

Comparison of Carnegie, World Bank and CEPII's studies regarding the potential DDA impact on poor developing countries - Brussels, 1 June 2006

Two studies have recently been released and are contributing to the debate on the potential economic impact of the DDA on poor developing countries: "Winners and Losers: impact of the Doha Round on developing countries" by Sandra Polaski; "Would multilateral trade reform benefit Sub-Saharan Africa?" by Anderson, Martin and Van der Mensbrugge. The second study by a World Bank team is based on the same model and hypothesis as the much commented Anderson and Martin book (Agricultural Trade Reform & the Doha Development Agenda), but refocused on the results for Sub-Saharan Africa.

These studies will probably influence commentators' opinions regarding the most desirable final agreement. The most striking fact is that they come to opposite conclusions regarding the source of the gains in the round: from industry liberalisation for Carnegie, from agricultural market access for World Bank.

The differences in the results and the policy recommendations are not surprising as they are directly linked to very different key underlying assumptions on scenarios and technical parameters. Far from being inconsistent, this variety of results helps in highlighting the underlying mechanisms which shape the economic impact of any DDA agreement.

This note puts in perspective the results of the two studies with those computed by CEPII in a recent study.

The first section presents a comparison of the results of the three studies for a common "benchmark" scenario, the full cut of tariffs and subsidies, and for central Doha scenarios. The second section discusses the underlying parameters and assumptions which explains the important differences in the results.

1. COMPARISON OF RESULTS BETWEEN DDA ESTIMATES

1-1 Full liberalisation scenarios

Carnegie and World Bank reports concentrate only on merchandise trade liberalisation without examining potential gains linked to service liberalisation and the strengthening of trade rules (in particular in the field of trade facilitation). This represents the main limitation of these studies, as all available economic estimates have underlined the importance of potential gains linked to these two negotiating pillars. CEPII's study confirms this fact, as a reduction of 50% of discriminatory trade barriers in services would add more than a quarter to the potential gains from the elimination of all tariffs and subsidies for industry and agriculture. On top of this, the gains are more than doubled if trade facilitation is taken into account. It has to be kept in mind that services and trade facilitation estimates are very rough because of a lack of data and because the theoretical basis of economic models in these two fields have been only recently developed and is still much debated. However, to ignore the potential gains linked to these two negotiating fields leads to a misinterpretation of the DDA's likely impact on the world economy.

Table 1: Gains in case of full liberalisation

Overall gains in \$bn		Full liberalisation		
		Carnegie	World Bank	CEPII
Goods	DCs	75	86	53
	Sub-Saharan Africa	4	4	-1
	Developed countries	93	202	179
	World	168	287	232
Services (50% cut)		-	-	60
Trade Facilitation		-	-	330

1-2 Estimates of a potential DDA outcome for merchandise trade

All three studies present some results for various DDA outcomes regarding merchandise trade liberalisation.

Table 2: Results for Doha scenarios regarding merchandise trade liberalisation

Doha scenarios	Carnegie*	CEPII**	World Bank***
gains in \$bn			
AMA	5	29	75
NAMA	53	39	22
TOTAL	58	68	96
proportion in %			
AMA	9%	43%	78%
NAMA	92%	57%	22%

* Central Doha Scenario / ** Doha Scenario B / *** Scenario 7

It is a striking fact that the Carnegie and World Bank studies come out with opposite results regarding the share of the gains linked to agricultural versus non-agricultural market access. CEPII's study is somehow in between the two other studies regarding both the overall level of gains and the partition between the Agriculture and NAMA pillars. Section 2 below discusses the source of these differences.

1-3. Results for less advanced countries

Overall, for the group of countries from Sub-Saharan Africa, the World Bank's study finds no gain or no loss in the central Doha scenario: a gain of \$0.1bn for the group of Southern African countries excluding South Africa and a loss of \$0.1bn for the group "rest of Sub-Saharan Africa" (which represents the major part of the region). However, even the "no-gains-no-loss" outcome for this group of countries can be put into question when relaxing some of the most debatable assumptions (see section 2 for a discussion of these assumptions and the consequences on the results).

Contrary to the World Bank, but in line with CEPII results, Carnegie's study finds that DCs would lose slightly as a group from the agricultural liberalisation (-€6.3bn) in the central Doha scenario. Again, as for CEPII's study but in contradiction with World Bank, there is a great heterogeneity in the outcome for different DCs.

- Heterogeneity of the results between DCs is linked to the extent of which each country could be adversely affected by three types of effects

- (i) The preferential access to some developed countries' markets granted to some of the DCs will be eroded by trade liberalisation (preference erosion).
 - (ii) Many DCs are net importers of basic food commodities. For many of these products, trade liberalisation is predicted to lead to price increases, linked to the reduction of agricultural subsidies. At the same time, they are net exporters of mainly tropical commodities or of energy, which are already highly liberalised and would not be much affected by the Round (negative "terms-of-trade" effect).
 - (iii) More importantly, in the simulation, the poorest countries are assumed not to cut their tariffs. Consequently, they do not benefit from any efficiency effects or any consumer gains in purchase power (absence of "own liberalisation effect").
- According to Carnegie and CEPPII's studies, only a handful of big agro-food exporters would benefit from an increased agricultural market access, namely: Australia and New Zealand, Brazil, Argentina, Chile, Thailand and South-Africa.
 - More than half the countries or regions in the developing world would be net losers in terms of their overall income if agriculture were the only sector to be liberalised.

