

Diversity of impact

Agricultural trade liberalisation, poverty and development

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There appears to be a consensus that the interests of developing countries lie mostly in the liberalisation of trade in manufactures and services. Despite this insight, the WTO negotiations on agriculture have been a stumbling bloc for the developing countries. This study reviews the effects of agricultural trade liberalisation on economic growth and poverty alleviation. A recurring theme is the wide diversity of effects across regions, economic activities, groups in society (urban consumers, rural producers), and households.

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Preface

The Doha round of trade talks under the WTO has been dubbed Development Agenda in order to address 'the need for all our peoples to benefit from the increased opportunities and welfare gains that the multilateral trading system generates', as the Doha Declaration puts it (WTO, 2001). As the round proceeded, trade analysts have demonstrated a wide range of potential benefits and losses from trade liberalisation, using a variety of methods. Generally, the global economy-wide assessments predict positive welfare effects from trade reform, shared between industrial countries (2/3ds of the gain) and developing countries (1/3rd of the gain). Over the past years, there has been a substantial downward adjustment of the expected gains from reform. Most important, the revision is related to better measurement of trade protection but it also reflects reduced ambitions of a Doha agreement.

Despite the apparent interests of developing countries in the liberalisation of trade in manufactures and services, the WTO negotiations on agriculture have been a stumbling bloc for the developing countries. Those united in the G20 group have referred repeatedly to the agricultural concessions from the EU and US (or the lack thereof). Agricultural support policies in the high-income countries have featured prominently in the policy debate.

This study examines whether developing countries should endorse agricultural WTO reform on agriculture, as part of a policy mix aimed at economic growth and poverty alleviation. Some of the more compelling arguments are produced by global economic models. Yet, trade models are caricatures, in the sense that they blow up certain features of economic impact, be it export response to market opening in the high income countries, or employment effects during a period of transition. The paper underscores that caution is required in the interpretation of such results.

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Dr J.C. Blom
Director General LEI

Summary

There appears to be a consensus that the interests of developing countries lie mostly in the liberalisation of trade in manufactures and services, at least with proper safeguards and side policies in place. Despite this insight, the WTO negotiations on agriculture have been a stumbling bloc for the developing countries. This study reviews the effects of agricultural trade liberalisation on developing countries, first from the perspective of agricultural markets, then economy-wide, and finally with respect to household level impact. A recurring theme is the wide diversity of effects across regions, economic activities, groups in society (urban consumers, rural producers), and households.

Agricultural trade liberalisation and development

The critical economic mechanisms that operate together to determine potential economic impact of global agricultural trade reform on developing countries are summarised as follows:

- (i) global supply reduces for programme commodities in OECD countries (wheat, grains), as farmers respond to the declined production incentives from domestic support and the phase-out of export subsidies. The resulting upward pressure on program commodity prices on global markets causes declining terms of trade for countries that are net importer of these commodities, and improving terms of trade for net exporters;
- (ii) global agricultural trade expands as tariffs come down and the constraints imposed by (tariff rate) quota are relaxed. Trade creation occurs as competitive producers reap market opportunities previously barred by trade measures, gaining market share on domestic producers in the countries opening up;
- (iii) the competitive producers gain market share on the less competitive producers that benefited, before reform, benefited from preferential access to OECD agricultural markets and now find that their trade preferences erode;
- (iv) increased competition and global consolidation of food supply induces technological change and productivity growth, making free available resources for alternative use. Structural changes are reflections of shifts of factors of production from one sector to the other.

Under effects (i), (ii) and (iii), market opening allows resources involved in agricultural production to flow to their most productive use, creating efficiency gains. The structure of the agricultural sector and the share of agriculture in GDP respond accordingly to price changes in factor markets (labour, capital) and national and international goods markets. The most-applied tools for economic analysis of trade reform are geared at this economic adjustment - often with a time horizon of 5 to 15 years. An additional effect, of type (iv), covers the possible impact of trade reform on the longer term, such as interactions between trade growth and the state of technology and institutions. Economists refer to

these as dynamic effects, and have a hard time to incorporate them into their analyses at similar level of detail as the other, static, effects.

The evidence on the set of static effects presented supports the conclusion that the burden imposed by OECD farm policies on the developing countries as a group is limited yet unequally spread within the group. A key driver of that conclusion is the fact that, among the developing countries, only twelve countries are net exporters on the world markets for agricultural commodities, and nine out of ten countries are net importers. The countries importing the temperate zone export goods from the OECD countries, mainly cereals and livestock products, benefit to some extent from a lower import bill due to the program support for agricultural producers in the high income countries. However, the evidence is incomplete. The extent to which importers will actually face rising import prices is uncertain because the price effects of the restructuring of farm policies from production related support to a 'decoupled' single farm payment are unclear. Moreover, outside the cotton case the economic literature falls short to provide serious assessments of the impact of (implicitly or explicitly) subsidised farm exports on agricultural production and trade, and the wider economy.

From a long run perspective, depressed world prices discourage entry of temperate crop producers, and reduce the exit incentives of developed country producers, possibly even to the extent that trade positions would differ if it were not for the present policies. To speed up capacity development and technological change, developing countries can expect much more from opening up for foreign trade and investment than from the reform of OECD farm and farm trade policies. However, many uncertainties over the economic impact on developing countries remain.

In summary, due to terms of trade losses and preference erosion, for the wide majority of developing countries the interests in reform of OECD farm policies appear bleak unless the positive spill-over into technological or institutional change is considered. One must conclude, however, that the direct effects from trade reform tend to dominate the debate. In that perspective, key points for developing countries are that (a) global agricultural reform contributes to reduce substantial distortions within developing country agriculture; and (b) global agricultural reform is embedded in an all-sector liberalisation effort, in order to provide opportunities to make up the losses from agricultural reform in non-agricultural activities and markets.

Global estimates of economic impact

Global economic models that apply a general equilibrium framework and the GTAP database, for all their shortcomings, contribute quantitative analysis to the policy debate on trade liberalisation. This is all the more important when many of the economic effects of trade liberalisation on developing countries are theoretically undetermined. In agriculture, unlike other sectors, other countries' policies have effects on the liberalising country that may warrant caution for a coordinated liberalisation effort involving several countries. The results from global models could lead the way, if and when sensibly applied and interpreted.

In terms of fostering global economic expansion, agricultural trade reform is not your horse to bet on. Based on a selection of influential assessments of economic impact, one may conclude that there are few gains to be had from agricultural trade liberalisation. For

the developing countries, the carrot for participation in a global agricultural liberalisation is even smaller as their share in the gains from the total elimination of agricultural distortions is smaller than the high income countries.

The reforms implied by scenarios for a possible Doha agreement on agriculture lack ambition, especially concerning market access: some apply linear tariff cuts, others offer large exceptions for tariff cuts to highly protected sector. For a proper assessment of the effects of reform to domestic support or export competition, generally GTAP applications must be interpreted with caution because of the limited level of detail.

Under a possible Doha agreement on agriculture, developing countries as a group will likely incur some losses, or a modest gain. The effects of agricultural trade reform are generally too small to have an overriding on trade or development. The global models applied at the World Bank and the Carnegie Endowment for International Peace provide quantitative support for the hypothesis that countries' trade position in temperate zone agricultural products (cereals and livestock products from the OECD countries) largely predicts their (short term) welfare effects from trade reform; welfare gains occur in net exporting countries while net importers encounter welfare losses. African countries generally suffer from agricultural trade reform. These regions incur potential losses of 0.1 to 1.5% of GDP, as the northern and Sub-Sahara regions experience rising import costs and eroding trade preferences. Selected African exporters will benefit from trade expansion of high-value agriculture. In Asia, the economic importance of non-agricultural market access and services reform dwarfs the effects from agriculture. In China, rising import intensity for temperate zone products in combination with price rises causes losses to the extent of 0.3 to 1.5% of GDP. The low-income countries in Asia shift resources out of agriculture into labour-intensive manufacturing, thus increasing agricultural imports. The Asian agricultural exporters stand to gain from reform, but the extent to which they deepen their specialisation differs between analysts. Less heroic assumptions on the price responsiveness of exports results in more modest export and welfare effects. The current agricultural exporters in Latin America are the biggest beneficiaries of agricultural trade reform. Although curtailed by a lack of ambition in trade reform, Brazil and Argentina harvest potential gains of 0.3 to 1.1% of GDP as they deepen their agricultural specialisation. Some other net exporters, such as Paraguay, Chile and Bolivia benefit from rising agricultural prices and market opening in Mexico, one of the world's largest importers of food and feed. An all-sector trade liberalisation will possibly drive more resources into agriculture, as the relatively productive sector in Latin America.

To the observer, it is perhaps worrying how similar are the expectations of trade analysts on possible economic effects of a trade reform under the Doha round. The dominant input into the policy debate on trade liberalisation is produced by global economic analyses, all of which use the same data and similar methodology. This is a setting that pushes those who are not a priori in favour of trade liberalisation, and in particular of agricultural trade liberalisation, on the defence. Global economic models have biases against measuring the diversity of economic impact across countries or sectors in detail. However, at the aggregate level the potential losses of agricultural trade reform appear small while they are pertinent in some regions or for selected groups in society.

Several methodological improvements are considered of critical importance to arrive at global economic analyses that are more relevant to the policy agenda for sustainable de-

velopment. A key area of interest is the distribution of welfare effect at regional and household level in order to get a better perspective on the poverty impact of reform. Also, it is necessary to improve the representation of domestic markets in the developing countries. Policy shocks are transmitted to households through markets for goods and factors of production (capital, land and labour), and much of the transmission requires further exploration. Finally, farm and farm trade policies are among the most complicated interventions. Given the pivotal importance of agriculture for employment and growth in the developing countries, and the focus on agriculture in the trade negotiations, applied need to represent policies with due care and avoid simplifications.

Trade and poverty

There are strong links between agricultural trade and poverty. For poor households in developing countries, agriculture is the main source of income or food security, and food products are the main expenditure. Food markets in the developing countries have become increasingly open to trade in the last few decades, which exposed farmers and consumers to developments in international markets and global policy change. There is, therefore, a need for a proper understanding of the consequences of agricultural trade liberalisation on the poor and the vulnerable. Too much of a focus on agriculture will misguide poverty analyses in the rural area because earnings from farming commonly are one of several sources of income. As the earnings in off-farm activities are potentially affected by policies affecting the markets for manufactures and services, the labour market is a natural starting point for the poverty analysis of a multi-sector trade reform.

Five years ago the applied research on trade and poverty was still in its infancy but of the Doha round has provided an impetus for a rapid expansion of the literature. At present, the first preliminary quantitative estimates of the poverty effects from trade reform are available from the World Bank. The results indicate that a global economy-wide trade liberalisation may push tens of millions of people out of poverty but the impact of a possible Doha agreement is small or, in Sub-Sahara Africa, even counterproductive. It is neither wise nor intended to take these numerical estimates too literally. This chapter has presented ample evidence which renders these numerical estimates as premature attempts, useful as yardsticks only.

Some refer to trade and poverty links as a puzzle, the pieces of which relate to income and expenditure in the household on the one hand, and trade reform on the other hand. In a simple framework, after world price or policy changes enter the system, the interplay of border prices with domestic factor and output markets determines impact at the bottom scale, i.e. the household level. Some good case studies are available; several apply global economic modelling with some module for poverty assessment; others focus on the interplay between national markets and household decisions, and examine the spatial impact or institutional settings of reform.

The generalisation across links between agricultural trade liberalisation and poverty is difficult because the impact of trade liberalisation on poverty depends on the environment in which it is carried out. In most cases liberalisation works out well for the rural poor, but there are still many cases where trade reform can have adverse effects on the poor. In this respect, trade reforms are to be seen as one element in a package of policies aimed at realising potential benefits, and mitigating the negative impact of trade reform on

the poor. Proper sequencing of reforms is of paramount importance. For instance, a reform of domestic tax collection must anticipate the loss of tariff revenues. Also, developing countries would do better to liberalise their imports after developed countries have cut back farm support. Only if trade liberalisation is implemented with care, it can be a good means to tackle poverty.

Progressively, analysts are turning to the quantification of the trade and poverty links. This chapter illustrated some of the methods and complications involved in examining the trade and poverty links. The discussion focuses on price transmission (how price changes at domestic markets influence the incomes of households); factor mobility and market failure; the production and consumption decision in the households following changing factor prices; the issue of fiscal replacement of lost tariff revenues and the impact on households. The analytical gaps on the trade-poverty links are increasingly well-defined.

1. Introduction

The Doha round of trade talks under the WTO has been dubbed Development Agenda in order to address 'the need for all our peoples to benefit from the increased opportunities and welfare gains that the multilateral trading system generates', as the Doha Declaration puts it (WTO, 2001). As the round proceeded, trade analysts have demonstrated a wide range of potential benefits and losses from trade liberalisation, using a variety of methods. Generally, the global economy-wide assessments predict positive welfare effects from trade reform, shared between industrial countries (2/3ds of the gain) and developing countries (1/3rd of the gain). Over the past years, there has been a substantial downward adjustment of the expected gains from reform. Most important, the revision is related to better measurement of trade protection but it also reflects reduced ambitions of a Doha agreement. With the Round formally suspended half-way 2007, a deal will require substantial negotiation effort in the coming years.

There appears to be a consensus that the interests of developing countries lie mostly in the liberalisation of trade in manufactures and services, at least with proper safeguards and side policies in place (Charlton and Stiglitz, 2005). Despite this insight, the WTO negotiations on agriculture have been a stumbling bloc for the developing countries; at least those united in the G20 group have referred repeatedly to the agricultural concessions from the EU and US (or the lack thereof). Agricultural policies in the OECD countries have featured prominently in the policy debate. Some of the more polarising contributions to the debate have been based on fallacies in relation to the supply response in the least developed countries (Panagariya, 2005).

This study reviews the effects of agricultural trade liberalisation on developing countries, first from the perspective of agricultural markets, then economy-wide, and finally with respect to household level impact. A recurring theme is the wide diversity of effects across regions, economic activities, groups in society (urban consumers, rural producers), and households.

Chapter 2 examines the impact of farm and farm trade policies, and their reform under the WTO, on the developing countries. While the short term economic effects of a partial multilateral liberalisation of agricultural are, at best, not enhancing welfare in the developing countries, the benefits appear more convincing in the longer term.

