

V. MODELLING THE DOHA ROUND OUTCOME: A CRITICAL VIEW

By Biswajit Dhar

Introduction

In a series of studies published during the past few years, World Bank economists have provided detailed projections by simulating the possible outcomes of the Doha Round negotiations.¹ The projections were obtained by using the LINKAGE Model, which is considered to be a global dynamic computable general equilibrium (CGE) model. The studies relied on the latest version of the LINKAGE Model, LINK6, which uses the Global Trade Analysis Program (GTAP). LINK6 incorporates 87 countries/regions and 57 sectors, and uses a dataset that has been updated up to 2001. This latter feature of the model, according to the authors of the studies, has helped to generate far more realistic results than those that used the earlier versions, which had incorporated data only up to 1997.

This chapter attempts a critical assessment of the above-mentioned studies. Section A presents an analysis of the results by looking at their implications for the developing countries in general and India in particular. Section B broadly alludes to some of the methodological problems that are associated with CGE models of the LINKAGE genre. The contention of the author is that the limitations of these models, especially in terms of the assumptions on which they are based, deserve close scrutiny and that this dimension needs to be kept in view as the results obtained from studies are read.

Section C comments on an important facet of this genre of studies, which is their emphasis on unbridled trade liberalization involving agricultural products. This facet ignores the fact that the developing countries have been arguing that they need to address their critical concerns regarding food security and livelihood while agreeing to the eventual Doha Round package. Most of the major developing countries are in agreement that products that meet their food security needs, and which support sizeable numbers of agricultural producers, should be granted higher levels of protection. The so-called Special Products (SPs), along with a Special Safeguard Mechanism (SSM), are the essential elements of the proposals tabled by these countries.² Section D presents a summary of the points highlighted by this chapter.

¹ The most quoted of these papers are by Kym Anderson, Will Martin and Dominique van der Mensbrugge (2005 and 2006).

² The G33 group of developing countries took the lead in proposing that SPs and an SSM should be included in the new agriculture deal. Subsequently, the G20 group also lent its support to the G33 proposal.

A. Analysis of the results

The LINKAGE model provides a baseline projection of the world economy, first up to 2005 and then up to 2015, assuming there are no other policy changes. Deviations from that baseline in 2015, due to total liberalization from 2005, are then examined.³ The simulations for 2015 are based on alternative scenarios of trade liberalization emerging from the current round of multilateral trade negotiations. The results have been presented based on two sets of assumptions. The first assumes full liberalization of global merchandise trade. The projections relying on this assumption are worked out on the basis of a new source for protection data, which integrates trade preferences, specific tariffs and a partial evaluation of non-tariff barriers (NTBs).

Inclusion of NTBs in the CGE models has been one of the less satisfactory aspects. This stems from the fact that attempts made thus far to quantify the impact of NTBs has not been fully satisfactory. While the database on non-tariff measures that has been developed by UNCTAD, viz. the TRAINS database, is fraught with limitations ranging from incomplete coverage⁴ to problems related to the measurement of their differential impacts on countries,⁵ the Market Access Map (MAcMap) database that has been developed by ITC together with CEPII (Paris) includes only tariff quotas in its database. Considering that NTBs (i.e., standards and others) are assuming increasing importance in a world where tariffs are steadily declining, this limitation of LINK6 needs to be highlighted.

The second set of results is based on some of the key proposals for agricultural trade reforms that are being actively discussed in the ongoing negotiations. The simulations take into consideration the proposals for tariff cuts together with those for treating some of the tariff lines as “sensitive” or “special products”. What needs particular mention here is that none of the results of the two sets takes cognizance of the subsidy dimension, which, without doubt, holds the key to realizing the objective of a distortion-free market for agricultural commodities.

1. Full liberalization of global merchandise trade

The first major set of results that is reported in the above-mentioned papers pertains to the effect of the ongoing trade liberalization efforts on the real income up until 2015. These estimates have been made against the benchmark that assumes a complete freeing of merchandise trade during 2005-2010. It has been reported that real income gains by 2015 for the global economy as a whole would be US\$ 287.3 billion per year. Of this

³ Anderson and others (2005).

⁴ For most countries, the TRAINS database covers NTBs until the end of the 1990s. In the case of India, the NTB data are provided up to 1997, which is even before the removal of quantitative restrictions (QRs) that India was maintaining for balance of payments purposes.

⁵ For instance, exporters from LDCs and developing countries endowed with a relatively low level of technical skills would find it very difficult to conform to a technical barrier imposed by a developed country. However, the same may not be true for other countries.

increase, the share of the developed countries would be US\$ 201.6 billion while for the developing countries the gains would be US\$ 85.7 billion. In other words, the share of the developing countries in the total gains would be a third of the total global gains. More importantly, real income gains reported for the developing countries would be 0.8 per cent of the baseline income in 2015, which is marginally higher than the corresponding figure for the developed countries (0.6 per cent). Among the developing countries, the relatively prosperous Latin American region is expected to register real income of 1 per cent of the baseline income in 2015 while for the South Asian region the corresponding figure is only 0.4 per cent.

These broad results lend themselves to two varying interpretations. The first, which has been provided in the studies, is that the results are significantly favourable for the developing countries since their expected real income gains are considerably larger than their existing share in global production. Thus, while the developing countries as a whole account for a quarter of global production at present, they would be able to enjoy a third of the global gains in real income that is expected annually until 2015. An alternate view is that what the results are pointing to is the increasing gulf between the relatively prosperous and poorer countries. In overall terms, it can be said that the disproportionately large gains for the developed countries that the studies under discussion have predicted would reinforce the status of the lesser players in the global economy as “developing” even after the so-called “development round” has been implemented. What is more, the results point to increasing differentiation between the developing countries, as the more prosperous regions are slated to record relatively larger increases in real income.

The disaggregated results provided for a small set of countries broadly reinforce the above-mentioned conclusions. India is expected to register a real income gain of only US\$ 3.4 billion a year, which is 0.4 per cent of the baseline income in 2015. In the case of China, the corresponding figures are US\$ 5.6 billion and 0.2 per cent, respectively. On the other hand, countries such as Thailand are expected to gain US\$ 7.7 billion while for Argentina, the real income gain could be nearly US\$ 5 billion (see annex table 1 for details).

From the point of view of developing countries, the expected movements in the terms of trade provide the most disquieting numbers for this set of results. In what are considered as pioneering studies, Raul Prebisch (1960) and Hans Singer (1950) pointed out that developing countries, as exporters of primary commodities, faced deteriorating terms of trade while trading with the exporters of manufactured goods, viz., the industrialized countries.⁶ Subsequently, many studies have argued that for most of the past six decades, the terms of trade deterioration has been a major malaise for the developing countries. In fact, past studies had indicated that the developing countries would not have suffered the ignominy of the debt crisis if they had not experienced deterioration in their terms of trade. In their attempt to maintain their past levels of United States dollar earnings in the face of

⁶ For a more recent rendering of the issues involved, see United Nations Conference on Trade and Development (2005).

the deteriorating terms of trade, developing countries have only encouraged the development of unsustainable production structures that could have serious medium- to long-term implications for their non-tradeables, particularly labour and the environment.