In most DCs, the agricultural sector is mostly made up of subsistence farmers without a major interest, or much ability to export to foreign markets. By contrast, only very organised and efficient exporters can fully exploit access to developed countries' markets.

- By contrast, in Carnegie and CEPPII's studies, developing countries as a group gain substantially from the liberalisation of manufactured goods and individually this is the case for the vast majority of DCs.
- However, in both studies, when AMA is combined with NAMA, some countries would still loose in the aggregate. This is the case for Northern and Sub-Saharan Africa in CEPPII's study, for Bangladesh, East and Sub-Saharan Africa in Carnegie's study.

While in both studies Bangladesh, East and Sub-Saharan Africa are assumed not to liberalise and thus do not benefit of any "own liberalisation effect", this is also the case of North African countries, as members of the G90, but only in CEPPII's study.

Despite profound differences in the model assumptions, the two studies converge to this negative result for the poorest economies regarding goods liberalisation. However, by considering service liberalisation and trade facilitation, CEPPII's study shows that the poorest countries could significantly reverse this overall negative result and gain much from the Round in the aggregate.

1-4. CEPPII's study confirms that service and trade facilitation would represent the best chance for less advanced countries to get a positive outcome from the Round

All studies which include services or trade facilitation in their calculations find that the vast majority of the gains of the DDA lie precisely in these two important negotiating pillars (see in particular Global Development Report, World Bank 2004). Interestingly, even the recent and much commented World Bank book by Anderson and Martin confirms this point in its chapter II (less commented than chapter I).

All available economic studies indeed indicate that trade facilitation is the major source of gains for the world and particularly so for DCs. The estimates of trading costs are very rough. But there is broad agreement that basic trade facilitation measures represent savings of

about 2% of the value of trade. World Bank's recent book indicates that trade facilitation would bring gains in revenue of \$110bn a year¹.

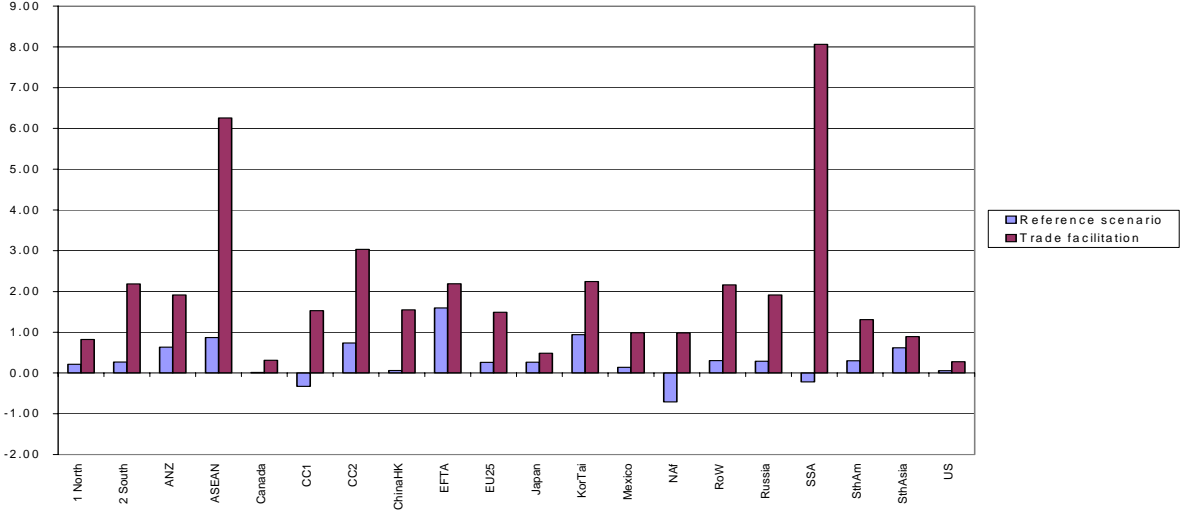
For CEPII, an ambitious scenario regarding trade facilitation would lead to very important gains for Sub-Saharan Africa, equivalent to a doubling of official development aid for this region.

Even if this trade facilitation scenario is very optimistic in comparison to what would be most probably achieved in this Round, any study assessing the economic effects of the Doha Round and omitting these aspects is missing one crucial element of the final equation.

For CEPII's study, trade facilitation has the potential to bring gains of \$330bn at the world level. This is roughly equivalent to the GDP of Russia.

How this enormous potential gain could be shared among participants is clear-cut and confirms the previous studies: the bulk of the gains, in relative terms, are concentrated in the South and in particular in the SSA region.

Figure 1: Welfare gains under scenario central Doha scenario with and without trade facilitation (2020, % change)



Source: CEPII (2006)

In absolute terms, some \$20bn would accrue to SSA countries. This compares very favourably with the Overseas Development Aid (ODA) received by the region (\$18.6bn on average in 2003 and 2004). In the same region, this would be associated with a 9.2% increase in unskilled real wage, hence contributing strongly to the alleviation of poverty.