To the observer, it is perhaps worrying how similar are the expectations of trade analysts on possible economic effects of a trade reform under the Doha round. The dominant input into the policy debate on trade liberalisation is produced by global economic analyses, all of which use the same data and similar methodology. Chapter 3 assesses the strengths and weaknesses of this approach. It gives insight into the range of results across several studies and arrives at an agenda on how to gear the current analytical methods towards more relevant contributions to the debate on sustainable development and poverty alleviation. Chapter 4 discusses the relations between agricultural trade and poverty, and introduces the reader into the analysis of poverty effects from trade liberalisation.

2. Agricultural trade liberalisation and economic development

The theory of trade liberalisation asserts that the removal of own distortions will bring welfare gains to the liberalising country. Agriculture is different in that respect. Other countries' policies have effects on the liberalising country that may warrant caution for a coordinated liberalisation effort involving several countries.

This chapter examines the impact of farm policies in the OECD countries on the developing countries. It assesses the market impact of policies currently in place, and asks whether the existence of these policies changes the expected impact from liberalisation. The approach is to reason through the most forceful mechanisms for economic impact on developing country agriculture. Trade positions are important indicators of economic impact, which is why they are reviewed first.

2.1 Agricultural trade and the developing countries

Growth of global agricultural trade is slowing down and falling behind other merchandise trade. During the 1980s global agricultural and manufacturing trade still expanded at an annual rate of about 5%. The 1990s saw annual growth rates of agricultural exports decelerate to 3.7% while manufacturing exports accelerated to 6.7%. The slowdown of agricultural export growth is attributed to the decline in import growth rates in the high income countries, which more than halved during the 1990s (Aksoy and Beghin, 2005). Recent oil price developments aggravated the long term trend of declining relevance of agricultural products in global merchandise trade. Over the years 2000-05, the WTO reports a share of agriculture in global merchandise trade below 9%, down from about 11.5% in the 1990s and 40% in the 1950s (WTO, 2006).

Agricultural exports from the developing countries expanded at an annual rate of 5% between 1980 and 2001, similar to or slightly above the global average. The share of developing countries has hovered around 40% of global agricultural trade (excluding EU-intra trade) during the years 1993-2003, which suggests that the implementation of Uruguay Round disciplines on farm support and border protection has had little effects on the developing countries.¹ Agricultural exports are primarily an affair of the middle income countries. Less than 2% of exports from the developing countries originate from the least-developed countries whose most important agricultural export goods are sugar and bananas (Van Berkum and Roza, 2005).

High income countries remain the most important export destinations for the developing countries, accounting for 62% of exports in 2000-01, but the share of trade between the developing countries - sometimes referred to as south-south trade - is rising, to nearly

¹ Changes in wealth and consumer demand are stronger determinants of global trade patterns in the 1990s than policy reform (Van Berkum and Roza, 2005).

14% of global agricultural trade in 2000-01. The growth rate of exports into the high income countries decelerated from 6% in the 1980s to over 4% in the 1990s due to sluggish import demand and low price levels. Income elasticities for the traditional commodities have reduced since the 1980s in the high income countries: as income increased, less was spent on commodities, and more was spent on high-value products (Aksoy and Beghin, 2005). As a result, the importance of commodity trade reduced while strong growth occurred in trade of high-value products such as fruit, vegetables and flowers, fisheries products, and alcoholic and non-alcoholic beverages. The share of these high value products in world agricultural trade boosted from an average of 25% during 1980s to 40% in 2000-01.

The structure of agricultural exports from middle income countries has responded to the altered market conditions. Having realised annual growth rates of over 4% in the 1980s and nearly 7% in the 1990s, the exports of seafood and horticultural products now exceed trade in traditional export commodities such as coffee, cocoa, tea, and sugar. Exports of temperate-climate products such as grains, meat, and oilseed products are also expanding rapidly, at annual rates exceeding 3%. Despite these developments, commodities continue to dominate developing country exports into the high income countries despite declining shares of commodities in world trade since the 1980s. Commodities cover 61% of exports from middle income countries into the high-income countries in 2003, or over USD 45 billion of trade. In south-south trade, the processed agricultural and food products are more important, accounting for 52% of trade. The exports of processed goods into the developing countries, valued at USD 35 billion in 2000-01, recently surpassed processed food exports into the high income countries.

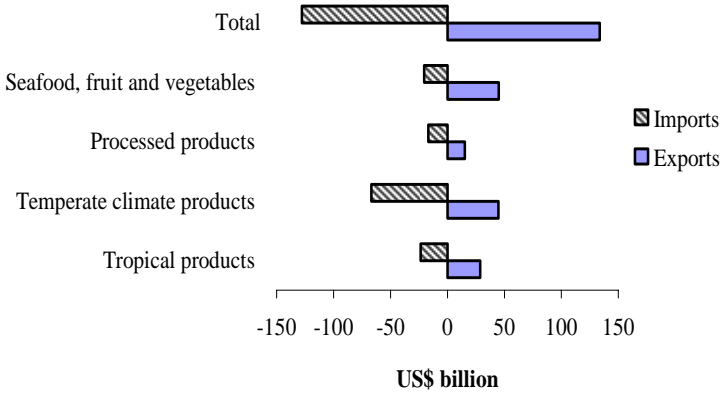


Figure 2.1 Agricultural trade of the developing countries, 2001-03
 Source: PCTAS, calculations by LEI.

Net trade positions of developing countries vis-à-vis high income countries

It shall be argued below that the net trade positions of the developing countries are critical indicators of the burden of distortions in agricultural markets where there is direct competition with the high income countries. Table 1 summarises the trade positions of the developing countries vis-à-vis the high income countries, per product group, for the years

2001-03. The trade surplus amounts to USD 18 billion for food and agriculture (excluding wood and cut flowers). Consistent with Aksoy and Beghin (2005), the developing countries are net exporters of seafood, fruit and vegetables and, to a declining extent, of tropical products. They are net importers of temperate climate goods (cereals and livestock products) and processed goods. A critical insight, net trade positions hide substantial import and export flows in all products.

The developing countries (low and middle income) have, as expected, a large trade deficit with the industrialised countries in temperate-climate products. Total exports of temperate products from the developing countries are USD 44.6 billion, and total imports add up to USD 66.8 billion. As trade between the developing countries cancels out, the difference worth USD 22.2 billion are the average net imports of temperate-climate products from the high income countries into the developing countries.

Nine out of every ten developing countries are net importer of temperate climate products.¹ Mexico, importing over USD 6.6 bln per annum in the years 2001-03 is by far the largest net importer, and its import bill is growing at an annual rate over 5%. Other large net importers are China (USD 3.3 bln), Taiwan (USD 2.4 bln) and the countries Algeria, Egypt, Iran (annual net imports between USD 1.9 and 2.4 bln). China is the largest importer (USD 7.8 bln). Data for China appears unreliable; in 2003 imports expand by more than 60%. Brazil and Indonesia have both large imports and exports of temperate climate products.

Twelve developing countries are net exporters over these years: one low-income country (India), eight lower middle income countries (Brazil, Thailand, Paraguay, Indonesia, Peru, Kazakhstan, Bolivia, and Nicaragua) and three upper middle income countries (Argentina, Malaysia, Uruguay). Brazil, exporting annually temperate products worth over USD 10.6 billion in 2001-03 is the largest exporter by far, followed by Argentina (USD 5.8 bln), Malaysia (USD 3.2 bln) and Thailand (USD 1.3 bln). Malaysian exports more than double over two years.

2.2 Trade liberalisation affects different countries differently

This section examines the key market mechanisms that operate together to determine potential economic impact of global agricultural trade reform on developing countries. Impact is potential because we assume that markets pass on price signals and auction available resources, and that the factors of production are sufficiently mobile across uses and regions.

If markets behave as trade theory teaches, trade liberalisation generates greater trade volumes, 'thicker' and thereby more stable world markets, and downward pressure on world prices. A net importing country that liberalises its imports would experience a drop in the domestic price level to the benefit of domestic consumers, while hurting domestic producers. In the context of multilateral liberalisation of agricultural trade- and domestic policies, however, world food prices can be expected to increase which will be disadvanta-

¹ Out of 107 reporters in the PCTAS database that are low and middle income countries, 95 are net importers. The 72 countries not included in the database are largely low income countries that are known to depend on food imports for a shortage of domestic supply.

geous to the trade balance of food importing countries. The expected effects on the developing countries differ, broadly, with the level of development, and a country's trade relation with the industrialised (OECD) countries.¹

The level of development is important because of the economic weight of the various sectors. Generally speaking the policy mix that a country may pursue is correlated to the level of development. For example, concerns about food security typically arise in low-income countries. Low and middle-income countries tend to emphasise development of their agricultural sector, followed by policies targeted at promotion of food-processing activities. The prototypical higher middle income country is in transition from a predominantly agrarian society to an economy that is based on labour-intensive manufacturing.² At the higher end of the income scale, developed countries are in movement to a knowledge-intensive/service based economy. Throughout each phase, agriculture has specific linkages with the manufacturing and services sectors (Mundlak, 2000). Also, the macroeconomic and fiscal context of trade reform differ. For example, the higher the level of development the more governments collect VAT and income taxes, thus reducing their reliance on tariffs revenues. The fiscal consequences of declining tariff revenues following tariff cuts are of special concern to the low income countries (Taylor, 2006). Finally, the level of development correlates to the quality of economic institutions, which has important implications for the mobility of factors of production and for transmittance of price signals in factor and goods markets (Kydd and Dorward, 2006).

The nature of the trade relations with the OECD countries is another determinant of potential economic impact of global agricultural trade reform. It is widely accepted that the liberalisation impact on exporting countries is different from the effects on importers: a reduction in import barriers will cause world market prices to rise; this benefits exporters and increases the import bill for importing countries.

Several other trade dimensions can be taken into account. First, which sectors are earning most export revenues: primary agricultural products, processed food products, unskilled manufacturing, skilled manufacturing, or services. It is obvious that the weight that countries attach to the various items on the agenda of a comprehensive round of trade negotiations depends on the domestic economic importance of certain sectors. The next chapter explores agricultural trade reform in the context of liberalisations of merchandise trade.

A second element for consideration is whether a country exports products that are competing with developed country products. Protective arrangements in developed countries exist primarily for commodities which are produced in the same developed countries, while trade barriers for non-competing products vis-à-vis developing countries typically tend to be low already. Non-competing agricultural products may for example be tropical zone products that are not at all grown in developed countries (e.g. tropical fruits, tropical beverages), or it may be products that are grown in both tropical- and temperate climates but, the tropical exporter utilises a different seasonal pattern (e.g. vegetables) or competes year round (as with oil crops). It is especially in the area of competing products where ten-

¹ The rest of this section uses material from Van Meijl and Van Tongeren (2001).

² See Koning et al. (2006) for a discussion on the historical development of agriculture in Kenya and Bolivia, and agriculture's changing position in the economic system in these countries.

sions arise and where certain developing countries have an interest in achieving better access to high-income markets, as argued below.

2.3 Effects of OECD farm policies on developing country trade

The rhetoric over global trade reform features eloquent claims that farm policies in the high income (OECD) countries impede the growth of agricultural production and exports in the developing countries, and curtail economic development. Having reviewed the channels through which developing countries would be affected by a removal of current distortions in agricultural trade, the next step is to provide empirical detail on the distortions in the following paragraphs. Trade liberalisation will have its effects through the markets for agricultural products and the factors used in agricultural production. This section examines how policies on global agricultural markets interact with the agriculture economy in developing countries. For that purpose, we review the literature at the nexus of trade and development with considerable detail on the agriculture. A typical feature of this body of literature is that it downplays the widespread interactions between agriculture and the rest of the economy, which largely operate via markets for the factors labour and capital. Such linkages are a prime subject of the global economic models that we will introduce in the next chapter.

What follows describes the distortions and the impact of their removal on the agriculture economy in developing countries. Most attention is on the *static* effects, a technical term for one-off changes to prices or quantities in the market. This is followed by a brief comment on the dynamic effects, which relate to agriculture's growth potential. Farm policies limit developing country production and entry into global export markets, and prevents exit of groups of higher than least-cost producers. Our interpretation of the literature is that static effects tend to dominate the debate; in effect, from a dynamic perspective, there is a much stronger case why agricultural trade liberalisation is in the interests of developing countries.¹

2.3.1 Domestic support

High income countries' farm policies are over-accused by OXFAM and other interest groups of causing economic dismay in developing countries, according to Tangermann (2005), chief agricultural economist at the OECD secretariat. His reasoning is rather straightforward. Domestic support and market intervention, the cornerstone of OECD countries' farm policies, depress the prices for cereals and livestock products (meat and dairy) on world markets. Stimulating a large supply, and facilitating the layoff of excess supply on world markets by means of export subsidies, OECD farm policies are unambiguously deterring marketing opportunities for developing country exporters of products that compete with OECD programme crops. However, most low income countries and a respectable number of middle income countries are net importers of cereals and livestock

¹ There are, however, other possible motivations for reform related, for instance, to the efficient allocation of resources or the spending of tax revenues on public goods.

products. Net importing countries - their imported volume exceeds exports - have an interest in maintaining the prices at their current low levels. As far as trade reform results in upward pressure on world markets, and deteriorating terms of trade for the net importing countries, reform of OECD farm policies is not in the interest of these countries. Indeed, consumers in the poorest countries would suffer large losses, and reform may aggravate the incidence of poverty.

It is instructive to examine these claims by discussing trade positions of the developing countries and the impact of policies on the relevant agricultural markets. First, we briefly introduce the farm subsidy programs in the OECD.

The overall support to agricultural producers through higher domestic prices and direct production-related subsidies was USD 228 billion in 2000-02 (Table 2). This level of the producer support estimate (PSE) is equivalent to 31% of the value of production. The bulk of the support went to milk, meat, cereals and sugar. About 63% of support came from the equivalence of border measures and market price support, and 37% from direct farmer subsidies. Aggregate levels and instruments of support in OECD countries vary significantly.¹

While the ratio of total PSE to production value has come down over the last decade, producer support in the EU declined only marginally. A stable aggregate hides changes to the composition of support over commodities. Based on 1995-2002 data from EAGGF, the EU agency that transfers the farm payments, Hoekman and Messerlin (2005) report strong reductions in subsidisation for cereals, tobacco, sheep meat and milk and dairy sector, relative to the value of production. The converse holds for fibre plants, rice and bovine meat, all products of interest to many developing countries.

Tangermann's key point is that farm support in the OECD countries is oriented towards temperate-climate products; on these markets many developing countries are not competing directly with OECD countries, with cotton as a notable exception. By nature, the developing countries encounter few support programs for their tropical export goods such as seafood, bananas, rubber, cocoa, coffee, tea and spices. On the global markets for fruit and vegetables there is direct competition but little producer support apart from border protection. However, in a number of crops where developing countries and rich countries are directly competing, domestic support in EU and US distorts global markets. Apart from cotton, this is particularly the case for tobacco and, to some extent, soybean and other oil crops (Bureau, Jean and Matthews, 2005). Current levels of farm support depress world market prices of these goods, and depress farm income in developing countries.