The results provided by the LINKAGE Model show that the developing countries as a whole would suffer significant losses as a result of the changes in the terms of trade. The total loss that those countries are expected to suffer is expected to be nearly US\$ 30 billion per year. This sharply contrasts with the projection for the high-income countries, which should expect more than US\$ 30 billion gains annually from the terms of trade changes alone.

Among the developing country groupings, the projected changes in the terms of trade bring benefit only to the Latin American region. The South Asian region would suffer the largest losses on this account, amounting to more than US\$ 11 billion per year, and most of those losses would be because of the US\$ 9.4 billion losses that India is projected to suffer annually.⁷ The results show that India and China would suffer the largest losses arising from the movements in the terms of trade. This implies that for the two emerging economies the projected gains in real income would come at a considerable price in terms of domestic resource use.

The gains from full liberalization of global merchandise trade, as estimated by the LINKAGE Model, occur largely due to the liberalization of the agriculture and food sectors. Almost two-thirds of the global gains are due to agricultural trade liberalization and are expected mainly because high-income countries would liberalize their agriculture sector. While these results are more along the expected lines, the disaggregated results that capture the impact of full global trade liberalization on agricultural and food output as well as trade, should raise plenty of heckles in many low-income developing countries, including India.

According to the results provided by the LINKAGE Model, global trade liberalization would significantly squeeze global agricultural output by 2015. Agricultural output should decrease by almost US\$ 138 billion per year relative to the baseline. The members of the European Union would experience a sharp downturn in their output, as would also be the case for Japan. From among the group of developing countries, India and China are expected to face declines in agricultural output; in the case of the former country, the decline is expected to be much larger in absolute terms. However, the group of agricultural exporters (the Cairns group countries) are likely to have a vastly different experience. Two of the major countries in this group, i.e., Brazil and Argentina, are expected to find their agricultural output increasing annually by US\$ 66 billion and US\$ 12 billion, respectively. Some of the South-East Asian countries are also expected to register gains, albeit relatively small amounts. However, while Brazil and Argentina are projected to make a collective gain of more than US\$ 76 billion a year, the gains for the developing countries as a whole

⁷ The losses that India would suffer because of adverse terms of trade would be nearly three times its real income gains following from the full liberalization of global merchandise trade.

are put at US\$ 67 billion. Quite obviously, therefore, some countries in the developing world are expected to suffer significant losses, and this group of countries is headed by India. The projected annual losses for India are projected to be of the order of US\$ 24 billion per year, which is a 4 per cent decline in relation to the baseline. Together with India, China is also expected to be a loser, but of a much smaller magnitude (US\$ 10 billion per year).

The projections made by LINK6 about the winners and losers in the agriculture sector following from the global trade liberalization have yet another significant dimension, in that the distribution of gains within the developing world is expected to be highly skewed. Thus, while the middle-income countries are expected to register annual increases of more than US\$ 88 billion a year, the low-income countries are expected to suffer annual losses of more than US\$ 21 billion. These results have serious longer-term implications since the projected losers in the developing world will be those countries that are significantly dependent on the agricultural sector as a source of livelihood for a majority of their populations. What the World Bank is therefore trying to tell us is that the agricultural sector in developing countries such as India, which is already feeling a tremendous squeeze, could suffer further as full global trade liberalization takes effect.

In regard to trade in agricultural products, the projections provided by LINK6 have a few surprises. China is shown to be emerging as a major exporter of agricultural products, with a likely export growth of nearly 146 per cent over the baseline. In comparison, China's import growth is expected to be a modest 27 per cent. India is expected to register a tremendous increase in agricultural imports – in excess of 165 per cent over the baseline. However, India's exports of agricultural commodities would increase by a relatively modest 53 per cent. These figures do not bode well for a country that is expecting to improve its presence in the global market for agricultural commodities once the prevailing policy distortions are substantially eliminated at the end of the current round of negotiations.

An interesting facet of the results on the emerging scenario in agricultural trade is that some of the agricultural exporters in the South-East Asian countries are not expected to do as well. For example, Thailand should expect a large import surge but only modest gains in exports by 2015.

For most developing countries, the objectives of food security and protection of livelihoods remains of paramount importance in the current round of multilateral trade negotiations. Food security, as is commonly understood, is the access to food at all times and at prices that are affordable. Thus, individual countries can ensure realization of the objective of food security by removing uncertainties in supplies and by having a reasonable control over the prices of the commodities forming the food basket. It may be argued that these twin objectives can at once be realized primarily by promoting local production of foodgrains. Furthermore, encouragement of the local production systems in developing countries would be the *sine qua non* for addressing the issue of livelihood security in the rural areas.

The question of whether or not developing countries would be able to address their food security concerns by promoting their domestic production systems has been addressed in the studies under discussion here. However, these results suffer from at least two sets of limitations. First, the results have been presented in terms of the broad groups of countries, with the exception of China. Second, the results for developing countries have been captured via regional groups, but not all regional groups have been included in the tables.

The results indicate that while the developing countries as a whole would be fully self-sufficient⁸ in respect of food and agricultural products following full global liberalization of merchandise trade, the developed countries would increase their dependence on the global markets for these products. As for the regional groups of developing countries, the Latin American countries would improve their position as net suppliers to the global market, as would the countries of sub-Saharan Africa. At the same time, however, the South Asian countries would face deterioration in their self-sufficiency ratio and, in case of China, full liberalization of global merchandise trade leaves the self-sufficiency ratio unaltered.⁹ It should be pointed out that the projected deterioration in the self-sufficiency ratio in food and agriculture products for the South Asian region is a result of the large imbalance between the growth of imports and exports that has been estimated for India. As indicated above, LINK6 has estimated a large increase in India's import volumes together with a relatively modest increase in exports in the aftermath of full trade liberalization.

The foregoing discussion shows quite clearly that the claims of a win-win situation arising from the full liberalization of merchandise trade, which the World Bank has never ceased to make, have been challenged by World Bank-supported studies. The results indicate that liberalization of merchandise trade would lead to greater inequities in the global economy, much of which would be reflected in the realm of trade. The inequities would not just be between the developed and the developing countries, but even between developing countries. Thus, while the relatively advanced countries in the Latin American, East Asian and South-East Asian regions are expected to perform much better, the low-income countries, particularly those in the South Asian region, would be confirmed as the laggards. The studies also point to a sharp deterioration in the terms of trade of a large majority of developing countries, which could take place in the aftermath of the liberalization episode. Changes in the terms of trade faced by the developing countries and their implications have not been given much importance in the current discourse, but it is the author's view that countries suffering from the adverse terms of trade movements need to remember the seminal contributions of Prebisch, Singer and other scholars to making us understand the inimical consequences of this phenomenon.