Box 2: Assessing the potential benefits of trade facilitation
Wilson, Mann, Otsuki (2004), Policy Research Paper 3224, World Bank

¹ Hertel and Keeney (2006) in Anderson and Martin (ed): Agricultural trade reform and the DDA, World Bank.

The relationships between trade facilitation, trade flows, and capacity building are complex and challenging to assess, both empirically and in their implementation. The authors measure and estimate the relationship between trade facilitation and trade flows across 75 countries in global trade, considering four important categories: port efficiency, customs environment, regulatory environment, and service sector infrastructure. The results suggest that both imports and exports for a country and for the world will increase with improvements in these trade facilitation measures. The total gain in trade flow in manufacturing goods from trade facilitation improvements in all the four areas is estimated to be \$377 billions. All regions gain in imports and exports. Most regions gain more in terms of exports than imports, in large part through increasing exports to the OECD market. The most important ingredient in getting these gains, particularly to the OECD market, is the country's own trade facilitation efforts.

2. HOW TO EXPLAIN DIVERGING RESULTS?

Such opposite results could lead us to question the validity of these kind of economic studies. However, this section will explain that differences come (i) from diverging views regarding what a DDA outcome would be likely to look like and (ii) from diverging key assumptions and parameters regarding the underlying economic models. By explaining the relative importance of each key characteristic in these two sets of differences the current section helps in understanding what are the determining economic mechanisms and the key choices which shape the economic consequences of the Round.

2-1 Design of scenarios

Obviously, the design of scenarios does not play a role in diverging results in the “full cut benchmark” as all tariffs and subsidies are supposed to be suppressed in all three studies and as they rely on the same database regarding the level of protection by country.

Yet, the choices made in the Doha central scenario (reduction in agricultural and industrial tariffs, reduction of domestic and export subsidies by country categories) are of utmost importance with regards to the size and the repartition of the gains.

What is called the « central Doha scenario” in Carnegie report assumes an ambitious expansion of market access: 50% reduction in applied tariffs by developed countries and 33% reduction by DCs in NAMA against respectively 36% and 24% reduction in AMA.

In its Doha merchandise scenario, World Bank’s assumption is very different to Carnegie’s choice: the average world reduction of initial applied tariffs is twice as large for agricultural (-35%) as for non-agricultural products (-16%). This corresponds to a 5.3 points reduction of the world average applied tariffs in agriculture against a 0.5 point reduction for other products.

In the CEPII central Doha Scenario, industrialised countries would experience a reduction of 39% and 22% of their applied tariffs respectively in industry and agriculture while DCs (excluding G90) would experience respectively a 55% and a 19% cut.

Scenario regarding less advanced countries

While G90 countries are assumed not to liberalise in CEPII’s study, only LDCs are exempted of any tariff commitment in both the Carnegie and the World Bank studies.

For other poor DCs (excluding LDCs), very ambitious reduction rates are applied in Carnegie’s study (as stated above, 33% and 24% reductions in applied tariffs respectively for NAMA and AMA negotiations).

Despite the assumption of some commitments from LDCs, the situation is radically different in World Bank's study: the gap between bound and applied tariffs leads indeed to very small if any tariff cuts for the poorest countries in World Bank central scenario. Overall, southern African countries (except South Africa) would experience a 2.5% reduction of tariffs in the central scenario and 2.4% for the rest of Sub-Saharan Africa.

As a result, regarding the design of the DDA scenario, World Bank's study is very close to CEPIL's assumptions with almost no liberalisation for this category of countries.

2-2 Underlying parameters and assumptions

1. No adjustment of unskilled wages in industry, in Carnegie's study, leads to a concentration of the gains in NAMA and diverging profiles among DCs

The main difference between the Carnegie report and other simulations, in particular CEPIL's study, is related to the very specific design of the labour market in their model.

Carnegie's report is based on the assumption of two separate labour markets in agriculture and in industry. The total number of employed people is firstly determined by the activity level of industry. In a second step, the remaining labour force is assumed to return to a job in agriculture. In this sector, wages are the result of a classic supply-demand relation for labour.

This assumption of a dual labour market with a high rate of unemployment seems rather realistic in light of most developing countries' situation. However, the way this assumption is incorporated into Carnegie's model is highly debatable. Indeed, the model assumes that unskilled workers' wages in industry are fixed and that adjustment takes place only through wages in agriculture. This assumption leads to very opposite results when modelling trade policy changes depending on the initial situation of the country:

- (i) When a country is a successful exporter of manufactured products, trade liberalisation leads to a strong increase in manufactured exports with no balancing effect as unskilled workers' wages are supposedly constant in industry. This means that the country can rapidly increase its exports without any loss of competitiveness. In reality, competitiveness should be eroded as a surge in exports should fuel a stronger labour demand which itself should lead to wage increases. However, the model assumes that newly created jobs in industry are filled with workers coming from agriculture. While wages in industry remain constant, agricultural wages are rapidly increasing with strong positive effects on welfare and rural poverty.
- (ii) On the contrary, when a country is not originally competitive at exporting industrial goods, the model predicts that, in this sector, exports will decrease, imports will increase while only minor adjustments through wage costs are assumed to take place. As a consequence, industrial activity will contract, with strong negative side effects: industrial workers flow back into agriculture leading to a decrease in agricultural wages, a decrease in value added and an increase in poverty. Indeed, assuming that industrial wages remain constant whatever the level of activity means assuming that a country can not adjust its competitiveness through a reduction of industrial costs (by means of wage adjustment). The economy is thus forced to contract without rebalancing forces. This is at odds with what can be observed in particular in DCs: in real economies (and in other models), rebalancing forces (decreases in real wages for instance) play a non-negligible role in smoothing the adverse effects that a non-competitive country can experience after trade liberalisation.