It is evident that importers of OECD cereals and livestock products are worse off when prices rise as a result of reduced distortions. But will prices actually rise as a result of reform? Upward pressure on prices occurs when policy reform will effectively reduce the volume of agricultural production in OECD countries.² Valenzuela et al. (2006) report on several model studies that record an enormous rearrangement of agricultural specialisation under full liberalisation, boosting agricultural value added in and nearly all developing regions (except India and Mexico), as well as Australia and New Zealand. Driving the change in international specialisation is the full elimination of farm support and farm trade

¹ For example, the share of border measures and market price support in total producer support is 35% in the US, 56% in the EU and 90% in Japan in 2000-03. The inverse is the share of subsidies.

² See the discussion on the economic implications of decoupled policies in the following chapter.

distortions results in a reduction of agricultural output in the high income countries in the range of 10% to 17% of output. However, the impact of farm support programmes in the OECD that are fully or partially decoupled from production decisions on production volumes brings little agreement among agricultural economists, Westhoff et al. (2004) observe. Hence, there remain critical questions on the extent to which trade liberalisation will result in substantial price rises on world agricultural markets.

Global cotton markets are severely distorted by farm support. Global market shares of US and EU are big enough to assume substantial upward effect on world price level from reductions to such support. As prices go up, current developing country exporters of cotton will experience a rise in the return to farming activity. The share of Sub Sahara Africa in global cotton trade could increase dramatically, although more cost efficient producers in Latin America may harvest even greater trade growth.

While it is likely that border price increases will be passed on to consumers in importing countries, the adverse effect on consumer prices is mitigated by the fact that importing countries simultaneously reduce their import tariffs (Aksoy and Beghin, 2005: 4). These results suggest that the negative welfare effects on net importing countries from policy-induced price increases should not be exaggerated.

In sum, the claims that reform of OECD farm and farm trade policies causes dismay in the low-income countries are largely based on aggregated analyses of static effects. Indeed, farm subsidies are much more distorting in market where the low-income countries are not competing with OECD countries, and they reduce the import bill of the importers. Yet there are notable exceptions that carry substantial economic weight. In addition, the policies have distributional consequences in the importing countries. While the domestic producers of substitutes for OECD's farm products are more deeply affected by the OECD's farm policies than country-level studies imply, the consumer benefits from lower-than-free-market world market price levels are perhaps exaggerated.

2.3.2 Export competition

Export restitutions are among the most distorting forms of agricultural support, which explains why the prospects for eliminating export subsidies and other type of distortions to export competition was heralded as an important first breakthrough in the Doha talks on agriculture. Such a reform would have especially strong implications for EU exporters. In fact, it brings the need to further reform the EU common agricultural policy in the same way that the Uruguay Round commitments on export subsidies did. Apart from the removal of restitutions, reform will put stronger discipline on related forms of distortions, such as export credits that contain elements of a subsidy (applied in the US), State Trading Enterprises and food aid.

Export subsidies, however, are small pieces of OECD support programmes, and they are also used by some middle income countries (Hoekman and Messerlin, 2006). The magnitude of export subsidies is determined by the gap between domestic price and export subsidies. Therefore, the most logical way to think about export subsidies is that their removal is a consequence of reductions to price-raising policies involving domestic support and border protection. Without addressing the reason for the existence of export subsidies -

low world prices due to large volumes of supply of programme commodities - the economic effect of their elimination will be largely symbolic.

Their reduction would surely increase the opportunities for developing country producers to gain market share on home markets and markets in other developing countries. In a world without export subsidies, however, the positions in global agricultural trade will not differ much from current patterns. There are no price effects to be expected that will bring about dramatic change; analysts expect significant upward effects on global prices of milk and sugar only (Hoekman and Messerlin, 2006; Aksoy and Beghin, 2005; Hoekman, Ng and Olarreaga, 2004).

Under the Uruguay Round agreements, 25 countries are allowed to apply subsidies on agricultural exports within constraints on maximum values and quantities of subsidised exports. There is a dramatic shortage of informative data on the actual use of export subsidies as user country's notifications to the WTO secretariat are incomplete and outdated. The most recent year in the data on which more or less comprehensive analysis is possible is the year 2000, on which a total amount of USD 2.6 billion used subsidies were reported to the WTO. The EU makes by far the most intensive use of export subsidies: restitutions to EU exporters exceeded 90% of all export subsidies in the years 1995-2000. Other high income countries account for 7% of used subsidies, and European middle income countries (some EU member states and Turkey) for less than 2%. South Africa, Colombia, Venezuela and Mexico have used subsidies between 1995 and 2000 but their use gradually reduced over those years.

Hoekman and Messerlin (2006) use plain trade shares in combination with count data on export subsidies to fuel expectations on gainers and losers from reduced use of export subsidies. They only examine the product markets distorted by (potentially) subsidised exports in EU, US, Canada.¹ Theoretically all countries that export temperate zone products have a strong interest in removal of export subsidies. Argentina is by far the country most affected by (and potentially the biggest gainer from removal of) export subsidies. Other countries include, in decreasing order of importance, New Zealand, Uruguay, Paraguay, Bolivia, Myanmar, Chile and Australia. Not surprisingly, the industrialised countries themselves, and other countries who combine membership of the G20 and Cairns groups such as Brazil, Thailand and South Africa seem to have a considerable interest in reforms under this pillar of the agriculture dossier. Net importers of the temperate climate products stand to loose from subsidy reduction due to adverse effects on their terms of trade. Indonesia, Malaysia and the Philippines (all three Cairns group members) are among the potential losers.

In the EU, export subsidies are called 'refunds' which suggests the subsidies compensate buyers for the high price of European goods. Over the time frame 1995-2002, the EU used export subsidies most intensely on cheese (19% of EU used subsidies), other milk

¹ Hoekman and Messerlin extend earlier work at the World Bank (Hoekman, Ng and Olarreaga, 2004) which counts the import goods or export goods that are potentially affected by export subsidies of one or more WTO members, and add the trade shares of these goods to arrive at the total trade that is potentially affected. Subsidy data (from WTO notifications over 1995-98) and COMTRADE trade data are matched at the 6-digit level of the Harmonised System classification. The analysis does not give bigger weight to the bigger actual use of subsidies on EU trade than potential US or Canadian use, which is much less, or Japanese use, which is nonexistent. Hence, the authors overestimate potential impact of current distortions.

products (15%), processed products (12%), and sugar (also 12%). Used subsidies strongly exceeded commitment levels for these products except for cheese. Further CAP reforms, in 2003 and following the WTO sugar panel, have reduced supply or intervention prices for dairy products and sugar, which allowed deep cuts in export subsidies. It appears that processed food products remain the most critical product group for export subsidies.

The EU maintains a system of export refunds on a wide set of processed agricultural products whose ingredients include CAP programme commodities, the so-called non annex 1 products. Exports of subsidised processed agricultural products from high income countries reduce the opportunities for import competition in the developing countries on goods with higher value added than basic agricultural commodities. Thus, there seems to be an agenda for research that examines the extent to which imports of subsidised food products impede the rise of agro-processing industries. A much broader issue, however, are the implicit export subsidies produced by domestic support programs and border protection: these boost production in the OECD countries, depress world prices but at the same time shield farmers in the OECD countries from world markets.

2.3.3 Market access

In the high income countries and in most developing countries, import tariff on agriculture are at least twice as high as industrial rates. In agricultural markets, border barriers are typically more distorting than support policies (Aksoy and Beghin, 2005: 3).

Table 2.3 compares tariffs for agriculture and non-agriculture or manufacturing trade. Tariffs reported include estimates of the ad valorem equivalent of specific tariffs. Tariffs are expressed as an 'ad valorem' percentage markup over the price of a traded good, and/or as a nominal duty per weight unit (e.g. 2 euro per ton) in case of a 'specific tariff'. The origin of specific tariffs, especially common in agricultural trade, lies in their flexibility to adjust border protection to volatile world prices. Applied tariffs are reported together with the binding overhang. The sum of applied rate and binding overhang is the bound rates which are the maximum tariffs under negotiation at the WTO. Applied rates are lower than bound rates because countries commonly apply less border protection than they are entitled to. Another cause is that most trade flows benefit from lower-than-common tariffs because they operate under some regional or preferential trading agreement. Hedi Bchir et al. (2005) estimate that the average binding overhang, for agriculture only, is equivalent to 3.6% (ad valorem) in the high-income countries, 29% in developing countries, and 87% in the least developed countries. The averages of tariffs reported reflect actual trade patterns.

Several patterns emerge from these data: agricultural tariffs are typically very high in Asian, at least in the high income countries and in some low income countries including India; tariffs are considerably high in Europe as well as a large set of middle income countries, most net importers of farm products; tariffs are low in a selective set of countries with a strong export orientation in the agriculture sector, including the US, Brazil and Australia. In several high income countries with a substantial farm production, border protection is especially strong for temperate climate products in order to screen competing imports; there are few impediments for agricultural goods in which there is shortage of supply such as tropical commodities and seafood products. The EU import regime for fruit and vegetables provides an instructive account of this pattern. Seasonal levies and sched-

ules for tariff duties ensure strong border protection during the harvest season in the EU, and minor barriers in the rest of the year.

Tariffs 'peaks' for products with strong interests in the domestic farm sectors proliferate in high income country agricultural tariff schedules, especially for temperate climate products. In addition, the exports of processed food tend to encounter higher tariffs than raw agricultural goods. The phenomenon, known as tariff escalation, features tariff schedules across high income and developing countries, and impedes the growth of processing industries in the primary exporting countries. For tropical exporters, many with few alternatives for industrial development, this further discourages industrial development.

Tariffs are by no means the only border distortion. Import competition is further restricted by means of tariff rate quota that grant market access at limited in-quota rates for a certain quantity, combined with a full rate for out-of-quota imports. TRQs protect 52% of farm production and 44% of farm imports in the OECD countries in 2000. Regarding some export products of the developing countries, TRQs protect 29% of oilseed imports, 47% of poultry meat imports, 60% of sugar imports and 58% of rice imports into the OECD (De Gorter and Kliauga, 2006: 120-3).¹ The TRQ protected sectors are typically also supported by means of farm payments or export subsidies. In view of partial liberalisations of farm support policies, a relevant question refers to which reduced distortions bring the largest benefits to the developing countries.

Preferential trade arrangements for exports from the developing countries into the high income countries provided the beneficiaries with better market access than competitors. In addition, the trade preferences granted by the EU provided exporters in former colonies and the least developed countries with opportunities for tapping into the producer rents created by CAP intervention prices. Sugar and banana exports from ACP countries into the EU are the classical example.² These benefits will decline under global trade reform, as preference margins erode and beneficiaries face increased competition on their export markets from low cost competitors. Critics of a strong preference erosion effect have pointed towards limited utilisation of preferences because of high transaction costs involved in administrative procedures (Tangermann, 2004). The recent evidence on utilisation indicates that utilisation rates are quite high in agriculture as opposed to textiles and clothing (Bureau, Jean and Matthews, 2005). This implies that any substantial opening of agricultural markets in the EU and other high income countries will result in significant economic effects from eroding preferences.

2.4 Tariffs or subsidies: which are more important?

Tariff peaks and other ways of border protection in agriculture are more widespread than the use of subsidies, as reported in this chapter. In addition, reducing border protection disciplines the ability of governments to employ subsidy programmes, in as far as budget

¹ Developing countries do not widely use TRQs; only a diverse set of thirteen developing countries use(d) the instrument to protect some non-tradable staples or products with strong political profiles, and most applied it loosely as a minimum access guarantee (Abbott and Morse, 2004).

² See, for example, Van Berkum, Roza and Van Tongeren (2005) and Mitchell (2004) on trade policies for sugar, and Borell (2004) on policies in banana trade.

outlays on market price intervention would rise together with expanding imports. While there is an evident case for reduced border protection, there are important interactions of farm policies. Most analysts agree that improvements in market access do the developing countries much more good than the reform of support policies but there are notable exceptions of, and preconditions for, this outcome (including that tariff cuts should open up markets in high income countries and developing countries alike). For developing country importers of cereals and livestock products from the high income countries, tariffs are the single line of protection against subsidised imports, hence it is critical that global tariff cuts and the reform of support go hand in hand.

Various analyses that apply a global economic model and the database of the Global Trade Analysis Project (GTAP) conclude that the developing countries have a much bigger interest in reduced border protection on agricultural markets than in the reform of support policies (Anderson, Martin and Van der Mensbrugge, 2006; Hertel and Ivanic, 2006; Decreux and Fontagné, 2006). The analyses underscore the expansion of demand in the OECD countries following reduced border protection for their agriculture sectors, which benefits some exporters in Latin America and Asia. Strong terms of trade losses from reducing domestic support programmes in the, mostly African, net food importing countries further shift the balance in favour of market opening.

While useful, these global economic analyses are very generic in terms of specific features of agricultural markets and individual countries. The next chapter explores the strengths and weaknesses of such analyses in view of development issues. Below, the results are summarised from two studies using partial equilibrium models that provide more detail.

Tariffs matter much more than subsidies for an impact on world prices. Although outdated in their treatment of EU and US policies, analyses at the Food and Agriculture Policy Research Institute (FAPRI) provide relevant insight into the world price changes following full liberalisation of various distortions. Fabiosa et al. (2005) find that a global elimination of subsidies has little upward impact on world prices in the hypothetical situation that all tariff distortions have first been removed, at least for meat, dairy and oilseeds. Cotton is on the other extreme, which is logical since the average global tariff rate is low at about 5% ad valorem, and domestic support to farmers in the EU, US and China summed to USD 4 billion to USD 6.5 billion annually over various years. On the world sugar market, arguably a theoretical construct, subsidies and border barriers determine 50% of the price effect. For course grains, border barriers explain 80% of the price effects resulting from reform.

Using a different approach, research at the World Bank arrives at the same qualitative conclusions. Hoekman, Ng and Olarreaga (2004) scrutinise a set of 227 agricultural commodities that benefit from domestic support or export subsidies in OECD countries or developing countries, out of a total of 900 agricultural commodities. They estimate the responsiveness of global net imports of these 'sensitive' products to changes in farm policies and world prices. In the model, imports will expand if policy reform results in reduced domestic supply and reduced consumer prices. Interestingly, the results suggest that export subsidies have about five times as much direct impact on global trade than domestic sup-

port - the implicit export subsidy element in domestic support is ignored.¹ Simulations of trade reform, involving 50% reductions of various instruments, indicate that the increase in trade and welfare across developing countries is much larger for a 50% tariff cut than for a similar reduction in export subsidies, and even less for cuts in domestic support. For expanding developing countries' welfare and exports, global tariff cuts have positive effects while, as a group, they are neutral to reductions in export subsidies and domestic support. Country results differ widely in line with the pattern identified by global economic models, and adding some detail. Because preferential access is ignored, the results understate the amount of losses in the developing countries that see their preferences erode, and overstate the static benefits from opening up OECD markets.