⁸ Defined as domestic production as a percentage of domestic consumption.

⁹ The results predict a 91 per cent self-sufficiency ratio for China. This conclusion needs to be seen in the context of an earlier World Bank study that predicted China could attain a self-sufficiency ratio of 90 per cent in cereals, but only if it made substantial investments in bolstering agricultural productivity. See World Bank (1997).

What is particularly significant is the fact that the liberalization of merchandise trade is likely to have deleterious consequences for the agricultural sector of the South Asian region. In this context, results provided for India stand out. The results indicate a decline in India's agricultural output; as a logical corollary, India is expected to end up increasing its imports by a wide margin. The results thus portend a major crisis that India, and some of the other low-income countries, would face should full liberalization of merchandise trade take place.

The second set of results provides simulations using various proposals in the realm of market access that are currently being discussed as a part of the Doha Round of multilateral trade negotiations. The following discussion brings out the key features of the results.

2. Doha Round scenarios

Based on the proposals that are on the negotiating table, eight scenarios have been provided for working out the possible outcome the Doha Round:

- (a) Scenario 1 – Tariff reduction using the tiered formula with three rates of reduction for developed countries (45, 70 and 75 per cent), four for developing countries (35, 40, 50 and 60 per cent) and no reduction for least developed countries (LDCs).
- (b) Scenario 2 – Inclusion of “sensitive” products in scenario 1 with developed countries being allowed to treat 2 per cent of their HS six-digit tariff lines as “sensitive”, which would be subjected to tariff reduction of 15 per cent. Developing countries and LDCs allowed 4 per cent of HS six-digit tariff lines as “special” products.
- (c) Scenario 3 – Inclusion of “sensitive” products in scenario 1 with developed countries being allowed to treat 5 per cent of their HS six-digit tariff lines as “sensitive”, which would be subject to tariff reduction of 15 per cent. Developing countries and LDCs allowed 10 per cent of HS six- digit tariff lines as “special” products.
- (d) Scenario 4 – A proportional cut in tariffs that brings about the same reduction in average agricultural tariffs in developed countries as a group (44 per cent) and developing countries as a group (21 per cent), as would be the case by using the tiered formula.
- (e) Scenario 5 – Includes in scenario 4, 2 per cent “sensitive” products for developed countries and 4 per cent “sensitive” and “special” products for developing countries. As a result, the average tariff reduction would be 16 per cent for developed countries and 9 per cent for developing countries.
- (f) Scenario 6 – Adds to scenario 5 a tariff cap of 200 per cent – resultant average cuts in agricultural tariffs, 18 per cent

- (g) Scenario 7 – Includes in scenario 1 cuts in non-agricultural tariff bindings of 50 per cent to be effected by developed countries, 33 per cent by developing countries and none by LDCs.
- (h) Scenario 8 – Developing countries and LDCs take the same level of cuts in bound tariffs on non-agricultural products as do the developed countries in scenario 7.

The results obtained under each of these scenarios have some interesting dimensions. The largest gains in real income for all countries and country groupings would be made only when the parallelism between tariff reductions in agricultural and non-agricultural products becomes a reality.¹⁰ At the other extreme, are the results obtained under scenario 3, which provides for the inclusion of “sensitive” and “special” in the mode. The results show a decline in the real income for developing countries as a whole, with only gains for the developed countries. Therefore, the studies under discussion are predicting that developing countries would be worse off by taking recourse to the special and differential treatment.

The major results presented for the various Doha Round scenarios need to be critically evaluated as they appear to be militating against the position that the developing countries have taken during the negotiations. Based on their assessment of the impact of trade liberalization on their economies, developing countries have argued that gradualism must be accepted as the universal basis for liberalization efforts that are under way in the current Round. This principle has been emphasized particularly in the area of agriculture, where concerns for the small and marginal farmers and their lack of staying power in the market, in the face of competition from agro-business, have been raised. What has lent strength to their arguments is the fact that in several developing countries, the “big bang” liberalization episodes involving the agriculture sector have had inimical consequences for production and employment in the sector.¹¹

It may be pointed out that the results presented in the studies do not capture the objective reality because of the inherent limitations of the methodology of the model employed. In the past few years, critics have pointed to the methodological shortcomings of the CGE framework upon which the LINKAGE Model is based. As is briefly indicated in the next section, the assumptions upon which the LINKAGE Model is based are either unrealistic in nature or are far removed from the conditions that exist in the developing world. It must be mentioned that the limitations alluded to here are intrinsic to the

¹⁰ The implications of this finding should be considered carefully in the light of the Hong Kong Ministerial Declaration, which, in paragraph 24, instructed the “negotiators to ensure that there is a comparably high level of ambition in market access for agriculture and NAMA”. Although the Declaration added that “[t]his ambition is to be achieved in a balanced and proportionate manner consistent with the principle of special and differential treatment”, the findings of the studies in question suggest that developing countries would be better off by foregoing their S&D options.

¹¹ Dhar (2005) gives an account of the experiences of some of the South-East Asian countries in this regard.

LINKAGE Model; in other words, whatever “improved” versions of the present studies that the authors may subsequently present to us, the results would still remain debatable.

B. Methodological limitations of the LINKAGE Model

In a persuasive article, Ackerman (1999) has given us plenty to think about with regard to the structural limitations of the CGE framework. The general equilibrium theory bases itself on the two Arrow-Debreu theorems developed in the 1950s. The first postulates that assuming the existence of a competitive market economy, any market equilibrium would be Pareto optimum. The second theorem stipulates that under certain conditions, every Pareto optimum is a market equilibrium given some initial conditions. There has been considerable debate centring on the Arrow-Debreu framework, the nub of which is the realism of some of the assumptions. Ackerman, for example, points out that the assumptions such as increasing returns to scale are a common occurrence, but if this fact is incorporated in the theory, the existence of equilibrium is no longer certain. This would, in other words, imply that a Pareto optimum need not be market equilibrium.

The major problem with the CGE models, as has been commented upon by several of its critics, stems from the rather limited set of assumptions on which they are based. These models are primarily market simulation models incorporating idealistic behaviour of producers and consumers across markets and determining equilibrium, market-clearing prices and quantities. The limitation of considering the ideal types could lead to problems of aggregation, as aggregate demand, for example, may not be as well-behaved as individual demand. Micro-foundations of macroeconomics can, therefore, be fraught with imponderables.