In Carnegie's report, the first situation corresponds basically to the situation of China which, according to this study, would reap a third of overall gains from developing countries in the

case of full liberalisation. Whereas the second situation corresponds more to the situation of Sub-Saharan Africa, Bangladesh or South-Asia (excluding India) which will not gain much from trade liberalisation in this simulation.

Together with the choice of scenario, this assumption is key in explaining why most gains come from NAMA liberalisation in Carnegie's study.

2. Perfect land mobility and higher trade elasticities in agriculture inflate the gains in agriculture as measured in the World Bank's study

The World Bank's study is at the other extreme of the range regarding the underlying assumptions in terms of adjustment of production factor markets. In particular, two major assumptions artificially inflate the economic impact of increased agricultural market access compared, for instance, to NAMA: 1/ perfect mobility of production factors across sectors combined with full flexibility in their prices; 2/ higher trade elasticities for agricultural sectors.

- (i) The World Bank's study relies on more "liberal" assumptions and parameters than similar studies regarding the adjustment of domestic economies to trade liberalisation. The study assumes that production factors can immediately adjust to trade liberalisation and move from one sector to another without difficulty and without any economic costs. It means that the study assumes fully flexible economies, in particular fully flexible prices of production factors (labour, capital, land, natural resources). This implies that any increase in exports of industrial products leads to an increase in wages which, in turn, erodes competitiveness based on cheap labour, in which is the case of most DCs. By reducing gradually the cost competitiveness of successful emerging exporters (through increased wages), the model leaves some room for less advanced exporters to get a share of the pie by starting to export in the wake of successful emerging countries. Almost by definition, under these assumptions the gains are more widely spread among DCs than for instance in Carnegie's model.

Theoretically the same mechanism should work in agriculture, however in this case the binding factor is, most of the time, land endowment. As the World Bank's study is based on a very liberal assumption of perfect land mobility across sector (i.e. the ability to grow every kind of crop on every kind of soil), this somewhere relaxes the constraint that land endowment would otherwise represent. It means that every country, except countries with a low ratio of land per capita, can successfully increase its agricultural exports without experiencing a significant increase in land prices. Otherwise, increases in land prices would play the same rebalancing role as wage increases for industrial sectors as explained above.

This asymmetry between the rebalancing mechanisms in the two sectors, industry and agriculture, clearly represents a determining factor in the WB's key result: the concentration of the DDA gains in agricultural market access.

When relaxing the assumption of perfect mobility of land, the DCs' global gains from full liberalization are divided by 5, from \$10.6Bn to \$2Bn. As economic gains linked to NAMA are not much affected by this assumption, this implies that most of the DCs agricultural gains are dependent on the assumption of ability to grow every kind of crop on every kind of soil.

- (ii) "Trade elasticities" measure the variation in trade flows due to cuts in tariffs and are key parameters within these models. In the World Bank's study, they are, on average, 35%

higher than those of other similar models². This artificially inflates the economic impact of increased agricultural market access compared to, for instance, a cut in domestic support. Moreover, the gap between the trade elasticities used in this study and the more widely used model of GTAP, is greater for agricultural products (75%) than for food products (26%) or for other industrial products (11% for textile products; 20% for other industrial products). This clearly inflates the agricultural market access gains in comparison to other parts of the negotiation. When using GTAP elasticities instead of World Bank's elasticities economic gains linked to agricultural market access would be halved while industrial liberalisation gains would be reduced by only 15% and the global gains by 30% (from \$127,4Bn to \$88,5Bn).

(iii) Consequences on the robustness of the results for African countries

As stated before, the World Bank finds a “no-gains-no-loss” outcome for the group of Sub-Saharan countries (excluding South-Africa).

The WB's study does not provide a “sensitivity check” for the central DDA scenario although it does so for the full liberalisation scenario. The comparison of the “full cut scenario” final outcome under different assumptions allows us to draw some important conclusions regarding the role of these assumptions on the overall results for the central DDA scenario for the African countries.

In the full liberalisation scenario, the region called “rest of Sub-Saharan Africa”³ experiences a positive outcome (+\$2.5bn in terms of welfare). Yet, this outcome is reduced by 40% when applied to the current economic size of the region (\$1.4bn). This result changes to a \$600mn loss when using the GTAP elasticities (which leads to a reduction in trade elasticities mostly for agricultural products), and to a \$800mn loss when assuming that land is fixed. Based on these results for the full liberalisation scenario, it is easy to see that the “no-loss-no-gain” result for the central DDA scenario for these countries could well be transformed into a non-negligible overall negative result for those countries with imperfect land mobility and lower trade elasticities.