2.5 Effects of farm policies in the long run

Apart from the short run effects discussed above, OECD farm policies have some implications on the potential for agricultural growth and wider economic growth in the developing countries.

At face value, low world prices discourage developing countries from diversification into temperate climate products (Ingco and Winters, 2004: 13). The prime example is that of cotton production in Africa; the opportunities to supply cotton fibres from West and Central Africa to the world market would be much greater were it not for cotton subsidies in the US and, to a lesser extent, in the EU. Farm support programmes for cotton have their most distorting effects where they reduce exit incentives for oversupplying producers in developed countries and for the not-least-cost producers that benefit from trade preferences. Development strategies based on agricultural commodity exports must take into account that the entry of competitive producers from developing countries on world markets will not induce exit of noncompetitive producers as would happen in a liberalised market but result in larger volumes and depressed commodity prices (Aksoy and Beghin, 2004: 3).

A deeper understanding of the long run effects from OECD farm policies must be derived from an understanding of the drivers of agricultural growth and wider economic development. Meijerink et al. (2006) has recorded that current consensus states that capital accumulation, technological change and innovate capacity are necessary elements that must be embedded in a favourable setting of organisations and governance. Foreign trade and investments affect the incentives to innovate, imitate and use new technologies and thus countries' income levels are interdependent. While trade enables a country to make use of innovations abroad, import products and to export its produce, it exposes producers at home to international competition. Thus international trade does not necessarily increase national wealth or speed up growth (Helpman, 2004). Whether trade can encourage growth of income per capita depends on several factors. Lower trade barriers promotes growth

¹ Across all 227 commodities, Hoekman, Ng and Olarreaga (2004) find that the price elasticity of import demand lies between 1.5 and 2. In other words, imports would expand by 1.5 to 2% from a 1% drop in world prices. Of course, the responsiveness of import demand to subsidy cuts is much less because policy changes do not transfer one-on-one into price changes: the elasticity of import demand with respect domestic support is about -0.05; the elasticity of export supply with respect to export subsidies is -0.23.

when it is effected in combination with a stable and non-discriminatory exchange-rate system, prudent monetary and fiscal policies and corruption-free administration of economic policies (Baldwin, 2003). However, it is not evident that these conditions always prevail in developing countries.

It is unlikely that the farm and farm trade policies in the OECD will curtail capacity development or technology transfer on a wide scale. One case to be made, however, is that tariff escalation schemes may impede the development of a processing industry based on agriculture. To get the technology transfer necessary for agricultural growth and rural development, developing countries may rather want to open up their own borders for trade and investment in the agrifood sector.

Recently, several large agrifood corporates have invested in developing countries, including retailers attracted by emerging urban consumer markets, and producers that have identified export opportunities (notably in the trade of fresh fruit and vegetables). These corporates introduce new models for vertical integration in food supply, which have important spill-overs to the export sector. Before economic liberalisation in 1980s and 1990s meant the privatisation of agricultural institutions, a model of vertical coordination (VC) existed in many developing countries: production, processing, marketing, the provision of inputs and credit, retailing etc were all directed by the government. The dominant form of state-controlled VC was that of seasonal input and credit provisions to small farmers in return for supplies of primary produce. The dismantling of state-controlled VCs led to the decline of input and credit supply to farms. Recently, new forms of vertical coordination have emerged, through private vertical coordination systems, most of them initiated by a trans-national supermarket retailer. The number and scope of such supply schemes is growing rapidly as a response to consumer demand for food quality and safety on the one hand and on the other, the problems that (small) farms face to supply such products reliably, consistently and timely. Specifically for high-standard products, farmers might lack the expertise and have no access to crucial inputs such as improved seed. There are therefore major institutional constraints: the importance of VC in developing countries is further explained by the lack of efficient institutions and infrastructure to assure consistent, reliable, quality and timely supply through spot market arrangements (Swinnen and Maertens, 2006). VC can therefore be seen as a private institutional response to the above described market constraints.

Countries where producers implement the new standards-driven models for vertical coordination in the fresh fruit and vegetable sector have experienced positive development in the export sector, and spill-overs in terms of enhanced skills and organisation. This has resulted in traditionally staple crop producers building a position as exporter of fresh fruit and vegetable, such as Ethiopia, Uganda and Senegal.

2.6 Summary and discussion

This chapter has summarised the critical economic mechanisms that operate together to determine potential economic impact of global agricultural trade reform on developing countries. These are:

- (i) global supply reduces for programme commodities in OECD countries (wheat, grains), as farmers respond to the declined production incentives from domestic support and the phase-out of export subsidies. The resulting upward pressure on program commodity prices on global markets causes declining terms of trade for countries that are net importer of these commodities, and improving terms of trade for net exporters;
- (ii) global agricultural trade expands as tariffs come down and the constraints imposed by (tariff rate) quota are relaxed. Trade creation occurs as competitive producers reap market opportunities previously barred by trade measures, gaining market share on domestic producers in the countries opening up;
- (iii) the competitive producers gain market share on the less competitive producers that benefited, before reform, benefited from preferential access to OECD agricultural markets and now find that their trade preferences erode;
- (iv) increased competition and global consolidation of food supply induces technological change and productivity growth, making free available resources for alternative use. Structural changes are reflections of shifts of factors of production from one sector to the other.

Under effects (i), (ii) and (iii), market opening allows resources involved in agricultural production to flow to their most productive use, creating efficiency gains. The structure of the agricultural sector and the share of agriculture in GDP respond accordingly to price changes in factor markets (labour, capital) and national and international goods markets. The most-applied tools for economic analysis of trade reform are geared at this economic adjustment - often with a time horizon of 5 to 15 years. An additional effect, of type (iv), covers the possible impact of trade reform on the longer term, such as interactions between trade growth and the state of technology and institutions. Economists refer to these as dynamic effects, and have a hard time to incorporate them into their analyses at similar level of detail as the other, static, effects.

The evidence on direct (static) effects presented here supports the conclusion that the burden imposed by OECD farm policies on the developing countries as a group is limited yet unequally spread within the group. A key driver of that conclusion is the fact that, among the developing countries, only twelve countries are net exporters on the world markets for agricultural commodities, and nine out of ten countries are net importers. The countries importing the temperate zone export goods from the OECD countries, mainly cereals and livestock products, benefit to some extent from a lower import bill due to the program support for agricultural producers in the high income countries. However, the evidence is incomplete. The extent to which importers will actually face rising import prices is uncertain because the price effects of the restructuring of farm policies from production related support to a 'decoupled' single farm payment are unclear. Moreover, outside of the cotton case the economic literature falls short to provide serious assessments of the impact of (implicitly or explicitly) subsidised farm exports on agricultural production and trade, and the wider economy.

From a long run perspective, depressed world prices discourage entry of temperate crop producers, and reduce the exit incentives of developed country producers, possibly even to the extent that trade positions would differ if it were not for the present policies. To

speed up capacity development and technological change, developing countries can expect much more from opening up for foreign trade and investment than from the reform of OECD farm and farm trade policies. However, many uncertainties over the economic impact on developing countries remain.

In summary, due to terms of trade losses and preference erosion, for the wide majority of developing countries the interests in reform of OECD farm policies appear bleak unless the positive spill-over into technological or institutional change is considered. One must conclude, however, that the direct effects from trade reform tend to dominate the debate. In that perspective, key points for developing countries are that (a) global agricultural reform contributes to reduce substantial distortions within developing country agriculture; and (b) global agricultural reform is embedded in an all-sector liberalisation effort, in order to provide opportunities to make up the losses from agricultural reform in non-agricultural activities and markets.

In the negotiations on agriculture, subsidies and border policies are addressed as three separate 'pillars': market access, domestic support, and export competition. Analysts have attempted to inform the debate by examining the priorities for reform. Unequivocally, opening up markets for agricultural trade by reducing tariffs or related measures is deemed much more favourable for the global economy than reducing trade-distorting subsidy programs.

Too much focus on the three agricultural pillars obstructs a view on the connectedness of farm support, export subsidies and border tariffs. The agricultural policies in the EU and the US, maintain a system of intervention prices for selected commodities. (Japan largely relies on border measures to protect its domestic farm sector.) In the EU common agricultural policy, domestic support has been applied for market interventions that raise the domestic price above world price level. Border measures such as tariffs and tariff rate quota provide the necessary and sufficient protection to those countries that are less than self-sufficient, i.e. the net-importers. In most EU countries, for at least some commodities, however, the excess of supply over domestic demand creates export supply. Export subsidies are needed to reduce the price gap between world price and EU intervention price. Hence, to the extent that export subsidies facilitate that the surpluses in supply created by farm subsidies can be exported to the world market, the effects of these instruments should be analysed together, even though they are treated as separate elements under WTO negotiations.

Table 2.1 Food and agriculture trade of the developing countries, 2001-03

	Exports	Imports	Exports	Imports	Trade Balance
	(%)	(%)	USD billion	USD billion	USD billion
Tropical products					
Nuts	1.6	0.7	2.2	0.9	1.2
Sugar and confectionary	5.7	3.8	7.6	4.9	2.7
Coffee, tea, cocoa, spices	9.1	3.7	12.1	4.7	7.4
Textile fibres	4.6	9.4	6.1	12.0	-5.9
Subtotal	21.5	18.4	28.8	23.6	5.2
Temperate climate products					
Meat, fresh and processed	5.6	7.3	7.5	9.3	-1.8
Milk and dairy products	1.3	5.7	1.8	7.2	-5.5
Cereals, raw and processed	7.8	19.0	10.5	24.3	-13.8
Animal feed	5.5	5.4	7.4	6.9	0.4
Edible oil and oil seeds	13.1	14.9	17.5	19.1	-1.6
Subtotal	33.4	52.2	44.6	66.8	-22.2
Seafood, fruit and vegetables					
Seafood, fresh and processed	16.0	7.0	21.4	9.0	12.4
Fruit and vegetables (no flowers)	17.6	9.1	23.5	11.6	11.9
Subtotal	33.6	16.1	44.9	20.6	24.3
Other processed products					
Other products and processed food	3.3	5.5	4.4	7.0	-2.6
Beverages, alcoholic and nonalcoholic	4.1	3.5	5.5	4.5	1.0
Tobacco and cigarettes	4.0	4.2	5.4	5.4	-0.1
Subtotal	11.4	13.2	15.3	16.9	-1.6
Total food and agriculture	100.0	100.0	133.6	127.9	5.7

Source: ITC/PCTAS, author's calculations.

Table 2.2 Agricultural support in OECD countries, 2000-02 (x USD 1 billion)

Support	United States	European Union	Japan	Emerging supporters a)	Eastern European countries b)	Total OECD
Products that receive support						
Milk	11.25	16.11	4.63	2.53	1.03	40.14
Beef and pork	1.99	25.05	3.50	2.63	0.73	36.65
Rice	0.92	0.25	16.47	7.21	Na	25.00
Wheat	3.99	8.97	0.89	0.36	0.31	15.31
Maize	6.80	2.41	Na	1.32	-0.1	10.64
Other	22.02	39.40	22.00	16.46	2.45	99.81
Total producer support	46.97	92.19	47.50	30.49	4.41	227.54
Source of producer support						
Border measures c)	16.63	52.24	42.80	25.60	2.81	142.66
Domestic measures d)	30.34	39.95	4.70	4.89	1.60	84.89

a) Republic of Korea, Mexico, and Turkey; b) Czech Republic, Hungary, Poland, and Slovak Republic; c) Tariffs and tariff equivalents of other border measures; d) Direct payments to producers.

Source: Aksoy and Beghin (2005), table 3.3, based on data from OECD's PSE database, 2003.

Table 2.3 Market access

% ad valorem	Agriculture		Non-Agriculture	
	average applied tariff a)	average binding overhang	average applied tariff a)	average binding overhang
High income countries	24.0	3.6	3.2	0.7
Australia	3.2	1.9	5.5	5.3
Canada	29.2	0.3	3.2	1.2
EFTA	82.9	27.1	4.4	2.0
European Union	25.4	2.5	3.5	0.1
Japan	47.0	0.9	1.6	0.2
USA	8.5	0.3	2.6	0
Developing countries	31.2	29.2	9.7	10.3 b)
ASEAN	12.3	43.6	4.9	9.7 b)
China	55.2	0.1	13.9	0.2
India	59.7	76.0	28.0	12.5 b)
Korea	64.4	16.9	5.7	7.7 b)
Maghreb	34.5	34.5	24.9	14.6 b)
Mercosur	12.4	24.8	12.5	19
Mexico	38.7	24.3	14.2	21.1
OthSSA	33.9	81.1	11.4	18.4 b)
Pakistan	25.8	79.2	13.2	20.6 b)
SACU	20.7	38.0	7.7	9.9 b)
Turkey	39.3	47.8	3.8	7.7 b)
Least developed countries	15.5	87.1	9.5	19.3 b)
Bangladesh	20.9	152.4	5.1	18.7 b)
Sub-Sahara Africa LDCs	14.2	63.5	9.1	21.2 b)
World c)	26.6	13.6	4.9	3.7

a) Only for products that have bound tariffs. Tariff binding is universal in agriculture but not outside agriculture; b) Marks countries with binding in non-agriculture below 92.9% (WTO average). For these countries the tariffs reported in the table are incomplete; c) WTO members only.

Source: Hedi Behir et al. (2005).

3. Global assessments of economic impact of agricultural trade reform

There is a large body of recent quantitative assessments of economy-wide gains from multilateral agricultural trade reforms using global economic models. To the observer, it is perhaps worrying how similar are the expectations of trade analysts on possible economic effects of a trade reform under the Doha round. This chapter provides a non-technical review of the literature that assesses the worldwide economic effects of such a 'global' trade liberalisation. Its first purpose is to give insight into the range of results across several studies, for the global economy as a whole and for the developing countries. Its other purpose is to review the methodology and to arrive at an agenda for research into improving analytical methods.