This general discussion sets the stage for looking at some of the specifications that have been used to define the LINKAGE Model. As indicated briefly, some of the assumptions on which the model is based do not even remotely capture the reality, particularly in the developing countries. Some of the assumptions made in the model are that:

- (a) “All sectors are assumed to operate under cost optimization”. This assumption assumes away market imperfections that may not allow producers to manage their operations for ensuring “cost optimization”.
- (b) “Three different production archetypes are defined in the model – crops, livestock and all other goods and services. Sectors are differentiated by different input combinations and substitution elasticities within each one of the main production archetypes”. Clearly, the problem of aggregation, as was alluded to above, would occur because of this assumption. This problem would appear in a more acute manner in the case of a country such as India, which has an extremely diversified agricultural sector.
- (c) “The key feature of the crop production structure is the substitution between intensive cropping versus extensive cropping, i.e., between fertilizer and land”. This assumption assumes away the production rigidities that exist in the agricultural sector of the developing countries. An overwhelmingly large

proportion of the farm population has virtually no choice, in so far as changing the nature of crop production. Change in the relative prices of fertilizers and land could not, therefore, lead to any change in the production structure.

- (d) "Land is assumed to be partially mobile across agricultural sectors". Refer to the comment made in respect of assumption (c).
- (e) "Each national economy is divided into two distinct geographic zones [that] define potentially separate labour markets. A single elasticity ... determines the nature of the labour market". Labour markets are far from the ideal type that is assumed for the purposes of the model in question. In particular, the assumption of "a single elasticity" does not at all capture the complexities of the labour market as it exists in developing countries.

The above-mentioned examples of assumptions made in the LINKAGE Model unerringly point to the need for interpreting the results with some degree of caution.

It does appear that some of the leading advocates of the CGE models are quite aware of the limitations when they suggest that the results of the models should be undergo the test of validation with observations from the real world, which they have tried to capture. It has been argued that such cross-checking "has to allow for the fact that the projections from an AGE (applied general equilibrium) are conditional in that they are based on particular assumptions about values of variables exogenous to the model, and, as such, the projections could deviate from the actual outcomes if the realized values of exogenous variables differed from the assumed values". It has been further surmised that in "actual implementation, aspects of policy could differ from their assumed values".¹² Thus, while some of the foremost protagonists of the CGE models have suggested that the results of the models should be considered after examining their validity with the real world, the authors of the studies under discussion have presented their results in such a manner that the decision makers should treat them as absolute benchmarks. In this context, it needs to be pointed out that even during the Uruguay Round negotiations, a plethora of studies, again using the CGE models, projected significant gains for the developing countries that turned out to be no more than a chimera.¹³ Several developing countries had, in fact, made extensive commitments hoping for the gains that the studies had projected; however, only two years after the implementation of the Uruguay Round package had begun, they were forced to bring to the fore the fact that the anticipated gains had not materialized.¹⁴

Further corroboration was provided recently of the point that the recommendations made by the genre of studies referred to above are unlikely to benefit the developing countries. A study by Maros Ivanic and Will Martin (2006) on "Potential implications of

¹² Kehoe, Srinivasan and Whalley (2005).

¹³ See, for example, Goldin and Mensbrugghe (1993).

¹⁴ These issues were first raised by developing countries as the so-called "implementation issues" in the Second Ministerial Conference held in Geneva in 1998.

agricultural special products for poverty in low-income countries”¹⁵ provided an expansive analysis of how poverty in developing countries would increase if those countries relied on the instrument of SPs, which, according to the G20 and the G33 countries, must form a central pillar of the outcome of the Doha Round negotiations on agriculture. However, as indicated in the following section, the exposition of Ivanic and Martin is based on a flawed understanding of the bases on which the G20 and G33 countries have argued for the recognition of SPs.

C. Inadequate understanding of the critical concerns of developing countries

Although from the title of the paper it would appear that they are addressing the problems of poverty at the economy-wide level, the authors are effectively focusing on urban poverty for arriving at most of their conclusions. Thus, the authors surmise that poverty would increase because protection granted to the SPs would increase prices of staples and would hence affect the marginalised sections of the urban population. This conclusion is based on an inappropriate methodology for selecting the SPs. The authors use only a few elements of the criteria proposed by the G33, which helps them to assume that SPs would only comprise staples. They fail to recognize that list of SPs would also include non-food commodities that are significant from the point of view of safeguarding livelihoods, besides contributing to rural development. These two criteria are extremely important, as they could provide the much needed policy space for the developing countries to improve the fortunes of their rural economy.

In putting forth their strong arguments against the use of SPs, the authors seem to be unaware that one of the major causes of growing urban poverty in most developing countries is the fact that the rural sector in those countries has faced relative neglect; in other words, there has been a bias against this sector in the overall development priorities. With the rural sector failing to create increased employment opportunities due to this policy bias, the urban centres appear to have provided the much needed window of opportunities for the rural population. However, the resultant large-scale migration has eventually swelled the ranks of the marginalized sections in the urban areas. For the developing countries, therefore, development of the rural economy – which includes above all the improvement in the income-generating capacities of agriculture – is of utmost priority. Many of these countries have argued in the ongoing negotiations on agriculture that the “development dimension” must be recognized by granting the much needed policy space for the developing countries to pursue the right set of policies, one that removes the policy bias against the agricultural sector. The key to the pursuit of this objective, in the view of the G20 and the G33, is the mechanism of SPs.

¹⁵ The comments are based on a version of the paper dated 16 October 2006. Subsequently, however, the World Bank withdrew the paper in the face of critical comments. On 24 January 2007, Francois J. Bourguignon, World Bank Chief Economist, issued a statement saying that the final paper would be posted on the World Bank’s research page “when the research is complete and it has gone through the standard review processes”.

The inadequate understanding of the authors is also reflected in their comments that increased protection from the use of SPs “effect poverty through three broad channels”. The first is the “effect of commodity prices and wages on incomes in the short term”. While the authors are concerned about the detrimental effect of commodity price rise on the urban consumers, most developing countries would like to use the SPs to influence commodity prices and wages so as to benefit the farm households. It may be argued that the main reason for using the instrument of SPs is to ensure reversal of the secular decline in commodity prices, in particular prices of commodities that are critical for providing livelihood security for farm households. In the past decades, low commodity prices have reduced the farmers in developing countries to marginalized existence and this situation can get far worse if the subsidized commodities are allowed to enter the developing country markets for “promoting” trade.

According to Ivanic and Martin (2006), the second adverse effect of protecting SPs would be that resources would be “diverted away from the activities that yield the highest social returns into those that generate the highest market returns at distorted prices”. It is argued here that the purpose of the SPs is precisely to divert resources into the agriculture, since this would yield the highest social return in the medium to the long term. As indicated earlier, the policy bias against agriculture had militated against the flow of resources into the sector that supports around two-thirds of the workforce in India. This policy bias can be set right by providing adequate protection to the products that are sensitive in nature by using the mechanism of SPs. There is absolutely no case for lowering protection to products that are identified as SPs by promoting inefficient producers who can take advantage of the distorted prices in the markets for agricultural commodities.