The assumptions regarding land mobility and trade elasticities for agricultural products are key in this regard. Looking at the detailed results by product, it appears that liberal assumptions regarding these two aspects drive the World Bank to assume very impressive growth of Sub-Saharan Africa exports concentrated in a few agricultural products.

For instance, 2/3 of the overall increase in exports under the DDA scenario from these countries is explained by an increase of sugar exports (+95%, contributing to 36% of the overall increase in their exports) and by an increase of 170% for processed meats (30% of the increase in total exports). For sugar, these results seem at odds with the fact that most of these countries will experience a sharp erosion of tariff preferences for sugar on their main export market (EU). Moreover, highly competitive producers in other parts of the world have huge export capacities and would likely get most of the new opportunities created by an increase of import demand for sugar at the world scale.

The situation is the same for processed meats but, in addition, these products are very much subject to sanitary and phytosanitary standards (SPS) legitimately aimed at protecting consumers or the environment, but which make export difficult for most poor developing countries. This is particularly true for African countries where applying the

² The authors rely on a model long developed in the World Bank (Linkage model) instead of the more widely used GTAP model.

³ That is Sub-Saharan Africa without South Africa.

higher standards in terms of human and environmental protection which developed markets require often appears to be very difficult. It is then a very strong assumption to presume that tariff reduction will lead to a surge in export from a wide range of poor DCs for this type of product. For similar reasons, the 70% increase in dairy product exports foreseen for these countries in the study appears very debatable.

3. More conservative assumptions in both respects (labour market and land mobility) lead CEPII's results to be in the middle of the range regarding overall gains

Both Carnegie and World Bank models' assumptions discussed above could correspond to certain countries' situations. However, both types of assumptions appear too extreme to be considered acceptable to model realistically the consequences of a Doha agreement for the world economy.

Regarding modelling assumptions, CEPII's choice was to place itself more or less in the middle of the range in order to stick to what most economists would consider a rather acceptable representation of economic reality. In addition, these mid-range modelling choices have been made to avoid any extreme or unlikely results which would be difficult to justify or defend.

On one hand and contrary to the WB study, CEPII assumes imperfect mobility of land which means that there is a limited possibility of switching crops on a given land area. On the other hand and contrary to Carnegie's study, there is the possibility of wage adjustment for every kind of labour (skilled and unskilled in agriculture as in other sectors). However, imperfect mobility of unskilled labour across agriculture and industry is assumed. This means that labour adjustments between these two sectors need some years to be fully implemented. This is also the case in the model for capital movements from one sector to another.

As stated before, this set of assumptions put CEPII's model more or less in between the other two models with quite balanced assumptions. Unsurprisingly, this leads to economic estimates in the "middle of the range" in comparison to other studies.

Box 1: Diverging assumptions regarding domestic economies adjustment to trade liberalisation

The variance in choices is particularly evident regarding the way the three studies assume that domestic economies adjust to trade liberalisation. Carnegie's study takes explicitly into account that developing countries are often characterised by high rates of unemployment in urban areas and underemployment in rural areas of unskilled workers. In addition, the labour markets are assumed to be strongly segmented between rural and urban areas. This means that wages can remain very different over a long period between these areas, as migration flows do not immediately allow for a rebalancing of the labour market.

On the contrary, the World Bank considers that production factors (labour, capital, land) can rapidly and perfectly adjust to demand/supply changes linked to trade liberalisation. This implies that wages adjust immediately to variation in production (as do prices and capital returns) and that unemployment is excluded. The same type of hypothesis is assumed by Carnegie's report for developed countries.

This different hypothesis regarding the labour market is key in explaining the gap between the results, as is acknowledged by Carnegie's report. Using unemployment assumptions, gains in real income for developing countries as a group are twice as large while remaining stable for developed countries. Overall, developing countries' share of the global gains from

trade liberalisation is much higher when unemployment is taken into account (45%) than when it isn't (33%).

The gains appear to be more concentrated in the hands of China in the case of unemployment assumption. It reaps half of the developing countries' gains (this proportion rises only slightly) and a quarter of overall gains, against less than 15% [of what?] without this assumption.

The assumption of imperfect reallocation of land between crops is specific to CEPII's study. This explains that, in this model, quite a few countries may find themselves worse off in the case of agriculture liberalisation. This is particularly the case for poor countries such as North and Sub-Saharan Africa. The likely increase in price of their food imports, the erosion of their preferences that they are likely to suffer are hardly compensated in CEPII's model by a strong increase in agricultural production and export because of the constraint placed by the imperfect mobility of land assumption. On top of this, it is assumed that these countries will not make any commitment to reduce their tariffs and, thus, will not benefit from any efficiency gains accruing generally with trade liberalisation. These three effects (negative evolution of relative prices of their imports and exports, preference erosion and absence of efficiency gains) lead to a (slightly) negative outcome for these countries in CEPII's study.

By assuming that all production factor (capital, labour and land) can perfectly adjust to trade liberalisation, World Bank's study corresponds more to long-term economic impacts of trade liberalisation. On the other hand, by assuming certain key economic rigidities, Carnegie's study describes more short-term adjustment costs and gains. By assuming a lesser degree of rigidities, CEPII's study places itself in the mid-term.