3.1 Welfare effects from Doha round trade reform

The standard analytical tool for ex-ante assessment of global economic effects from trade reform under the Doha round consists of the combination of the database from the Global Trade Analysis Project (GTAP), and an applied computable general equilibrium (CGE) model of the world economy. Some of the most widely circulating quantitative economic analyses, including the annual 'global economic prospects' at the World Bank, are produced using this type of framework.

The applied CGE models and GTAP database provide a complete representation of the global economy. The key asset is a full specification of international trade relations between, say, 87 regions for 57 goods and services. CGE models are specifically concerned with resource allocation issues, that is, where the allocation of production factors over alternative uses is affected by certain policies or exogenous developments. International trade is typically an area where such induced effects are important consequences of policy choices. In the face of changing international prices, resources will move between alternative uses within the domestic economy, or even between economies if production factors are internationally mobile.

As the Doha round proceeded, GTAP-based analysis have informed the policy debate with a wide range of potential benefits and losses from trade liberalisation. Generally, the global economy-wide assessments predict positive welfare effects from trade reform, shared between industrial countries (2/3rd of the gain) and developing countries (1/3rd of the gain). Table 3.1 reproduces welfare gains and losses from agricultural trade reform from a set of influential studies that recently applied global economic modelling to the assessment of Doha round economic impact.

Model specifications and policy scenarios differ widely across studies. A brief comment on each in turn, starting with models. The Carnegie paper applies a GTAP framework that allows for unemployment rates to adjust to policy reform, in contrast to most applications in which the unemployment rate is fixed. Bouët et al.(2004) apply the MIRAGE

model (maintained at CEPII, Paris), incorporating (limited) vertical differentiation and imperfect competition in the food industry and other industrial sectors, to examine the impact of agricultural trade policy change. Hertel and Keeney (2006) advance standard model assumptions regarding the market for agricultural land, and interactions between cereal markets and livestock production. All three papers refrain in their model from the long run effects from trade reform, i.e. they assume that no technological change occurs, and they apply standard measures for price responsiveness of production and trade. The analysis by Anderson, Martin and van der Mensbrugge (2006) applies the GTAP-based LINKAGE model, which economists at the World Bank operate for forward-looking analyses. The model features reflect this purpose. For example, exports respond stronger in the LINKAGE model than standard GTAP applications to changes in international prices, reflecting a longer time horizon for economic adjustment and structural change.

Panel (a) of table 3.1 gives a take on a range of possible scenarios for a Doha agreement on agriculture. As far as the original papers allow, detail is provided on the pillars in the agriculture dossier (domestic support, export competition and market access), or regional distribution of the welfare impact. Looking at the policy scenarios under analysis, the paper produced by the Carnegie Endowment for International Peace (Polaski, 2006) assumes basic reform for market opening based on Uruguay Round-like linear cuts.¹ Bouët et al. (2004) examine tiered formula for market opening in agriculture whose features have a harmonising effect across tariff lines and more detail on farm support.² Anderson, Martin and van der Mensbrugge (2006) complement the tiered formula with exceptions for sensitive products; and deeper reductions of domestic support for heavy users. Two out of eight scenarios are reproduced in the table, of which scenario '2' represents the more ambitious agreement. Panel (b) of table 3.1 lists results from assessments of full agricultural liberalisation, i.e. the complete removal of all agricultural tariffs, quantity restrictions and trade-distorting subsidies. Because the policy experiment is similar, the difference in results between Hertel and Keeney (2006) and Anderson, Martin and Van der Mensbrugge (2006) has to be based in model specification.

As scenarios and models specifications differ across studies, so do the results. We focus the discussion on welfare effects, or the one-off changes in national income due to trade reform (see box 1). The estimated global welfare gains range from USD 56 to 182 billion under full global liberalisation, and from about USD 2 to 18 billion under partial liberalisation. In terms of fostering global economic expansion, it seems, trade reform is not your horse to bet on.

Under a possible Doha agreement on agriculture, the welfare effects on the developing countries lie somewhere between a loss of about USD 2 and a gain of about USD 0.5 billion. Developing countries share considerably less in the gains from agricultural reform,

¹ Note that, under the URAA, countries made extensive use of policy space in the agreement provided by a reduction formula specified in terms of an average cut. Large cuts on already low tariffs were combined with small reductions on high duties to arrive at the average cut. By ignoring that effect, Polaski overestimates the gains from such a reform.

² The harmonising formula was introduced as a modality for agricultural market access by Stuart Harbinson. It specifies three or four tiers, and cuts get bigger as one goes up the tariff ladder. Developed countries require deeper cuts than the developing countries. The tariff brackets and related reductions are applied to post Uruguay Round *bound* tariff rates.

compared to all-dossier assessments. In some experiments, the developing countries, as a group, suffer welfare losses. Such group results hide large country differences, however, and, as we will see below, even the sign of the group result is a poor predictor of country level result.

Some observers consider the attention on estimated dollar values of welfare effects a serious flaw in the policy debate. Relative to national income, the welfare gains from global trade reform are too small - in the range of 0.1% to 1% of world gross domestic product depending on the specification of the model and the liberalisation scenario - to explain the effort in achieving multilateral liberalisation. The real gains from trade relate to enhancing growth potential of the liberalising economies; this dynamic impact has proven difficult to assess in empirical ways. In addition, Taylor (2005) argues to reorientate the debate from net aggregate effects to the distribution of effects across those that, potentially, gain from reform and those that lose.

Where possible, table 1 decomposes the effects of a global (multilateral) trade reform from efforts undertaken only by a subset of countries. This allows the reader to get a feel for the distribution of interests across country groups. As theory predicts, OECD countries are the biggest gainers from agricultural trade liberalisation. The lion share of the gains from reform accrue to countries that liberalize their own policies: the removal of distortions causes productivity growth and consumer gains, an effect that works via the improved use of available factors of production and reduced consumer prices.

3.2 Effects on the developing countries

Both the World Bank study and the Carnegie paper provide a breakdown of effects of partial agricultural liberalisation for a number of developing countries. The welfare results are compared across both studies in table 2. The model specification differs substantially, and data grouping is slightly dissimilar. Although the policy scenarios differ, they are all fairly modest in terms of change to the status quo: the World Bank scenarios take a tiered formula approach as opposed to the linear 36% cut for developed countries (24% for developing countries) in the Carnegie paper; the World Bank paper includes sensitive and special products, which reduces both the scope (in terms of tariff lines) and the depth (the average cut achieved) of the trade liberalisation. The more modest World Bank scenario '3' is more equivalent to the Carnegie scenario. Both effectively leave protection intact across a wide range of protected products: the former through a wide range of sensitive products and the latter through limited linear tariff cuts.

The assessment of welfare effects on a regional basis is fairly similar across both studies: the direction of welfare effects is equal for the analyses under World Bank scenario '3' and Carnegie's Doha scenario, and results are of similar order.¹ The welfare effects reported in table 3.2 provide quantitative support for the hypothesis laid out in the previous chapter: countries' trade position in temperate zone agricultural products largely predicts their static welfare effects from trade reform; welfare gains occur in net exporting countries while net importers encounter welfare losses. While the welfare effects reported in table 3.2 are limited, it is important to be reminded that the reforms implied by the scenarios lack ambition. Moreover, the direction of effects in global economic analysis should generally receive more attention than dollar estimates of welfare. What follows briefly discusses the results of table 3.2 for three developing regions, against a background on results of trade reform in manufacturing, textiles and services.²

Africa

African countries generally suffer from agricultural trade reform. A rising import bill for cereals and livestock products from the OECD countries dominates the effects in the Middle East and North Africa region and in Sub-Saharan Africa. Both regions suffer strong welfare losses, especially in the World Bank analyses, mainly as a result of cuts in export subsidies and rising food prices. Selected countries in southern and eastern regions of the African continent benefit from increased export opportunities for high value exports such as fresh fruit and vegetables. Non-agricultural trade reform induces a shift of resources currently tied in manufacturing into two directions: first, we find expansion of the services sectors; second, the simulations indicate growth of food production (not so much agriculture), which confirms the insight that value adding to agriculture renders good prospects for economic growth in the region. Adjustment is painful, however, as indicated by substantial terms of trade losses in the North Africa and Middle East region and the Sub-Saharan Africa region. Such losses largely find their origin in the erosion of preferential access to the EU and other high-income markets.

Developing Asia

China's reliance on cereal and livestock imports will increase with per capita income, and reforms that push world prices upwards will have a negative impact on the Chinese economy. World Bank estimates welfare losses at 1.5% of GDP, Carnegie's estimate is much more conservative. The economic importance of non-agricultural market access (NAMA) and services reform dwarfs the effects from agriculture. For example, China's textile output

¹ Some information was lost in this comparative setup. First, AMM singled out Turkey from the other Mediterranean countries, and surprisingly found nil aggregated welfare effects under both scenarios. Second, the transition economies were ignored in the table because Polaski does not report them. AMM, however, report substantial welfare losses for Russia to the amount of USD 0.7 and 0.8 billion, for scenarios 2 and 3 respectively. Russia is not a member of WTO, and suffers terms of trade losses under 'global' trade reform: they encounter increased competition on export markets from nearly all countries and rising import prices for program crops.

² The discussion on the effects of non-agricultural reforms is based on unpublished material at LEI, which applied the GTAP 6 database to policy scenarios reflecting the state of play in the Doha round in November 2005. One of the core elements was a Swiss formula for reform in non-agricultural market access with alternative maximum post-Doha tariff for developed (10% ad valorem) and developing countries (15%).

is expected to expand by 14% so as to arrive at a global market share of 25%. India, Indonesia and Thailand are developing Asia's three net exporters of temperate zone products, which experience modest benefits from reform. Developing Asia stands to gain heavily from reducing the rates of protection in textile markets and other manufactures. The low-income Asian countries, as a group, shift resources out of agriculture into textiles production, causing output to expand by 16%. India, however, faces strong losses as its tariff barriers for manufactures and food products come down, inducing especially large adjustments in other manufactures and the metal industry.

Latin America and the Caribbean

Argentina and Brazil are the biggest beneficiaries of global agricultural trade reform, whose performance is somewhat curtailed by lack of ambition in agricultural market opening in the OECD countries. Many other countries in the region, including net exporters such as Paraguay and major exporter Chile, benefit to some extent from rising prices or improved market access. In the Caribbean and Central American region, the eroding value of preferential access to the EU market is compensated by market opening in Mexico, one of the worlds largest agricultural importers. Under an all-dossier reform, all regions on the subcontinent experience a drive to move resources out of light manufacturing and into food production and services delivery. Some countries in South and Central America are currently locked into inefficient modes of industrial production, as indicated by strong terms of trade losses from NAMA reform.

3.3 An agenda for making models more relevant for policy analysis

Recently, several overviews and critical assessments were published on the use of global economic models for the assessing the economic impact from trade reform (Ackerman, 2005; Charlton and Stiglitz, 2005; Taylor, 2005). Theorist Lance Taylor may strongly criticise the GTAP framework for its lack of macroeconomic validity,¹ his constructive review teaches the valuable contributions to be made by the global economic models using GTAP data. Global economic models contribute quantitative and economically consistent analysis to the policy debate on trade liberalisation. As far as the criticism goes, two important conclusions are to be drawn.

First, the Global Trade Analysis Project (GTAP) is perhaps getting too successful: the fact that so many analysts and policy advisors alike depend on similar methodology and data is frustrating a lively debate on the benefits and downsides of trade liberalisation. In part, this is because of the foundation of the global economic models in neoclassical economics, which has a free-trade bias. Still, these global economic models - like all economic models - are poorly suited to address long term effects from reform, which is the stage for the biggest potential welfare gains. Second, studies using global economic models unequivocally downplay the importance of agricultural trade reform vis-à-vis the liberali-

¹ In a review of global economic models for OXFAM, Taylor (2005) claims that GTAP based assessments of trade liberalisation impact warrant caution because the method used is highly selective in the insights that it incorporates from macroeconomics. His critique largely addresses the World Bank because of the high profile of their work.

sation of trade in manufactures and services. These trends push those who are not a priori in favour of trade liberalisation, and in particular of agricultural trade liberalisation, on the defence.

Several methodological improvements are considered of critical importance to arrive at global economic analyses that are more relevant to the policy agenda for sustainable development, summarised by the millennium development goals of the United Nations. Before describing the agenda for making models more relevant for policy analysis, the point is made that alternative analytical frameworks should become more vocal in the trade and development debate.

Contributions from other economic frameworks provide direly needed input, including analyses based on from structuralist economics, evolutionary economics and studies that place trade reform in historical or institutional perspective. For example, Taylor (2005) analyses the impact of trade reform in a CGE model from a structuralist perspective. Structuralists acknowledge that permanent underemployment of labour resources is a better reflection of labour markets in developing countries than full (or fixed) employment. In a structuralist framework, policies aimed at growth of domestic purchasing power will have large positive second-round effects. As demand is the key to growth, structuralists tend to focus on a domestic supply response to satisfy expanding demand, so as not to 'leak' purchasing power. Such analyses often arrive at arguments for reducing import competition.

The understanding of institutions and their implications for the design of a policy mix for economic development are deepening. For example, Koning et al. (2006) combine sociological, economic and historical perspectives to examine power balances in agricultural markets in Kenya and Bolivia. The articulation of private interests is seen to have implications for the trade policy positions of these countries in the WTO. It is important to recognise that institutions are in a constant state of evolution (Meijerink and Eaton, 2006). The pace of this change may however be admittedly slow in many instances, and certain institutional configurations might become 'locked-in' for long periods of time. This might have negative effects on investment choices by biasing the choices of entrepreneurs and individuals away from potentially more profitable opportunities created by trade reform (leading to efficiency losses over time i.e. in a dynamic sense). Others may be excluded or hindered from engaging in risky but potentially promising new lines of activity. The result is an economy in which various networks and groups serve to replicate themselves and the status quo, and showing less-than-potential response to a trade policy change.

Despite the limitations of the global economic modelling tools, their analytical strength remains a major asset. As the agricultural sector is in the limelight of poverty analysis, detailed analysis will be required to link trade reform to the agricultural sector, the abundant linkages of agriculture to other economic activities, and agricultural policies. Hence, the methodological improvements are strongly focused towards agricultural markets and policies.

Labour markets and unemployment

The labour market is one of the keys to understanding the effects of trade policies on the household level, as will be discussed in the next chapter. Ignoring persistent wage differentials between agriculture and non-agriculture over a long period of time, global economic models often fail to address the complexity of agricultural labour markets, which requires

different assumptions about the mobility of agricultural labour and allowing unemployment. Under the standard applied CGE model labour is perfectly mobile across sectors. To capture the wage differentials between agriculture and non-agriculture requires segmented factor markets for labour and capital. Such was the approach in the recent study by the Carnegie Endowment for International Peace (Polaski, 2005); by including unskilled agricultural labour as a factor of production, the Carnegie model allows differentiated response to trade reform of labour demand and wages in urban and agricultural settings.¹ Furthermore, global economic models could allow for unemployment through defining a complementarity problem. This allows real wages to remain constant in a situation of rising labour demand, as long as there are unemployed people. After full employment is reached, real wages may increase.