The third concern of the authors that SPs would result in diverting resources away from “export-oriented activities towards import replacement”, causing productivity to fall, again exposes their limited understanding of economic realities. Contrary to their understanding that the SPs are to be viewed from the trade perspective, developing countries have argued that this instrument would ensure the realization of food security and protection of livelihoods, which stand out among the major objectives of development policy. These countries have frequently argued that that the twin objectives of food security and livelihoods protection should be viewed as non-trade concerns.

The issue of food security has been identified as a major objective to be pursued by the global community by the Rome Declaration on World Food Security and the World Food Summit Plan of Action in 1996. The Summit emphasized that food security exists when “all people at all times, have physical and economic access to sufficient, safe and nutritious food to meet their dietary needs and food preferences for an active and healthy life”. The Rome Declaration took into consideration the multifaceted character of food security, and emphasized that “concerted national action and effective international efforts” were needed to “supplement and reinforce national action.”¹⁶ The Plan of Action adopted

¹⁶ Food and Agriculture Organization of the United Nations, Report of the World Food Summit, 13-17 November 1996 (WFS 96/REP), part one, appendix.

by the World Food Summit proposed that “each nation must adopt a strategy consistent with its resources and capacities to achieve its individual goals and, at the same time, cooperate regionally and internationally in order to organize collective solutions to global issues of food security.” Besides emphasizing the importance of national policies, the Rome Declaration and the Plan of Action presented an interesting perspective on the role of trade in the pursuit of food security. The participating countries expressed their commitment to “strive to ensure that food, agricultural trade and overall trade policies are conducive to fostering food security for all through a fair and market-oriented world trade system.” Thus, quite contrary to the view that imperatives of trade should be given primacy, as is the underlying theme of the Ivanic and Martin paper, the World Food Summit had emphasized that food security should be the primary concern of the global community.

D. Conclusions

This chapter provides a critical view of the studies based on the LINKAGE Model, a variant of the CGE models, which have projected the possible outcomes of the Doha Round of multilateral trade negotiations. These studies have provided detailed estimates of the likely gains/losses for individual countries/groups of countries in 2015, and the projected end-date for the implementation of the commitments that WTO member States would take at the end of the current round of negotiations.

The aggregative results presented in the studies indicate that of the annual gains in real income that would result from full liberalization of merchandise trade in all WTO member States, the share of the developing countries would be one-third. According to the authors of the studies in question, developing countries should consider the projected gains as a favourable outcome, since their current share in global production is around 25 per cent of the total. However, what these results also imply is that the wedge between the developed and the developing countries would get wider following a disproportionately large increase in the gains for the former.

The detailed results for individual countries/groups of countries only provide more evidence of a widening gap between the more prosperous and the less prosperous regions of the world. In the developing world, the likely gainers are the more advanced middle-income countries, while the low-income countries, including India, would not fare well. The more disturbing of the results is the projected deterioration of the terms of trade, particularly in countries such as India and China, in the aftermath of full liberalization of global merchandise trade. This chapter has attempted to argue that it is these detailed results, rather than the aggregative numbers, that need to be looked at carefully.

An attempt has also been made to indicate that there is a more fundamental problem with these studies. The CGE models are based on assumptions whose veracity is questionable, particularly in the case of developing countries. In addition, as expected, the models are considerably at odds with the reality in the developing countries.

It is pertinent to note here that some of the leading advocates for the CGE models have opined that the results obtained from the models must be cross-checked with real-life conditions in order to ascertain their reliability. Such an exercise is, of course, impossible in respect of the results that the studies in question have provided. However, what should be pointed out is that CGE models of an earlier generation projected substantial gains for the developing countries following on from the implementation of the Uruguay Round package. It would have been more appropriate if the authors of the papers under discussion had presented their results against the backdrop of the past frailties of their models.

References

- Ackerman, F., 1999. "Still dead after all these years: Interpreting the failure of General Equilibrium Theory", Global Development and Environment Institute Working Paper No. 00-01, Tufts University (available at: <http://ase.tufts.edu/gdae>).
- Anderson, K., W. Martin and D. van der Mensbrugghe, 2006. "Market and Welfare Implications of Doha Reform Scenarios", in K. Anderson and W. Martin (eds.), *Agricultural Trade Reform and the Doha Development Agenda*, London, Palgrave Macmillan, and Washington, D.C., World Bank (available at: http://siteresources.worldbank.org/INTRANETTRADE/Resources/239054-1109114763805/Ch12_AndersonMartinMensbrugghe.pdf).
- _____, 2005. "Distortions to world trade: Impacts on agricultural markets and farm incomes", CIES Discussion Paper 0519, University of Adelaide.
- Dhar, B., 2005. "Liberalization in agricultural trade: Issues and concerns", paper presented at the joint United Nations Economic and Social Commission for Asia and the Pacific and International Trade Centre Seminar on "Delivering on the WTO Round: a High-level Government-Business Dialogue for Development", 4-6 October 2005; reprinted in *Studies in Trade and Investment*, No. 56, ESCAP.
- Goldin, I. and D. van der Mensbrugghe, 1993. *Trade Liberalisation: What's At Stake?* Development Centre, Organisation for Economic Co-operation and Development, Policy Brief No. 5.
- Ivanic, M. and W. Martin, 2006. "Potential implications of agricultural Special Products for poverty in low-income countries", World Bank (mimeograph). (See footnote 15.)
- Kehoe, T., T.N. Srinivasan and J. Whalley (eds.), 2005. *Frontiers in Applied General Equilibrium Modelling: In honour of Herbert Scarf*, Cambridge University Press.
- Prebisch, R., 1960. "The economic development of Latin America and its principal problem", New York.
- Singer, Hans W., 1950. "The distribution of gains between investing and borrowing countries", *American Economic Review*, vol. XL (May), pp. 473-485.
- United Nations Conference on Trade and Development, 2005. "Trade and Development Report", Geneva.
- van der Mensbrugghe, D., 2004. "LINKAGE technical reference document: Version 6.0", (mimeograph), World Bank, Washington, D.C. (available at: <http://siteresources.worldbank.org/INTPROSPECTS/Resources/334934-1100792545130/LinkageTechNote.pdf>).
- World Bank, 1997. "At China's table: Food security options", Washington, D.C.