2.3. Other gains not factored in by this type of model represent important potential gains, in particular for DCs

While economists have long shown that trade liberalisation exerts a positive effect on productivity through various channels, the kind of model used in the three studies (General Equilibrium models) only take into account some of these channels, and most likely not those which exert the strongest effects.

- These models deal mostly with the effects linked to economies of scale. However, empirical studies on countries such as Colombia or Indonesia have shown that the strongest effect exerted by trade liberalisation is expressed through the entry and the exit of firms: an intensification of foreign competition leads to the exit of the less productive firms while the most productive ones get a larger share of the market. Some newcomers with more efficient production process may enter as well. This type of efficiency effect is acknowledged as the most powerful engine of productivity growth that trade liberalisation can fuel. Unfortunately, general equilibrium models are not yet able to take this type of effect into account in anything more than an ad-hoc manner.
- Efficiency effects on productivity linked to trade opening are very important for poor DCs precisely because the producers of these countries are the most inefficient. By eliminating the less efficient producers and re-attributing, at least to some extent, their market shares to the most efficient domestic producers, trade liberalisation can exert very strong positive effects on productivity in these countries, which represents the real engine of growth⁴.

⁴ See in particular the seminal work of Jacques Melitz and Luis Cabral in this field.

- None of the three models is able to really take into account the effect trade liberalisation exerts on productivity gains. This shortcoming is not crucial regarding the results computed for developed or advanced developing countries as they generally employ the most efficient production techniques for traded goods. This is not the case, however, for the poorest developing countries, as they represent precisely the most inefficient countries in terms of production process. Thus, they are precisely the countries that can benefit the most from productivity gains. As they are very far from using the most efficient methods of production for both goods and services, a small improvement in their efficiency is relatively easier to obtain. At the same time, such effects can have strong impacts on the domestic economy, as they can affect products and sectors which are key inputs for the rest of the economy. In developed countries, some pockets of inefficiency remain, but most of the time they are concentrated in sectors less affected by trade liberalisation (non internationally tradable services for instance). Agriculture and textiles represent the two main exceptions to this general picture in most of the developed world, but their importance in the overall economy is limited.

ANNEXES

World Bank choices regarding the DDA scenarios

- In the different Doha scenarios agricultural market access is characterised by a higher degree of liberalisation and consequently more gains compared to agricultural subsidy cuts.

While the reduction of the Aggregate Measure of Support (AMS) lead to a cut in applied support of less than 20% for the 4 developed countries with highest levels of AMS, the reduction of applied tariffs is no less than 50% for the group of developed countries. This difference in the rate of reduction contributes to the overestimation of the gains from market access in comparison to other negotiating pillars: “the aggregate global welfare consequences are hardly altered if agricultural domestic and export subsidies are not reduced...” (p 361).

- A lower level of ambition for developing countries combined with a very high level of binding overhang for these countries particularly in non-agricultural products drives an underestimation of their interest in NAMA negotiation.

In the Doha scenario defined by Anderson and Martin, the average world reduction of initial applied tariffs is twice as high for agricultural (-35%) as for non-agricultural products (-16%). This corresponds to a 5.3 point cut in the world average applied tariffs in agriculture against a 0.5 point cut for other products. This undoubtedly tends to increase the gains linked to agricultural versus non-agricultural market access.

This difference in the level of tariff cut is explained mainly by the special and differential treatment assumption but also by the major gap between applied and bound tariffs in developing countries, in particular for non-agricultural products. As Anderson and Martin assume a 33% cut in non-agricultural DCs bound tariffs, this is equivalent to almost no cut in their applied protection (from 9,3% to 6,6% for textile products but only from 5,8% to 5,2% for other non-agricultural products, with many of the DCs experiencing no real cut).

- Moreover, Anderson and Martin assume a tiered formula in agriculture which leads to increasing cuts depending on the level of tariff while they assume a proportional cut for non-agricultural tariffs. This effects the outcome of the simulation because economic gains increase more than proportionally with the level of the tariff cut. This means that, while keeping the same average cut, concentrating the tariff cuts on the highest tariffs gives rise to more welfare gains, thus giving more weight to agricultural liberalisation (tiered formula) compared to NAMA (linear reduction).

In summary, the main protected agricultural markets (mainly in developed countries) see their protection sharply cut while the main protected non-agricultural markets (mainly in developing countries) are only slightly affected. In consequence, the gains for developed and developing countries from non-agricultural market liberalisation are clearly understated in comparison to the gains linked to agricultural cuts.

Structural characteristics of such quantitative analysis favour results on agriculture over NAMA

- Accounting for 4% of world GDP, agriculture represents no less than 52% of the economic sectors modelled in the Anderson and Martin study (13 sectors out of a total of 25). This exerts a direct effect on the relative gains attached to agricultural and to NAMA liberalisation by inflating the former.