Land market

The functioning of the land market is a pivotal determinant of a region's response to a reform of agricultural trade policies. Yet, the representation of the land market in global economic models is often very basic: in the standard global economic models using GTAP data, the total land supply is exogenous, which implies that agricultural land cannot convert into other uses or vice versa. However, in developing countries there are many examples of volumes of agricultural land that respond to (the wealth or lack of) economic opportunities, including the deforestation for agricultural purposes or the loss of arable land due to urbanisation. Recently, Hertel and Keeney (2005) and Van Meijl et al. (2006) have implemented more advanced land markets in their analysis, making use of a land supply curve, which specifies the relation between land supply and a rental rate. Land supply to agriculture as whole can be adjusted as a result of idling of agricultural land, conversion of non-agricultural land to agriculture, conversion of agricultural land to urban use and agricultural land abandonment (see, Van Meijl et al., 2006). Another area of potential progress relates to more realistic assumptions regarding the substitutability of types of land given the agronomic features of the land.

Representation of farm policies and farm trade policies

Relevant quantitative policy analysis requires an acceptable methodology and a proper representation of the policy change. As OECD agricultural policies have a critical impact on developing country agriculture, there is an urgent interest in a proper representation of the EU's common agricultural policy, the US farm bill and other farm policies in applied trade analysis.

One policy instrument that currently challenges economic modelling is that of 'decoupled' farm support. There is no question that US and EU decoupled payments provide much weaker incentives for farmers to expand supply than fully output-related payments. However, the exact impact is uncertain. Decoupled payments do give way to a remaining risk reduction that induces farmers to expand or maintain supply. Some analysts maintain as a rule of thumb that one euro of decoupled payment provides farmers with a similar output incentive as four euro of output related support. The typical trade modeller will implement decoupled payments through a shift of coupled payments dependent on the vol-

¹ The specification of labour markets in the Carnegie paper has evoked strong criticism from academic peers.

ume of output to a decoupled payment which reduces the user costs of inputs, mainly agricultural land and labour.

Specific commodities come out consistently awkward in simulations, typically because policies are not well represented. Generally, these are the commodities for which trade is most distorted. Rice trade generally responds strongly in global reform scenarios, for example with a 35% expansion of global trade volume in Hertel and Ivanic (2005) assessment of a partial liberalisation under a Doha agreement. Key to the growth of rice trade is the reform of policies in the highly protected markets of Japan and Republic of Korea. The political economy of the liberalisation of protected industries is that domestic parties to the reform will defend their interests by means of more subtle measures or, at the very least, by slowing down the speed of reform.

Quota, limits on quantities of the volume produced or traded, are notorious for their difficulty in economic modelling. Quota are abound in EU market policies for sugar and milk. An experiment that involves quota liberalisation forces the analyst into making assumptions with little theoretical backing. For example, the effect of removing quota or tariff rate quota (TRQ) depends on the distribution of 'quota rent': a quantity restriction in trade creates scarcity and thereby higher than free-market prices; the economic benefits may be harvested by importers or by exports or be shared by these agents. One way to address quota in global economic models using GTAP data is to formulate quotas as a 'complementarity problem.' This formulation allows for endogenous regime switches from a state when the output quota is binding to a state when the quota becomes non-binding under any reform scenario with lower support prices and/or changes in the amount of quota.

Global economic modelling is the art of mapping economic mechanisms and aggregate impact. Policy simulations often lack institutional or policy detail, and reports often fail to produce an expert qualification of the feasibility of model outcome. Such misrepresentations warrant caution for assessments of trade liberalisation impact on agricultural markets with highly detailed policies, such as sugar, milk and dairy, and bovine meat products.

3.4 Summary and discussion

Global economic models that apply a general equilibrium framework and the GTAP database, for all their shortcomings, contribute quantitative analysis to the policy debate on trade liberalisation. This is all the more important when many of the economic effects of trade liberalisation on developing countries are theoretically undetermined. In agriculture, unlike other sectors, other countries' policies have effects on the liberalising country that may warrant caution for a coordinated liberalisation effort involving several countries. The results from global models could lead the way, if and when sensibly applied and interpreted.

In terms of fostering global economic expansion, agricultural trade reform is not your horse to bet on. Based on a selection of influential assessments of economic impact, one may conclude that there are few gains to be had from agricultural trade liberalisation. For the developing countries, the carrot for participation in a global agricultural liberalisation is

even smaller as their share in the gains from the total elimination of agricultural distortions is smaller than the high income countries.

The reforms implied by scenarios for a possible Doha agreement on agriculture lack ambition, especially concerning market access: some apply linear tariff cuts, others offer large exceptions for tariff cuts to highly protected sector. For a proper assessment of the effects of reform to domestic support or export competition, generally the results from global economic models using GTAP data must be interpreted with caution because of the limited level of detail.

Under a possible Doha agreement on agriculture, developing countries as a group will likely incur some losses, or a modest gain. The effects of agricultural trade reform are generally too small to have an overriding on trade or development. The global models applied at the World Bank and the Carnegie Endowment for International Peace provide quantitative support for the hypothesis that countries' trade position in temperate zone agricultural products (cereals and livestock products from the OECD countries) largely predicts their (short term) welfare effects from trade reform; welfare gains occur in net exporting countries while net importers encounter welfare losses. African countries generally suffer from agricultural trade reform. These regions incur potential losses of 0.1 to 1.5% of GDP, as the northern and sub-Sahara regions experience rising import costs and eroding trade preferences. Selected African exporters will benefit from trade expansion of high-value agriculture. In Asia, the economic importance of non-agricultural market access and services reform dwarfs the effects from agriculture. In China, rising import intensity for temperate zone products in combination with price rises causes losses to the extent of 0.3 to 1.5% of GDP. The low-income countries in Asia shift resources out of agriculture into labour-intensive manufacturing, thus increasing agricultural imports. The Asian agricultural exporters stand to gain from reform, but the extent to which they deepen their specialisation differs between analysts. Less heroic assumptions on the price responsiveness of exports results in more modest export and welfare effects. The current agricultural exporters in Latin America are the biggest beneficiaries of agricultural trade reform. Although curtailed by a lack of ambition in trade reform, Brazil and Argentina harvest potential gains of 0.3 to 1.1% of GDP as they deepen their agricultural specialisation. Some other net exporters, such as Paraguay, Chile and Bolivia benefit from rising agricultural prices and market opening in Mexico, one of the world's largest importers of food and feed. An all-sector trade liberalisation will possibly drive more resources into agriculture, as the relatively productive sector in Latin America.

A key point for developing countries is that agricultural reform is embedded in an all-sector liberalisation effort, in order to provide opportunities to make up the losses from agricultural reform in non-agricultural activities and markets.

The policy debate on trade liberalisation is driven strongly by global economic analyses. This is a setting that pushes those who are not a priori in favour of trade liberalisation, and in particular of agricultural trade liberalisation, on the defence. Global economic models have biases against measuring the diversity of economic impact across countries or sectors in detail. However, at the aggregate level the potential losses of agricultural trade reform appear small while they are pertinent in some regions or for selected groups in society.

Several methodological improvements are considered of critical importance to arrive at global economic analyses that are more relevant to the policy agenda for sustainable development. A key area of interest is the distribution of welfare effect at regional and household level in order to get a better perspective on the poverty impact of reform. The next chapter discusses the state of knowledge on trade and poverty. Also, improvements in the representation of domestic markets in the developing countries are a necessary condition for making global economic analyses more relevant. Policy shocks are transmitted to households through markets for goods and factors of production (capital, land and labour), and much of the transmission requires further exploration. Finally, farm and farm trade policies are among the most complicated interventions. Given the pivotal importance of agriculture for employment and growth in the developing countries, and the focus on agriculture in the trade negotiations, applied analyses need to represent policies with due care and avoid simplifications.

The macroeconomic effects of changes in policies are typically assessed by the well-established welfare economic compensation measure, and this is also the measure that is used in this report. The so-called equivalent variation (EV) measures 'what change in income would be equivalent to the proposed policy change.' In other words, the EV is the amount of income that should be given to (or taken away from) households to achieve a welfare that is similar to that which occurs when a certain policy change comes into effect. This measure always informs us about the potential welfare change and it does not inform us about distributive effects. In fact, if the EV is positive, we know that enough resources are mobilised such that the winners from the policy move can potentially compensate the losers. The EV is firmly grounded in the welfare economic literature, and provides the ultimate measure of economic impact of a policy change. (While the EV takes the new situation as a reference, the alternative measure known as Compensating Variation (CV) takes the old situation as the reference. It asks the hypothetical question: 'What is the minimum amount of compensation after the price change in order to be as well off as before the change?')

Box 3.1 Equivalent variation

Table 3.1 Welfare effects of agricultural trade liberalisation from global economic studies a)

Study (main affiliation of the authors)	Agricultural liberalisation experiments and decomposition (reference in the original paper)	World (x USD 1 billion)	Developing countries (x USD 1 billion)
Bouet et al. (2004) (CEPII) b)	'Doha'	2.3	0.5
	- Market access: tiered formula, maximum tariff reduction 60% (40% for developing countries), no sensitive/special products	1.7	0.4
	- Export competition: removal of all export subsidies	0.0	0.0
	- Domestic support: 55% reduction of AMS ceiling	0.6	0.1
Polaski (2006) (Carnegie Endowment for International Peace)	'Doha scenario for agriculture'	13.4	-0.3
Anderson, Martin and Van der Mensbrugge (2006) (World Bank)	'Scenario 2'	17.7	-0.4
	60-75% reductions of AMS ceiling, removal of all export subsidies, harmonising formula with maximum tariff cut 75% (60% for developing countries), sensitive products 2% of tariff lines, special products 5%		
	'Scenario 3'	13.4	-1.7
	60-75% reductions of AMS ceiling, removal of all export subsidies, harmonising formula with maximum tariff cut 60% (40% for developing countries), sensitive products 4% of tariff lines, special products 10%		
Anderson, Martin and Van der Mensbrugge (2006) (World Bank)	'Full liberalization'	182	54
	- reform only in industrial countries	135	26
	- reform only in developing countries	47	28
Hertel and Keeney (2006 (Purdue U.))	'Removing all agricultural tariffs and subsidies'	56	14
	- reform only in developing and transitional countries	8.0	3.2
	- reform only in industrial countries	48	11
	- only market access in industrial countries	44	12
	- only domestic support in industrial countries	2.8	0.4
	- only export subsidies in industrial countries	1.0	-1.5

a) Doha scenarios for partial agricultural trade liberalisation; b) Complete elimination of agricultural trade distortions.

Notes: a) Welfare effects are one-off changes in national income, based on equivalent variation, in 2001 dollars unless specified otherwise; b) In 1997 US\$.

Source: papers mentioned in the table.

Table 3.2 *Welfare effects of agricultural trade liberalisation, per developing region a)*

(x 1 billion US\$)	World Bank		Carnegie	
	scenario 2 a)	scenario 3 a)		doha for agriculture a)
<i>Africa and Middle East</i>				
Middle East and North Africa	-1.2	-1.5	Middle East and North Africa	-0.2
Turkey	0	0		
Selected Sub-Saharan Africa b)	0	0	East Africa c)	-0.1
Rest of Sub-Saharan Africa	-0.3	-0.3	Rest of Sub-Saharan Africa	-0.1
South Africa	0.3	0.1	South Africa	0.1
<i>Asia</i>				
Bangladesh	0	0	Bangladesh	0
China	-1.5	-1.6	China	-0.3
India	0.2	0.2	India	0
Indonesia	0.2	0.2	Indonesia	0
Thailand	0.6	0.3		
Vietnam	0	0	Vietnam	-0.2
Rest of East Asia and Pacific	0	0		
Rest of South Asia	0.1	0.1	Rest of South Asia	0
<i>Latin America</i>				
Argentina	1	1	Argentina	0.4
Brazil	1.1	0.9	Brazil	0.3
Mexico	-0.3	-0.3	Mexico	-0.2
Rest of Latin America and the Caribbean	0.5	0.5	Rest of Latin America and Caribbean	0.1
<i>Total</i>	<i>0.7</i>	<i>-0.4</i>		<i>-0.3</i>

a) See previous table for sources and definitions of the scenarios; b) Botswana, Madagascar, Malawi, Mozambique, Tanzania, Uganda, Zambia and Zimbabwe; c) Tanzania, Uganda, Malawi.

4. Poverty and agricultural trade reform: pieces of the puzzle

'If trade liberalization and poverty were both easily measured, and if there were many historical instances in which liberalization could be identified as the main economic shock, it would be simple to derive simple empirical regularities linking the two. Unfortunately, none of these conditions is met [...]. (Therefore) in the absence of clear empirical regularities, we need to develop a theory of how trade shocks might translate into poverty impacts in order to consider how plausible such links look in the light of what we do know about the way economies function; to identify the places in which it would be sensible to seek empirical evidence; and to help us to fit the jigsaw puzzle of fragmentary evidence into a single overall picture. It will be obvious [...] that tracing the links between trade and poverty is going to be a detailed and frustrating task, for much of what one wishes to know is just unknown. It will also become obvious that most of the links are very case specific.' (Winters, 2000: 43)

There are strong links between agricultural trade and poverty. Most crucial is the very high share of agriculture in total employment in developing countries, constituting 53% of the total workforce in 2004. In Sub-Saharan Africa even 60% of the economically active population works in the agricultural sector (FAO, 2005). For poor households, agriculture is the main source of income, and food products are the main expenditure. Hence, changes on food markets due to liberalisation of agricultural trade in developing countries affect households in developing countries in many ways, and are pivotal the poor. Agricultural growth is crucial for sustainable poverty alleviation in rural areas. In 2003, agriculture constituted 11.5% of GDP in developing countries, compared with only 2.4% in developed countries. Those earning an agricultural income typically complement earnings with non-agricultural income (Kuiper et al., 2006), hence a multisector reform will affect farm households in many ways. The proper understanding of the consequences of agricultural trade liberalisation on poor and vulnerable people in developing countries is, therefore, as much based on impact of the agriculture economy as on the linkages of farming to other activities. Mainstream global economic modelling does not provide detailed information on the distribution of the welfare effects below the national level.