Annex

Annex table 1. Impacts on real income from full liberalization of global merchandise trade, by country/region, 2015

(Relative to the baseline, in 2001 US\$)			
Country/region	Real income gain (US\$ billion)	Gain due just to change in terms of trade (US\$ billion)	As percentage of baseline income in 2015
Australia and New Zealand	6.1	3.5	1.0
EU25 and EFTA	65.2	0.5	0.6
United States of America	16.2	10.7	0.1
Canada	3.8	-0.3	0.4
Japan	54.6	7.5	1.1
Republic of Korea and Taiwan Province of China	44.6	0.4	3.5
Singapore and Hong Kong, China	11.2	7.9	2.6
Argentina	4.9	1.2	1.2
Bangladesh	0.1	-1.1	0.2
Brazil	9.9	4.6	1.5
China	5.6	-8.3	0.2
India	3.4	-9.4	0.4
Indonesia	1.9	0.2	0.7
Thailand	7.7	0.7	3.8
Viet Nam	3.0	-0.2	5.2
Russian Federation	2.7	-2.7	0.6
Mexico	3.6	-3.6	0.4
South Africa	1.3	0.0	0.9
Turkey	3.3	0.2	1.3
Rest of South Asia	1.0	-0.8	0.5
Rest of East Asia	5.3	-0.9	1.9
Rest of Latin America and Caribbean	10.3	0.0	1.2
Rest of ECA	1.0	-1.6	0.3
Middle East and North Africa	14.0	-6.4	1.2
Selected sub-Saharan Africa	1.0	0.5	1.5
Rest of sub-Saharan Africa	2.5	-2.3	1.1
Rest of world	3.4	0.1	1.5
High-income countries	201.6	30.3	0.6
Developing countries – WTO definition	141.5	-21.4	1.2
Developing countries	85.7	-29.7	0.8

Annex table 1 (continued)

(Relative to the baseline, in 2001 US\$)			
Country/region	Real income gain (US\$ billion)	Gain due just to change in terms of trade (US\$ billion)	As percentage of baseline income in 2015
Middle-income countries	69.5	-16.7	0.8
Low-income countries	16.2	-12.9	0.8
East Asia and the Pacific	23.5	-8.5	0.7
South Asia	4.5	-11.2	0.4
Europe and Central Asia	7.0	-4.0	0.7
Middle East and North Africa	14.0	-6.4	1.2
Sub-Saharan Africa	4.8	-1.8	1.1
Latin America and the Caribbean	28.7	2.2	1.0
World total	287.3	0.6	0.7

Source: Anderson and others (2006).

Annex table 2. Regional and sectoral source of gains from full liberalization of global merchandise trade, developing and high-income countries, 2015

(Relative to baseline scenario)*						
Countries/regions	Gains by region in US\$ billion			Percentage of global gain		
	Developing	High income	World	Developing	High income	World
Developing countries						
Agriculture, food	28	19	47	33	9	17
Textiles, clothing	9	14	23	10	7	8
Other merchandise	6	52	58	7	26	20
All sectors	43	85	128	50	42	45
High-income countries						
Agriculture, food	26	109	135	30	54	47
Textiles, clothing	13	2	15	15	1	5
Other merchandise	4	5	9	5	2	3
All sectors	43	116	159	50	57	55
All countries liberalize						
Agriculture, food	54	128	182	63	64	63
Textiles, clothing	22	16	38	25	8	14
Other merchandise	10	57	67	12	28	23
All sectors	86	201	287	100	100	100

Source: Anderson and others (2006).

* Small interaction effects are distributed proportionately and numbers are rounded to sum to 100 per cent.

Annex table 3. Impacts of full global trade liberalization on agricultural and food output and trade, by country/region, 2015

(Relative to the baseline)						
Country/region	US\$ billion			Percentage change relative to baseline		
	Exports	Imports	Output	Exports	Imports	Output
Australia and New Zealand	18.0	1.4	27.9	38.0	23.0	20.5
EU25 and EFTA	21.7	103.5	-185.8	-10.8	39.3	-12.3
United States	18.4	16.5	30.7	11.6	25.6	0.0
Canada	14.6	6.9	7.2	40.2	54.3	4.8
Japan	2.8	34.7	-91.7	60.4	169.7	-18.4
Republic of Korea and Taiwan Province of China	33.2	12.3	-0.4	600.2	189.8	20.2
Singapore and Hong Kong, China	7.0	1.5	7.4	115.2	7.6	35.4
Argentina	10.4	0.7	12.2	44.2	36.9	11.5
Bangladesh	0.8	0.4	-2.5	60.9	15.6	0.8
Brazil	38.0	2.8	66.4	120.6	48.4	34.0
China	15.1	24.1	-9.9	145.6	27.3	-0.9
India	5.1	13.4	-23.8	53.2	165.4	-3.7
Indonesia	3.6	1.9	4.5	32.2	23.5	2.4
Thailand	5.6	5.2	5.3	29.2	57.2	4.7
Viet Nam	1.2	3.3	-2.1	13.9	170.4	-13.3
Russian Federation	0.7	4.4	-7.8	15.4	22.3	-5.4
Mexico	11.9	6.7	6.2	66.0	52.9	2.2
South Africa	2.4	1.1	1.4	55.9	40.2	4.9
Turkey	4.3	4.3	-0.1	109.4	140.3	0.5
Rest of South Asia	2.9	3.7	-1.5	57.1	83.3	-1.8
Rest of East Asia and the Pacific	9.4	5.8	7.4	61.7	50.7	6.8
Rest of Latin America and Caribbean	36.0	9.6	37.0	68.1	42.3	11.7
Rest of ECA	9.2	10.9	-22.2	106	90.5	-1.6
Middle East and North Africa	13.2	17.5	-7.8	64.1	43.1	-1.2
Selected sub-Saharan African countries	4.5	1.3	5.3	50.0	74.4	9.2
Rest of sub-Saharan Africa	9.5	8.1	-4.1	45.4	79.2	-0.6
Rest of world	8.2	5.8	2.9	168.3	123.3	4.4
High-income countries	115.8	176.7	-204.7	15.7	65.5	-5.3
Developing countries	191.9	131	66.8	67.4	51.5	2.2

Annex table 3 (continued)

(Relative to the baseline)						
Country/region	US\$ billion			Percentage change relative to baseline		
	Exports	Imports	Output	Exports	Imports	Output
Middle-income countries	156.1	93.1	88.2	72.7	41.9	3.2
Low-income countries	35.8	37.9	-21.4	52.3	99.3	-1.0
East Asia and the Pacific	34.8	40.4	5.2	54.4	35.5	0.1
South Asia	8.9	17.5	-27.8	55.1	122.9	-3.0
Europe and Central Asia	14.2	19.6	-30.0	79.7	62.6	-1.9
Middle East and North Africa	13.2	17.5	-7.8	64.1	43.1	-1.2
Sub-Saharan Africa	16.4	10.5	2.6	47.7	71.6	2.1
Latin America and the Caribbean	96.3	19.8	121.8	75.7	46.1	13.8
World total (excluding intra-European Union trade)	307.7	307.7	-137.8	36.3	59.8	-1.3

Source: Anderson and others (2006).