This inflating effect is linked to the fact that when a sector is highly aggregated (as are industrial sectors in the Anderson and Martin study), the tariff peaks disappear behind the average level of protection. The consequence is to diminish the welfare gains attached to the tariff cuts for such sectors when considering that, as stated before, the gains attached to a tariff cut is more than proportionate to the initial level of protection. A general rule is that the welfare gains are divided by four when the tariff cut is divided by two. As a consequence, to mix very high tariff peaks (for example on finished cars) in a somewhat low average for the sector “automotives and parts” reduces artificially the potential gains of the cut in tariffs for such a sector.

This model structure is not only the result of the choice of World Bank modellers, but also the result of the history of this type of quantitative tools, “General Equilibrium Models”, which have first been developed to simulate agro-food reforms. Because of their origins, the underlying databases have kept a certain focus on agri-food sectors. In these databases, information on the latter sectors is more detailed. This exerts a strong constraint on the ability of modellers to put the emphasis on other sectors. For instance, the service sectors are very little detailed in this type of database and the economic gains of potential liberalisation can thus not be very well assessed.

The Global Trade Analysis Project (GTAP) represents the most widely used database for this type of modelling exercise. This database still puts an emphasis on agriculture (due to historical development), but less so than Anderson and Martin’s choice of aggregation. Agro-food sectors represent 35% of the total number of sectors (20 sectors out of a total of 57). This proportion is 40% in CEPIL’s simulation (14 agro-food sectors up to a total of 35) and 33% in Carnegie’s model (9 agro-food sectors up to a total of 27).

- More than any other sector, agro-food sectors are subject to regulations related to human, animal or plant health (including measures for the protection of the environment; protection of wildlife; protection of plant health; protection of animal health; protection of human health; protection of human safety). A study by ICT-Geneva⁵ shows that 30% of the total world trade affected by this type of measures is in agro-food products. These products are much more subject to this type of non-tariff restrictions than industrial products because of their direct link with human health and environmental concerns. In this respect, tariffs are not the end of the story in the field of agricultural products. Even after a cut in the tariff protection, technical norms and standards can prevent a country from exporting this type of products. This is particularly true for the poorest countries where respecting high developed countries standards in terms of human and environmental protection appears to be often very difficult. It is then a very strong assumption to presume that when tariffs are cut for agricultural products this will lead to a surge in exports from a wide range of DCs. Most probably, only developed countries and a few developing countries, already strong agro-food exporters, would be able to benefit from a better agricultural market access. The majority of poor developing countries would not be able to export because of legitimate SPS or TBT requirements.

⁵ Fontagné L., von Kirchbach F., Mimouni M. (2001), "Une première évaluation des barrières environnementales au commerce international" ITC Research Paper (UNCTAD-WTO) M.DPMD/01/0135 <http://team.univ-paris1.fr/trombi/fontagne/papers/ETB-ITC.pdf>

As agro-food products are mostly subject to this kind of legitimate restrictions, to ignore the question of standards and technical norms tends to inflate the potential increase in agro-food exports in comparison to other sectors.

Box 3: The declining share of agriculture and food in merchandise exports for developing countries

FAO – The State of Food and Agriculture (2005)

Manufacturing exports have risen in importance in high-income countries, with their share in total exports rising from around 70 percent to more than 80 percent during the past two decades. This shift was much more marked in the middle- and low-income countries. In the middle-income group, the share of manufactures in total exports rose from 20 percent to almost 70 percent over the period. In low-income countries, the share of manufactures rose from 20 percent to more than 80 percent. Nor are China and India the only countries driving these changes. Even when China and India are excluded, the rise in the share of manufactures is from 10 percent to more than 60 percent of total exports. Clearly, China and India are important, but much broader changes in the composition of developing-country exports are under way. If we eliminate the disproportionate effects of large exporters altogether, by considering simple average export shares, the average share of manufacturing exports rose from 25 percent to 50 percent in the unweighted low-income country group, and from 28 to 48 percent in the middle-income group. The share of manufacturing exports in total exports has risen sharply in all regions (figure 2.2). In East Asia and the Pacific, the increase began from a high base—over 50 percent—but then increased to almost 90 percent by 2001. In Europe and Central Asia, the manufactures share began at an even higher level, over 60 percent, and rose to almost 90 percent by 2001. Because of Latin America's strong natural resource endowments the situation there was quite different initially, with manufactures contributing only 20 percent of total exports in 1981. That share had almost tripled by 2001—to more than 60 percent. In the Middle East and North Africa, resource exports, particularly oil, remain dominant, although their share fell from more than 90 percent to around 60 percent during the period under scrutiny, while the importance of manufacturing exports rose from close to zero to around 30 percent. In South Asia, manufacturing exports rose from around half of total exports to more than 80 percent. Resource-based exports and agricultural exports remained important in Sub-Saharan Africa, although the share of manufactures rose from 10 to 27 percent overreaching the level of agricultural exports.

Growth in traditional labor-intensive manufactures accounts for only part of the gain in exports of manufactures. Exports of textiles and clothing from low-income countries grew at 14 percent per year between 1981 and 2001, but other commodity groups grew even faster. Exports of electronic products, many of which did not exist in 1980, grew at 21 percent per year—fast enough to double every few years. Further, developing countries expanded their range of markets, with the share of developing country markets growing from 15 to 35 percent over the period.