Recently, some analysts at the World Bank boldly estimated the poverty effects from trade reform (measuring poverty in its most basic dimensions, see box 1 for discussion). A complete global trade liberalisation may push 24 million to 44 million people out of poverty (i.e. above the 1 dollar poverty line). That is equivalent to a reduction of the poverty incidence in developing countries from 10.2% of the population to 9.5-9.8%. The poverty alleviating impact of a partial trade reform in agriculture is much smaller: a Doha agreement on agriculture may perhaps reduce the incidence of poverty by half a million people; worse, a Doha agreement will make no contribution to poverty reduction in Sub-Sahara Africa.

It is neither wise nor intended to take these numerical estimates (from Anderson, Martin and Van der Mensbrugghe, 2006, p.382) too literally. The fact that the World Bank produces such analyses is best interpreted as an indication that the distributional consequences of trade reform have entered the centre stage of the policy debate on trade and development. Moreover, the evidence presented in this chapter on the complexity of the trade-poverty links and the ongoing quest for sound methodologies in the field, renders these numerical estimates as premature attempts - imperfect numbers, soon to be replaced by improved ones.

This chapter examines some of the pieces of the trade-poverty puzzle with the focus on agriculture. The previous chapters found a wide diversity of economic impact from agricultural trade reform on the agriculture economy (chapter 2), and on the wider economy (chapter 3). What follows describes how agricultural trade reform changes the welfare position at household level, where effects are infinitely diverse. This chapter reports on the current methodological discussion about measuring the poverty impacts of trade reform. Five years ago the research on trade and poverty was still in its infancy. With the start of the Doha Development Round in 2001 the subject received growing attention from the research community, which resulted in a rapid expansion of the applied literature on the relation between trade and poverty.

4.1 Tracing the linkages of trade and poverty

The citation by L. Alan Winters, one of the world's most renowned and productive analysts in the field of trade and poverty, makes clear that tracing the links between trade and poverty is a difficult task. The main reason is the fact that the poverty situation of people is influenced by many factors, and isolation of these factors in order to study the impact of a single factor is impossible. In a rare example of an ex-post evaluation, Litchfield et al. (2003) explain the difficulties in disentangling the poverty effects of trade reform from other shocks, such as demographic changes, environmental (weather) shocks and other shocks (such as constrained physical access to markets due to damaged roads). Also, there is no natural end point to an economic restructuring, in order to determine the balance of employment and income effects. Following Winters' recommendation, the best thing to do is try to fit the puzzle piece by piece, as the linkages between trade and poverty are numerous and diverse.

A useful approach is to place the trade and poverty links on a time line, as successive reactions by economic agents, and on markets to a change in trade policy. The literature suggests three types on a continuum.

First-round effects are described as the immediate impact of a policy change on the prices and quantities on the product market. A tariff cut on poultry meat will directly reduce the domestic price of the imported product, and cause consumers to demand more of the imported meat. The increase in the imported volume, and the decline of demand for domestic poultry meat, or an alternative protein, is determined by the price elasticity of imports.

Second-round effects are described as the adjustments of households to the first-round effects. In the process, factors of production shift to different use: capital is rein-

vested, employment opportunities shift, alternative crops are grown on agricultural land. The supply and demand on the product markets responds accordingly. To continue the example, some poultry farmers will be induced to move into aquaculture, or shift to produce fish feed, or take up other employment. Adjustment may be painful, and possibly even counterproductive, as some of the liberalisation efforts in the 1980s and 1990s have demonstrated. There is widespread consensus that side-policies must be in place to steer towards beneficial impact, and to cushion vulnerable households from the worst consequences.

Long-term effects on trade reform on poverty consider the contribution of economic growth to poverty reduction. The study of trade liberalisation and poverty presumes that policy reform will reduce economic distortions and thereby enhance the potential for economic growth and development. Speeding up growth will involve an expansion of labour demand, and enhance purchasing power even in a situation of population growth. Economic growth is presumed to be the most favourable condition for the sustainable alleviation of poverty.

It may be clear that the impact of trade reform may differ among households. Therefore it is important to realise that there is no such thing as 'the typical household'. The economic situation of households in developing countries may differ according to the extent to which the household members are producers, consumers, labour providers, land owners or capital-owners. Additionally, not only rural households are affected by agricultural trade reform, urban households may also be affected, especially when food makes up a substantial share of their spending. In a recent study four broad categories of households are identified when the impact of agricultural policy reform is measured. A first important distinction is made between commercial and non-commercial farm households, while two additional categories are agricultural wage earners and urban households (OECD, 2006).

A simple analytical framework

The purpose of ex ante analysis of the poverty effects from trade reform is to understand the many factors that influence economic growth potential and household impact.

Studies that made important contributions to the analytical framework on the first and second round effects of trade reform on poverty include OECD (2006, 2003), McCulloch, Winters and Cirera (2001), and Winters (2000). Based on these contributions, figure 1 presents the current state of knowledge in a diagram of linkages between global and national markets, economic decisions in households, and policy impact. The framework presents the theoretical linkages that exist between world market liberalisation and household level poverty impacts across four levels. It reads top-to-bottom: world price or policy changes enter the system from the top (1), the interplay of border prices (2) with domestic factor and output markets (3) determines impact at the bottom scale, i.e. the household level (4).

Progressively, analysts are turning to the quantification of the trade and poverty linkages. The global economic analyses described in the previous chapter have produced a wealth of trade analysis on welfare effects and changes to specialisation patterns, largely focusing on levels (1) and (2). The body of literature that links levels (3) and (4) to this work has received a tremendous boost from institutions such as the World Bank, DFID and, more recently, the OECD. Some good case studies are available; several apply global

economic modelling with some module for poverty assessment, as applied in the World Bank publication by Hertel and Winters (2005); others focus on models for the interplay between national markets and household level impact, and include detail on household types, spatial impact or institutional settings of reform (OECD, 2006).

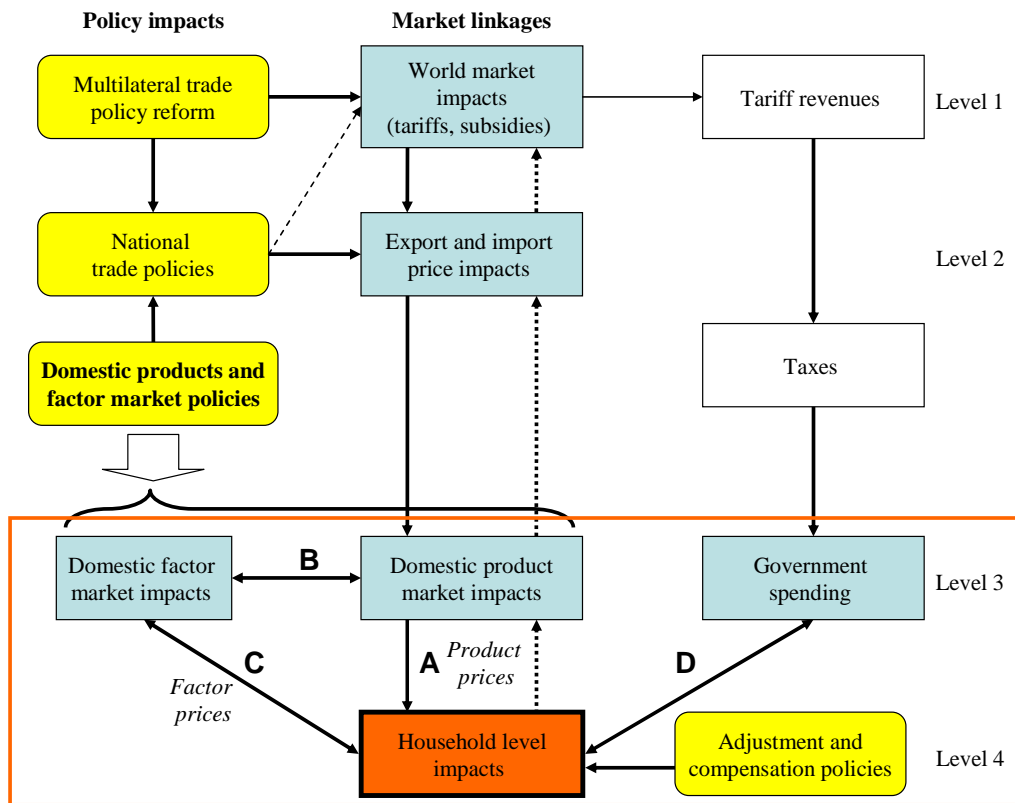


Figure 4.1 Linkages between markets, households and policy

The following paragraphs will discuss in more detail how trade reform may affect income and expenditure at the household level. The different linkages between domestic markets and household impact are illustrated using material from Hertel and Winters (2005) and OECD (2006), two recent milestones in empirical work in this field.

The main question in this respect is how a change in border prices affects the poverty situation of households. Returning to figure 1, we will focus on the links within the orange framework, within which four linkages (A, B, C and D) can be identified. Each of these links will be discussed by presenting a theoretical introduction and results of empirical case studies. It will be shown that the analytical gaps on the trade-poverty links are increasingly well-defined. Hertel and Reimer (2005) in this respect have presented a list with 'directions for further research'. They argue that research needs to be focused on missing

markets and factor mobility; characterizing consumer behavior; transaction costs and price transmission; data reconciliation; and tax revenue and transfer payments.

Several of the issues mentioned by Hertel and Reimer will be discussed below. First the issue of how price changes at domestic markets influence the incomes of households is discussed (link A).¹ After that the issue of factor mobility and market failure is addressed (link B). Third, the decision-making within the households on employment, production and consumption following changing factor prices is discussed (link C). And finally the issue of fiscal replacement of lost tariff revenues and the impact on households is dealt with (link D). Examining 'the plausibility of links given our knowledge of how the economy works' (citation Winters), below the four mentioned issues are discussed.

Figure 4.1 oversimplifies reality, mainly in three areas. Causalities can run both ways rather than top-to-bottom only. For instance structural changes in households' decisions may affect local markets. Also there are general equilibrium effects at each stage of the framework; direct price changes induce certain decisions within the households which result into second-round effects until an equilibrium is reached (e.g. higher wages or profits may change consumption patterns of the concerned households). Furthermore, the scheme only accounts for first-round and second-round effects, and not for the long-term effects on poverty reduction via economic growth. The relation between trade, growth and poverty, and the importance of complementary policies are discussed towards the end of the paper, following the illustrations of first-round and second-round effects.

4.2 First-round effects of trade reform: households face price changes

Model simulations suggest that liberalisation of trade will have a significant impact on relative prices, but 'little is known about the empirical relationship between trade policy changes and changes in relative prices' (Goldberg and Pavcnik, 2004). There is indeed a lack of information about the manner in which border price changes are transmitted to local levels and how this may differ between the poor and non-poor (Winters et al., 2004). Domestic market distortions can play a negative role in the price transmission as was seen in the liberalisation of the cashew nut sector in Tanzania, where traders reaped much of the gains of liberalisation because the remote rural households received only little price information and therefore were not informed of the price increases caused by the liberalisation (McCulloch et al., 2001).

Although the first-round effects have the largest impact on poor rural households, the poverty situation may be adjusted by more indirect, second-round effects, caused by the reaction of the poor household on the direct price effects. The household's ability to adjust to direct price effects will in the end determine the overall welfare effect of the price shock. For example, when a poor household succeeds in switching consumption away from and production towards goods whose price has risen, the household can influence the impact of trade liberalisation on its own welfare position. These production and consumption substitutions will transmit the initial price shock to other markets. On the other hand,

¹ Within the trade and poverty literature, this is sometimes referred to as price transmission, and is not to be confused with the standard concept of price transmission as describing the pass on of price changes from world markets to a domestic price.

McCulloch et al. (2001) argue that 'the direct price effects will rarely be overturned by such second-round effects (...), as most poor households live in (relatively isolated) rural areas, are highly dependent on agriculture and spend a large proportion of their income on food'. But within the rural communities the second-round (multiplier) effects can also be described in terms of spillovers resulting from increased farmers' incomes. The higher farmers' incomes can increase the demand for labor-intensive local activities, such as construction, personal servants and simple manufactures, where the poor are strongly represented. These new employment opportunities might especially benefit the poor net consumer households in their attempt to manage rising food prices, and they will generally take place in the same rural economies, since most rural economies are relatively isolated. An example of how second-round effects work in practice is again provided by the liberalisation of tobacco in Malawi. The increase in prices and farmers' incomes will result in a growing demand for labor by the tobacco farmers. This will profit non-commercial households who provide their labor to the tobacco farmer, since the wages will increase. At the same time the higher wages have a negative effect on the income of poor farm households that hire in labor (OECD, 2006).

Balat and Porto explore the household-level impacts of price changes resulting from trade reform for cotton producers in Zambia. In the opinion of the two authors the critical factor in their case is the share of household income generated by cotton production, which is around 8% on average in Zambia. An approximation of the real income impact of a cotton price change can be obtained by multiplying the income share by the price change (in terms of % age). Therefore they have focused on the evolution of cotton income shares among the poor in the three provinces, where cotton is produced. Balat and Porto consider the impact of a 12% price rise (which is based on several independent studies) and they find that the impact on household incomes is relatively modest, around 1% ($0.12 * 0.08 = 0.0096$). However, they find that the real income impact could be increased by improving (the access to) agricultural extension services and out-grower schemes, which would enhance productivity. According to Balat and Porto's estimations household incomes could rise with 9% when the impact of higher cotton prices and increased productivity is combined. Furthermore they show that the results would be even more spectacular for subsistence farmers that switch to export-oriented cotton production. Their incomes could be boosted by 20% (in case of higher prices) and even by 33% if the productivity impact is included.

WTO reforms involve all sectors, resulting in price changes for several products. In this sense, Ferreira Filho and Horridge (2006) present a more realistic picture than Balat and Porto. In their case study on agricultural trade reform in Brazil, Ferreira Filho and Horridge account for the full range of price impacts at a highly disaggregated level. They use data from 264 thousand adults and 112 thousand households in 27 regions. The authors find that the agricultural sector benefits most from WTO liberalisation. The regional dimension of the study is especially worth noting, since there are large variations in income and poverty across the different regions. Indeed, many model studies agree that Brazil is among the largest gainers of agricultural trade reform. It is widely thought that these welfare gains will accrue to the large farmers, resulting in a further worsening of the income distribution. Ferreira Filho and Horridge, on the contrary, argue that the poorest households benefit from reform. The expansion of Brazilian agricultural production and exports

will generate additional demand for unskilled labour in agriculture that will largely benefit poor households. At present 41% of low-skill workers are employed in the agricultural sector. Thanks to the increased demand for this specific type of labor, the poorest households will benefit from higher wages and poverty will be reduced for a large group of households.