Annex table 4. Impact of global liberalization on self-sufficiency in food and agricultural products, selected regions, 2015*

Product	High-income countries		Developing countries		Sub-Saharan Africa		Latin America and Caribbean		South Asia		China	
	Baseline	Global liberalization	Baseline	Global liberalization	Baseline	Global liberalization	Baseline	Global liberalization	Baseline	Global liberalization	Baseline	Global liberalization
Rice	97	49	99	101	91	78	97	98	102	102	100	108
Wheat	137	118	89	91	53	35	90	119	98	98	90	92
Other grains	103	99	90	84	101	102	104	103	99	99	76	32
Oilseeds	119	55	75	90	158	279	184	247	100	102	1	1
Sugar	92	47	100	113	109	116	126	173	99	99	45	27
Plant-based fibres	117	78	95	104	385	694	94	109	87	92	93	95
Vegetables and fruit	83	72	103	105	137	141	146	183	95	88	97	97
Other crops	83	85	110	106	167	174	140	132	104	104	11	10
Livestock	103	104	98	98	103	103	103	102	99	99	94	94
Other natural resources	91	91	102	102	125	125	128	127	95	95	92	92
Fossil fuels	81	81	119	120	147	154	116	115	66	57	85	82
Processed meats	99	89	98	109	96	136	105	132	98	101	89	85
Vegetable oils, fats	96	91	98	99	85	72	111	106	65	25	96	90
Dairy products	103	100	88	92	74	78	92	94	97	97	60	57
Other food, beverages and tobacco	97	99	101	96	100	93	106	106	111	108	97	96
Textiles	91	91	99	98	75	62	85	79	130	134	99	98
Wearing apparel	63	55	153	162	78	62	92	80	513	765	225	255
Leather products	58	53	136	138	85	59	107	87	170	186	156	164
Chemicals, rubber, plastics	103	104	89	87	70	66	79	74	91	89	92	89
Iron, steel	99	100	97	96	94	93	100	92	95	92	93	92
Motor vehicles, parts	101	102	87	82	58	68	101	99	94	84	88	79
Capital goods	101	100	93	93	45	45	81	79	79	79	104	106
Other manufacturing	95	95	105	104	115	108	98	92	97	94	111	112

Annex table 4 (continued)

Product	High-income countries		Developing countries		Sub-Saharan Africa		Latin America and Caribbean		South Asia		China	
	Baseline	Global liberalization	Baseline	Global liberalization	Baseline	Global liberalization	Baseline	Global liberalization	Baseline	Global liberalization	Baseline	Global liberalization
Agriculture and food	98	93	99	100	108	111	111	120	99	96	91	91
Agriculture	97	84	98	100	118	123	121	134	99	98	88	88
Processed foods	98	97	99	98	98	97	105	111	98	87	96	94
Textile and wearing apparel	74	70	114	116	77	61	92	81	149	163	125	129
Other manufactures	98	98	98	97	92	91	93	89	88	85	101	101

Source: Anderson and others (2006).

* Self-sufficiency is defined as domestic production as a percentage of domestic consumption.

Annex table 5. Change in real income in alternative Doha scenarios, 2015
(In 2001 US\$ billion compared with baseline scenario)

Country/region	Scen. 1	Scen. 2	Scen. 3	Scen. 4	Scen. 5	Scen. 6	Scen. 7	Scen. 8
Australia and New Zealand	2.0	1.1	1.1	2.2	1.2	1.2	2.4	2.8
EU25 and EFTA	29.5	10.7	9.1	28.2	10.7	10.9	31.4	35.7
United States	3.0	2.3	2	3.4	2.5	2.1	4.9	6.6
Canada	1.4	0.5	0.3	1.2	0.4	0.4	0.9	1.0
Japan	18.9	1.8	1.3	15.1	1.4	12.9	23.7	25.4
Republic of Korea and Taiwan Province of China	10.9	1.7	1.6	7.3	1.7	15.9	15	22.6
Singapore and Hong Kong, China	-0.1	-0.1	-0.1	-0.1	-0.2	-0.2	1.5	2.2
Argentina	1.3	1.0	1.0	1.4	1.1	1.0	1.3	1.6
Bangladesh	0.0	0.0	0.0	0.0	0.0	0.0	-0.1	-0.1
Brazil	3.3	1.1	0.9	3.2	1.1	1.1	3.6	3.9
China	-0.5	-1.5	-1.6	-0.4	-1.4	-1.1	1.7	1.6
India	0.2	0.2	0.2	0.1	0.2	0.2	2.2	3.5
Indonesia	0.1	0.2	0.2	0.2	0.2	0.0	1.0	1.2
Thailand	0.9	0.6	0.3	1.0	0.8	0.8	2.0	2.7
Viet Nam	-0.1	0.0	0.0	-0.1	-0.1	-0.1	-0.5	-0.6
Russian Federation	-0.3	-0.7	-0.8	-0.1	-0.7	-0.7	0.8	1.5
Mexico	-0.2	-0.3	-0.3	-0.2	-0.3	-0.3	-0.9	-0.2
South Africa	0.1	0.3	0.1	0.1	0.2	0.3	0.4	0.7
Turkey	0.6	0.0	0.0	0.5	0.1	0.0	0.7	1.4
Rest of South Asia	0.2	0.1	0.1	0.2	0.1	0.2	0.3	0.7
Rest of East Asia	0.1	0.0	0.0	0.1	0.1	1.0	0.3	0.6
Rest of Latin America and Caribbean	3.7	0.5	0.5	3.7	0.5	0.4	3.9	4.0
Rest of ECA	-0.2	-0.3	-0.3	-0.2	-0.2	-0.2	-0.6	-0.7
Middle East and North Africa	-0.8	-1.2	-1.5	-0.9	-1.2	-1.2	-0.6	0.1
Selected sub-Saharan African Countries	0.1	0.0	0.0	0.1	0.0	0.0	0.1	0.2
Rest of sub-Saharan Africa	0.0	-0.3	-0.3	0.0	-0.3	-0.3	-0.1	0.3
Rest of world	0.4	0.0	0.0	0.3	0.0	0.0	0.6	0.6
High-income countries	65.6	18.1	15.2	57.2	17.8	43.2	79.9	96.4
Developing countries	9.0	-0.4	-1.7	9.1	0.1	1.1	16.1	22.9
Middle-income countries	8.0	-0.5	-1.9	8.3	0.0	1.0	12.5	17.1
Low-income countries	1.0	0.1	0.1	0.8	0.2	0.0	3.6	5.9
East Asia and the Pacific	0.5	-0.8	-1.2	0.9	-0.4	0.6	4.5	5.5
South Asia	0.4	0.3	0.3	0.3	0.3	0.4	2.5	4.2
Europe and Central Asia	0.1	-0.9	-1.1	0.2	-0.9	-0.9	0.8	2.1
Middle East and North Africa	-0.8	-1.2	-1.5	-0.9	-1.2	-1.2	-0.6	0.1
Sub-Saharan Africa	0.3	0.0	-0.2	0.3	-0.2	-0.1	0.4	1.2
Latin America and the Caribbean	8.1	2.3	2.0	8.0	2.5	2.1	7.9	9.2
World total	74.5	17.7	13.4	66.3	17.9	44.3	96.1	119.3

Source: Anderson and others (2006).