The rising tide of exports did not lift all boats. Forty three countries had *no increase* on average in their merchandise exports for the 20 years after 1980. Of this group, 20 countries remained strongly dependent on oil or other natural resources, such as phosphates for Nauru or copper for Zambia. Severe conflicts undercut the performance of another 18 countries, including Rwanda and Timor Leste. Trade embargos stifled the export performance of five other countries, including Libya and Sudan. In almost all these countries, the investment climate was not sufficiently favorable—for a range of reasons, sometimes resource depletion, sometimes poor economic management—to attract the investments needed to transform the pattern of exports.

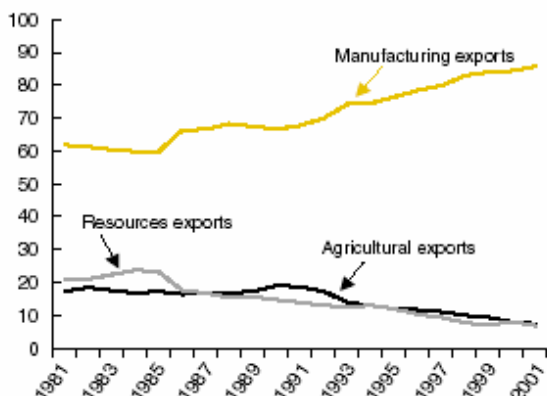
a. Manufactures now make up almost 90 percent of exports from East Asian developing countries

Share of exports by sector, East Asia and Pacific, 1981–2001 (percent)



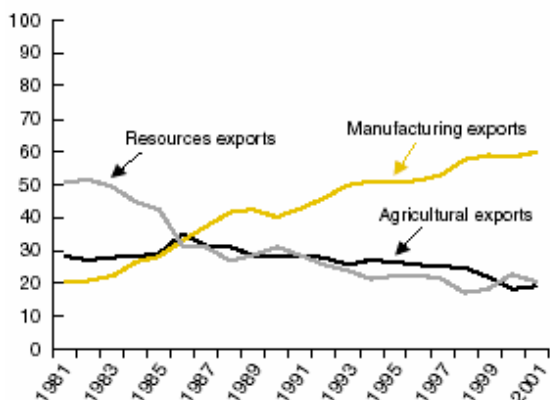
b. The same is true of the developing countries of Europe and Central Asia

Share of exports by sector, Europe and Central Asia, 1981–2001 (percent)



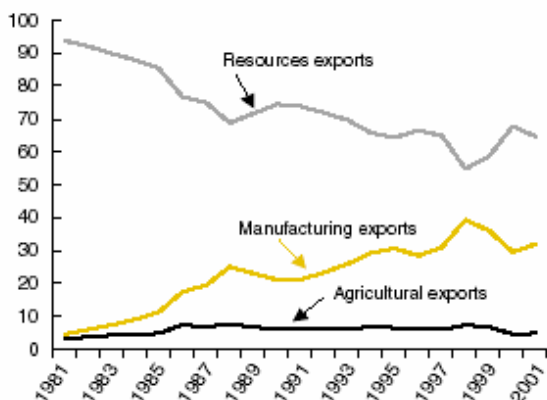
c. The share of manufactures in exports from Latin America and the Caribbean tripled in the last two decades

Share of exports by sector, Latin American and the Caribbean, 1981–2001 (percent)



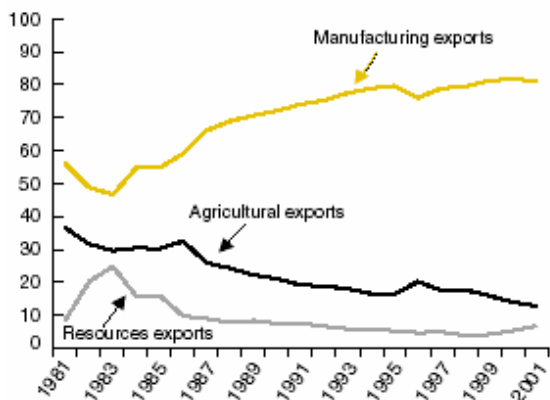
d. Manufactures grew from insignificance in exports from the Middle East and North Africa

Share of exports by sector, Middle East and North Africa, 1981–2001 (percent)



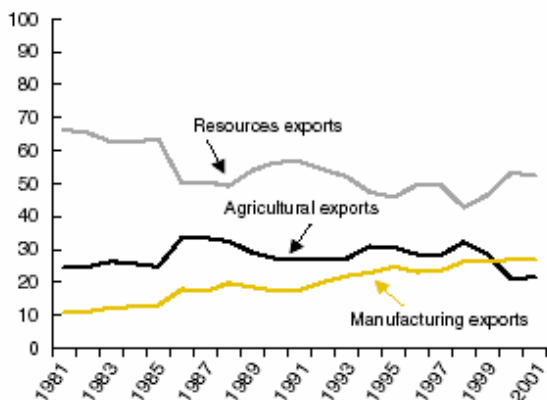
e. Manufactures grew to almost 80 percent of exports from South Asia

Share of exports by sector, South Asia, 1981–2001 (percent)



f. The share of manufactures in exports from Sub-Saharan Africa nearly tripled, but from a low baseline

Share of exports by sector, Sub-Saharan Africa, 1981–2001 (percent)



Source: COMTRADE.