access) and foreign direct investment (which had not been done before);
- lastly, our approach goes further than previous studies conducted using micro-simulation models; not only the distribution of factor income is better measured by our model, but we also take into account imperfect labour markets functioning.

The simulations made using our micro-simulation model show that WTO accession will have mainly four types of distributional effects: job gains, especially in the manufacturing sector, which is the great winner of WTO accession; growth in real wages; poverty reduction; and increase in inequalities between rural and urban areas (but reduction in gender inequalities). In each of these fields, the direction of the growth found by the model is in keeping with previous trends. This finding is hardly surprising since, as mentioned above, WTO accession is not an isolated shock, but part of a long process of international integration.

The study shows the importance of taking appropriate policy measures following WTO accession, especially in training and education, migrations, regional and social protection policies. It also suggests a few directions to improve our knowledge of these phenomena. First of all, our understanding of employment and labour market functioning in Vietnam (including the role of the informal sector) is still in its very early stages. The in-depth employment survey which was conducted in 2007 for the first time should bring further knowledge in this field. Also, the microeconomic impact of WTO membership needs to be evaluated in greater detail, by improving the modelling both at macroeconomic level (introduction of the dynamic aspects and of market imperfections related to the expected effects of WTO accession – services, competition, etc.) and at microeconomic level and macro-micro interface level (introduction of individual behaviour functions, integrated macro-micro models, etc.).

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REFERENCES

Abbott, P., Bentzen, J., Tarp, F., 2009. Trade and development: Lessons from Vietnam's past trade agreements, *World Development* (37)2, 341-53.

Annabi, N., Cissé, F., Cockburn, J., Decaluwé, B., 2005. Trade liberalisation, growth and poverty in Senegal: A dynamic microsimulation CGE model analysis, CIRPEE Working Paper 05-12.

Athukorala, P., 2006. Trade policy reforms and the structure of protection in Vietnam, *World Economy* 29(2), 161-87.

Bannister, G., Thugge, K., 2001. International trade and poverty alleviation, IMF Working Paper 01/54.

Baulch, B., Pham, H.T., Reilly, B., 2007. Ethnicity and household welfare in Vietnam: Empirical evidence from 1993 to 2004, Institute of Development Studies (Brighton), November, processed.

Boumelassa, H., Vallin, H., 2009. Vietnam's accession to the WTO: *Ex post* evaluation in a dynamic perspective, *Économie internationale*, in this issue.

Cao, X.D., Tran, T.A.D., 2005. Transition et ouverture économique au Vietnam : une différenciation sectorielle, *Économie internationale* 104, 4th quarter, 28-43.

Chaponnière, J.-R., Cling, J.-P., 2009. Vietnam's export-led growth model and competition with China, *Économie internationale*, in this issue.

Cogneau, D., Grimm, M., Robilliard, A.-S., 2003. Evaluating poverty reduction policies; The contribution of micro-simulation techniques, in Cling, J.-P., Razafindrakoto, M., Roubaud, F. (Eds), *New International Poverty Reduction Strategies*, London: Routledge, 340-70.

Dervis, K., de Melo, J., Robinson, S., 1982. *General Equilibrium Models for Development Policy*, Cambridge University Press, Cambridge.

Fujii, T., Roland-Holst, D., 2007. How does Vietnam's accession to the World Trade Organization change the spatial incidence of poverty?, United Nations University-WIDER Research Paper 2007/12, March.

Glewwe, P., Gragnolati, M., Zaman, H., 2000. Who gained from Vietnam's boom in the 1990s? An analysis of poverty and inequality trends, Policy Research Working Paper 2275, Policy Research Department, World Bank, Washington, D.C.

Goldberg, P.K., Pavcnik, N., 2007. Distributional effects of globalization in developing countries, *Journal of Economic Literature* 45(1), 39-82.

Jensen, H.T., Tarp, F., 2005. Trade liberalization and spatial inequality: A methodological innovation in a Vietnamese perspective, *Review of Development Economics* 9(1), 69–86.

Jensen, H.T., Rand, J., Tarp, F., 2004. A new Vietnam social accounting matrix for the year 2000, CIEM/NIAS, Science and Technics Publishing House, Hanoi.

Justino, P., Litchfield, J., Pham, H., 2008. Poverty dynamics during trade reform: Evidence from rural Vietnam, *Review of Income and Wealth* 54(2), 166-92, June.

Löfgren, H., Harris, R.L., Robinson, S., 2001. A standard computable general equilibrium (CGE) model in GAMS, TMD discussion papers 75, International Food Policy Research Institute (IFPRI), Washington, D.C.

Mabugu, R., Chitiga, M., 2007. Poverty and inequality impacts of trade policy reforms in South Africa, MPIA Working Paper 2007-19, University of Pretoria.

Moser, K.A., Leon, D.A., Gwatkin, D.R., 2005. How does progress towards the child mortality millennium development goal affect inequalities between the poorest and least poor?, Analysis of demographic and health survey data, *British Medical Journal* 331, November, 1180-83.

Robilliard, A.-S., Robinson, S., 2005. Social impact of a WTO agreement in Indonesia, in Hertel, T., Winters, A. (Eds), *Putting Development Back into the Doha Agenda: Poverty Impacts of a WTO Agreement*, World Bank, Washington, D.C.

Rose, A.K., 2004. Do we really know that the WTO increases trade?, *American Economic Review* 13(4), 682-98.

Subramanian, A., Wei, S., 2003. The WTO promotes trade, strongly but unevenly, IMF Working Paper 03/185, Washington, D.C., September.

Tran, T., Pham, T.L., Trudy, H., Nguyen, T.H., Tran, D.T., Tod, B., 2003. *Young Lives Preliminary Report: Vietnam*, London: Save the Children, September.

United Nations Fund for Population, 2007. Population projections for Vietnam by 2025, UNFP, New York.

VASS, 2006. Vietnam poverty update report 2006: Poverty and poverty reduction in Vietnam 1993-2004, Vietnamese Academy for Social Science, Hanoi, December, processed.

Wade, R.H., 2004. Is globalization reducing poverty and inequality?, *World Development* 32(4), 567-89, April.

Winters, L.A., McCulloch, N., McKay, A., 2004. Trade liberalization and poverty: The evidence so far, *Journal of Economic Literature* XLII, 72-115, March.

World Bank, 2005. Global economic prospects and the developing countries 2005, Washington, D.C., World Bank.

World Bank, 2006. Vietnam development report 2006, Business, Joint donor report to the Vietnam consultative group meeting, Hanoi, December.

World Bank, 2008. Vietnam development report 2008; Vulnerability, Joint donor report to the Vietnam consultative group meeting, Hanoi, December.

World Trade Organization (WTO), 2006. Accession of Vietnam: Report of the working party on the Accession of Vietnam, WT/ACC/VNM/48-27, October (06-5205), Geneva.