**Annex table 6. Change in real income in alternative Doha scenarios,
2015 percentage change**

(In 2001 US\$ billion compared with baseline scenario)

Country/region	Scen. 1	Scen. 2	Scen. 3	Scen. 4	Scen. 5	Scen. 6	Scen. 7	Scen. 8
Australia and New Zealand	0.35	0.20	0.18	0.38	0.22	0.20	0.42	0.48
EU25 and EFTA	0.29	0.11	0.09	0.28	0.11	0.11	0.31	0.36
United States	0.02	0.02	0.01	0.02	0.02	0.01	0.03	0.05
Canada	0.15	0.05	0.03	0.13	0.05	0.05	0.10	0.11
Japan	0.38	0.04	0.03	0.30	0.03	0.26	0.48	0.51
Republic of Korea and Taiwan Province of China	0.86	0.13	0.13	0.58	0.14	1.26	1.19	1.79
Singapore and Hong Kong, China	-0.02	-0.03	-0.03	-0.02	-0.04	-0.04	0.35	0.52
Argentina	0.32	0.26	0.25	0.34	0.27	0.26	0.34	0.39
Bangladesh	-0.06	-0.03	-0.02	-0.06	-0.03	-0.04	-0.10	-0.09
Brazil	0.50	0.16	0.13	0.49	0.17	0.17	0.55	0.59
China	-0.02	-0.06	-0.06	-0.01	-0.05	-0.04	0.07	0.06
India	0.02	0.03	0.02	0.02	0.03	0.02	0.25	0.40
Indonesia	0.05	0.07	0.07	0.08	0.09	0.01	0.37	0.44
Thailand	0.43	0.29	0.15	0.49	0.38	0.38	0.99	1.33
Viet Nam	-0.20	-0.09	-0.06	-0.22	-0.11	-0.16	-0.83	-0.97
Russian Federation	-0.06	-0.16	-0.17	-0.03	-0.15	-0.15	0.16	0.31
Mexico	-0.02	-0.04	-0.04	-0.02	-0.04	-0.04	-0.11	-0.02
South Africa	0.06	0.17	0.05	0.09	0.11	0.17	0.25	0.49
Rest of South Asia	0.13	0.05	0.05	0.11	0.06	0.14	0.17	0.39
Rest of East Asia	0.02	0.01	0.01	0.05	0.04	0.36	0.09	0.22
Rest of Latin America and Caribbean	0.44	0.06	0.06	0.43	0.06	0.04	0.46	0.47
Rest of ECA	-0.06	-0.09	-0.09	-0.06	-0.09	-0.08	-0.22	-0.26
Middle East and North Africa	-0.07	-0.10	-0.13	-0.07	-0.10	-0.10	-0.05	0.01
Rest of sub-Saharan Africa	0.02	-0.13	-0.13	0.01	-0.14	-0.14	-0.02	0.13
Rest of world	0.19	0.0	0.0	0.14	0.0	0.02	0.26	0.28
High-income countries	0.20	0.06	0.05	0.18	0.05	0.13	0.25	0.30
Developing countries	0.09	0.0	-0.02	0.09	0.0	0.01	0.16	0.22
Middle-income countries	0.10	-0.01	-0.02	0.10	0.0	0.01	0.15	0.21
Low-income countries	0.05	0.01	0.01	0.04	0.01	0.0	0.18	0.30
East Asia and the Pacific	0.01	-0.02	-0.03	0.03	-0.01	0.02	0.13	0.16
South Asia	0.03	0.03	0.02	0.02	0.03	0.03	0.21	0.36
Europe and Central Asia	0.01	-0.09	-0.11	0.02	-0.09	-0.09	0.08	0.21
Middle East and North Africa	-0.07	-0.10	-0.13	-0.07	-0.10	-0.1	-0.05	0.01
Sub-Saharan Africa	0.06	-0.01	-0.05	0.06	-0.04	-0.02	0.10	0.27
Latin America and the Caribbean	0.29	0.08	0.07	0.29	0.09	0.08	0.29	0.33
World total	0.18	0.04	0.03	0.16	0.04	0.10	0.23	0.28

Source: Anderson and others (2006).

Annex table 7. Share of agricultural and food production exported under different scenarios, 2001 and 2015

(Unit: per cent)

Countries/regions	Baseline 2001	Baseline	Full global liberalization, 2015	Scenario 7
Australia and New Zealand	33.3	37.2	42.7	39.5
EU25 and EFTA	16.7	17.3	17.6	16.6
EU25 and EFTA (excluding intra-EU25)	4.0	5.1	7.7	5.0
United States	6.3	7.9	9.2	8.1
Canada	24.5	29.5	40.0	32.5
Japan	0.9	1.2	2.3	1.5
Republic of Korea and Taiwan Province of China	4.4	4.8	26.5	8.6
Singapore and Hong Kong, China	26.0	30.0	47.8	30.8
Argentina	21.6	25.2	32.5	26.9
Bangladesh	1.7	3.6	5.7	3.5
Brazil	15.3	17.3	28.9	21.7
China	3.3	0.9	2.2	1.0
India	3.5	3.0	4.7	3.3
Indonesia	11.9	10.0	12.9	9.9
Thailand	30.2	28.2	34.6	30.1
Viet Nam	23.9	26.9	35.3	26.7
Russian Federation	6.1	5.5	6.7	6.0
Mexico	5.6	7.8	13.2	8.5
South Africa	16.0	12.7	18.8	13.5
Turkey	9.6	6.0	12.4	7.0
Rest of South Asia	6.0	6.2	9.9	6.6
Rest of East Asia	16.1	14.6	22.1	14.9
Rest of Latin America and Caribbean	13.9	18.1	27.1	20.7
Rest of ECA	2.4	1.7	3.7	1.9
Middle East and North Africa	5.2	6.7	11.2	7.2
Selected SSA countries	13.2	18.1	25.4	19.2
Rest of sub-Saharan Africa	11.2	15.8	23.3	16.5
Rest of world	6.6	7.0	17.7	8.7
High-income countries	5.8	7.5	11.6	8.2
Developing countries	7.5	6.9	11.6	7.8
Middle-income countries	7.6	6.6	11.4	7.6
Low-income countries	7.3	7.9	12.4	8.4
East Asia and the Pacific	7.2	4.1	6.5	4.3
South Asia	3.8	3.6	5.7	3.9
Europe and Central Asia	3.7	2.7	5.0	3.0
Middle East and North Africa	5.2	6.7	11.2	7.2
Sub-Saharan Africa	12.5	15.8	23.1	16.6
Latin America and the Caribbean	12.7	15.9	24.8	18.5
World total	9.5	9.5	13.2	10.0
World total (excluding intra-EU25)	6.6	7.2	11.6	8.0

Source: Anderson and others (2006).