Litchfield et al. (2003) have attempted to measure empirically the effects of trade reform on poverty. While the other two case studies (of Balat and Porto and Ferreira Filho and Horridge) on price transmission were simulations of future trade reforms, Litchfield et al. have analysed the effects of trade liberalisation in the 1990s: of rice in Vietnam, grains in Sichuan, China and maize in Zambia. In Vietnam, liberalisation of the rice sector indeed 'mattered', but the authors also found that the liberalisation was directly responsible for a dramatic poverty reduction. In China it did not become clear that trade reform had a predominant effect on poverty, but the increase in grain prices did have a significant effect in reducing entry into poverty (in particular among net-producing households). In Zambia the effects were less clear; initially the maize reforms were harmful for non-agricultural households (higher prices), and beneficial for rural farmers, but additional input and output market reforms have muted these impacts on rural farmers.

The main question with respect to price transmission and poverty is how much of the price change gets passed through to the poor. In the end, the answer lies in the nature of competition, and the functioning of institutional arrangements. The rise of institutional economics and the sociology of organisation is giving an important impetus to this line of study.¹

4.3 Second-round effects: households adjust to changing market conditions

4.3.1 Factor mobility and market imperfections

The above mentioned increase in wages for low-skilled labor as a result of a growing demand for labor, assumes the existence of a well-functioning labor market. However, as Kuiper and Van Tongeren (2006) show, operational factor markets (for land, labor and capital) might be absent in some cases, which can raise market failures around imperfect competition and information asymmetry. Kuiper and Van Tongeren illustrate this by employing a village-level model of a community in Jiangxi province in China. Crucial in their study is the grouping of households, which are very heterogenic, according to their factor endowments. In this respect an important distinction is made between households with and without access to draft power (animal or tractor). Furthermore it is important to consider whether household members are involved in temporary migration outside the province. From their analysis Kuiper and Van Tongeren conclude that the three existing factor markets (labor, land and capital) are all imperfect. This market failure makes it difficult for households to make simple decisions about production and consumption, since wages, land rents, etc. cannot be taken as given. In their poverty impact assessment, Kuiper and Van

¹ A related contribution on trade issues is Koning et al. (2006). For a new institutional economics perspective on agriculture in the developing countries, see Eaton and Meijerink (2006).

Tongeren consider two scenarios, the Doha scenario and full liberalisation. The real income gains in the Doha scenario are rather modest, about 1.2%, but evenly spread across the different household types. In case of full liberalisation (with greater price rises for rice and other farm products) the aggregate income gains are four times larger. Furthermore the spreading of gains across households is much more uneven: households with access to draft power will gain twice as more as other household types. This reflects the importance of draft power for the intensification of production.

4.3.2 Position of small farmers: role of institutions

The position of poor rural households is also influenced by the fact that agricultural markets are featured by large distortions, both domestically and internationally. The assumption that farmers always have access to international commodity markets underlies the features of the trade-poverty relation as discussed by McCulloch et al. (2001). However it can be questioned whether poor smallholders indeed always have access to international commodity markets. According to Dorward and Kydd (2002) the 'new economy' (characterised by globalisation of trade, financial flows and institutions) can both provide opportunities and threats to poor farmers in developing countries. One of the threats is that poor smallholder households get locked out of markets due to slow progress in participation of their country in the global economy. Another reason is the physical and institutional isolation of poor households in rural areas. Furthermore, the fact that poor households have access to local, national and international markets does not always mean that they can benefit from this access, since a number of institutional deficiencies limit smallholder areas from taking advantage of market opportunities: inadequate access to information, contractual enforcement and finance. Often transaction costs are in excess of the potential benefits of the transaction, which leads to market failure. It is argued that 'policy trends (liberalisation) and autonomous developments in technology and supply chains (globalisation) may have made the achievement of broad-based smallholder development more difficult' (Kydd, 2002).

4.3.3 Factor prices and household decision-making; focus on the labor market

Labour markets are important mechanisms for transmitting developments in the world marketplace to impoverished households (Hertel and Winters, 2006). Bussolo, Lay and Van den Mensbrugge (2006) have modeled the decision to move out of agriculture, based on historical evidence of individuals changing sectors in Brazil. In their analysis they use a 2001-15 baseline in order to better judge the impacts of a trade reform. In the business-as-usual scenario (without trade reform) aggregate poverty falls by 14%. This can mainly be attributed to agricultural growth, which changes factor prices (higher wages). But Bussolo, Lay and Van den Mensbrugge also find that the poorest farm households may improve their income position considerably by switching from low-wage farm labor to higher-wage nonfarm labor. In their analysis of the implications of trade reform, the authors distinguish three different labor force groups: the 'movers', who move from the farm sector to the non-farm sector during the baseline period, the 'agricultural stayers' and the 'nonagricultural stayers'. Of these three groups, the 'movers' clearly benefit most from trade reform: they

experience a 22.4% age point reduction in their poverty headcount (down from 53.4 to 31%). The 'agricultural stayers' experience a 11.7 percentage point reduction, while the reduction for 'nonagricultural stayers' is only 3.8%. Overall poverty reduction as a result of trade reform alone is however quite modest: 3% of the baseline change in the Doha scenario and 9% of the baseline change in case of full liberalisation. These results clearly show that trade reform is only one of the contributors to poverty reduction.

Robilliard and Robinson (2006) analyze an individuals' decision-making process concerning the choice between formal and informal labor. The formal labor sector offers high wages, but limited opportunities for employment, while the informal labor market is more open, but offers flexible wages. In case of a trade reform, employment markets will be altered, which will impact on the households. In their case study on Indonesia, Robilliard and Robinson distinguish three alternative labor market configurations: fixed aggregate employment and flexible wages (changes between sectors possible); fixed sector-specific labor (no change in employment by sector); and fixed real wages and variable aggregate employment (changes in unemployment are permitted). The poverty impacts are analysed for the full-liberalisation scenario, and the largest reduction in poverty comes from the fixed aggregate employment scenario: 1.4 million people are lifted out of poverty. In the second scenario the economic adjustment is hampered by the fixation of employment by sector, which results in a somewhat lower poverty reduction of 900,000 people. In the third scenario with variable aggregate employment trade reform will increase the aggregate number of jobs. However, the impact on poverty depends on who gets the jobs. Therefore Robilliard and Robinson have estimated the likelihood that each type of unemployed individual will get one of the new jobs. This introduces considerable uncertainty in their estimates, such that the actual poverty impact may vary considerably from the predicted impact.

4.3.4 Fiscal replacement of lost tariff revenues

The last link from figure 1 is about the role that a government of a developing country can have in translating trade liberalisation effects into household poverty effects. In particular this link deals with the question how governments of liberalising countries could replace lost import tariff revenues by domestic taxes. In their case study on Cameroon, Emini, Cockburn and Decaluwé (2006) show that, in case of fiscal replacement, the poverty impacts of trade liberalisation vary with the choice of the replacement tax. In this sense the choice of the replacement tax is also an important determinant of the size of the poverty impact, next to the choice between partial and full liberalisation. The authors examine the poverty impacts of the trade liberalisation, whereby in particular the different options for replacement of lost tariff revenues are considered. In the Doha scenario, with value added tax (VAT) as a fiscal replacement, poverty falls slightly, due to the fact that tariff cuts are only marginal and the VAT rate on agriculture is 0%. On the other hand, in the case of full liberalisation, tax replacement will lead to a poverty increase. Emini, Cockburn and Decaluwé show that the use of a non-distorting production tax will be least harmful for the poor (net increase of 87 thousand people). An increase in consumption taxes will worsen the income situation of 500 thousand people, while the application of the VAT will increase poverty with 300 thousand people.

4.4 Long-term effects: poverty reduction through economic growth

The literature suggests a strong distinction between the analysis of short-term and long-term poverty effects of trade liberalisation. In the short run there will be direct effects on livelihoods as a result of changes in input, output and labour markets and taxes. These effects will be directly transmitted via changes in e.g. producer prices and household purchasing power. Next to short-term effects there are also indirect poverty impacts via economic growth and structural changes in the economy (long-term effects). Opponents of trade liberalisation mostly refer to the short-term effects of trade liberalisation, since they involve adjustment costs, such as job losses in formerly protected sectors. A significant question in this respect is whether the short-run (adjustment) costs of trade liberalisation fall disproportionately on the poor (World Bank, 2005). And in case the poor will lose in the short-term, will they eventually gain in the long-term?

The debate about the long-term poverty effects of trade liberalisation is often dominated by the question whether opening up to trade leads to higher growth. According to Dollar and Kraay (2004) there is a certain consensus about the belief that openness to international trade accelerates development. The World Bank (2005) further argues that 'openness to trade has been a central element of successful growth strategies'. Other economists are more skeptical about the trade-growth relationship. From their review of empirical literature on the trade-poverty relationship Rodríguez and Rodrik (2000) conclude that there is 'little evidence that open trade policies (...) are significantly associated with economic growth'. Recognising the lack of consensus in the debate the World Bank has drawn two careful conclusions in an attempt to summarise the current stance of the debate: 1. trade protection is not good for economic growth; 2. trade openness by itself is not sufficient for growth (World Bank, 2005). Because of the lack of consensus and because the trade-growth debate exceeds the boundaries of the trade-poverty link, we will not enter into details on the trade-growth debate.

4.5 Summary and discussion

There are strong links between agricultural trade and poverty. For poor households in developing countries, agriculture is the main source of income or food security, and food products are the main expenditure. Food markets in the developing countries have become increasingly open to trade in the last few decades, which exposed farmers and consumers to developments in international markets and global policy change. There is, therefore, a need for a proper understanding of the consequences of agricultural trade liberalisation on the poor and the vulnerable. Too much of a focus on agriculture will misguide poverty analyses in the rural area because earnings from farming commonly are one of several sources of income. As the earnings in off-farm activities are potentially affected by policies affecting the markets for manufactures and services, the labour market is a natural starting point for the poverty analysis of a multi-sector trade reform.

Five years ago the applied research on trade and poverty was still in its infancy but of the Doha round has provided an impetus for a rapid expansion of the literature. At present, the first preliminary quantitative estimates of the poverty effects from trade reform are

available from the World Bank. The results indicate that a global economy-wide trade liberalisation may push tens of millions of people out of poverty but the impact of a possible Doha agreement is small or, in Sub-Sahara Africa, even counterproductive. It is neither wise nor intended to take these numerical estimates too literally. This chapter has presented ample evidence which renders these numerical estimates as premature attempts, useful as yardsticks only.

Research agenda

Some refer to trade and poverty links as a puzzle, the pieces of which relate to income and expenditure in the household on the one hand, and trade reform on the other hand. In a simple framework, after world price or policy changes enter the system, the interplay of border prices with domestic factor and output markets determines impact at the bottom scale, i.e. the household level.

The body of literature that links households to domestic markets and trade reform has received a tremendous boost from institutions such as the World Bank, DFID and the OECD. Some good case studies are available; several apply global economic modelling with some module for poverty assessment; others focus on the interplay between national markets and household decisions, and examine the spatial impact or institutional settings of reform.

Progressively, analysts are turning to the quantification of the trade and poverty links. This chapter illustrated some of the methods and complications involved in 'examining the plausibility of [trade and poverty] links given our knowledge of how the economy works' (citation Alan Winters). The discussion focused on how price changes at domestic markets influence the incomes of households; factor mobility and market failure; the production and consumption decision in the households following changing factor prices; the issue of fiscal replacement of lost tariff revenues and the impact on households.

Thus, the analytical gaps on the trade-poverty links are increasingly well-defined. Hertel and Reimer (2005), expressing common opinion within the research community, list the main directions for further research as: missing markets and factor mobility; characterizing consumer behavior; transaction costs and price transmission; data reconciliation; and tax revenue and transfer payments.

Policies

The generalisation across links between agricultural trade liberalisation and poverty is difficult because the impact of trade liberalisation on poverty depends on the environment in which it is carried out (see for instance Winters et al., 2004; Rodríguez and Rodrik, 2000). In most cases liberalisation works out well for the rural poor, but there are still many cases where trade reform can have adverse effects on the poor. In these cases the government of the particular country may come up with complementary and compensatory policies to mitigate the negative impact of trade reform on the poor. Furthermore the timing of the reform is important: for example, developing countries would do better when liberalising their imports after developed countries have cut back their agricultural subsidies (McCulloch et al., 2001: 195). But the ultimate outcome of trade liberalisation and its impact on poverty alleviation depends on many factors (next to timing): its starting point; the

trade reform measures undertaken; the characteristics of 'the poor'; and how the poor sustain themselves (Winters et al., 2004).

Although trade liberalisation is not always among the most important determinants of poverty reduction, it is at the same time one of the most cost effective anti-poverty policies available to governments. Specific pro-poor policies might be more targeted to the poor than trade liberalisation, but they are often administratively complex and expensive. If trade liberalisation is implemented with care, it can be a good means to tackle poverty (Winters et al., 2004). The governments of developing countries thereby need to ensure that increased agricultural incomes indeed filter through the poor. This can be done by policies such as extension services, land redistribution and improved access to the markets for input and output.

Poverty has a lot to do with a lack of income. But there has been great evolution in the thinking about causes and implications of poverty (Kanbur and Squire, 2001). The conventional poverty concept is usefully expanded to cover health, education, political rights, etc., in order to better reflect the interaction of aspects that underlie poverty. Participatory poverty research has been instrumental in increasing the attention for risk, vulnerability, powerlessness, and lack of voice.

All aspects of poverty are strongly correlated, and expanding the definition of poverty does not alter the measurements of poverty (at least not at the aggregate level). Hence, expenditure-based poverty lines are still useful indicators of poverty. Expenditures are preferred over income as they are easier to measure and more stable over time. Household food expenditure is considered the best indicator of permanent income. In the application of poverty lines in poverty analysis several deficiencies should be kept in mind. (1) Differentials in cost of living (e.g. between rural and urban areas) require the use of location-specific poverty lines. (2) The monitoring of expenditure does not reveal the specific context of chronic and transitory poverty. (3) Expenditure-based measurement does only consider goods and services delivered through the market and excludes, for instance, the market value of home-grown or bartered consumption. Empirical applications of expenditure-based poverty lines have undercut the relation between growth and inequality suggested by Kuznetz. Inequality does not appear to decline with income growth. In fact, the empirics suggest that quantitative measures of inequality at the country or regional level are quite resilient through time, and hardly ever show rapid declines.

As the concept of poverty widened, the need became clear to differentiate policy responses toward the poor. It is now better understood that the poor not only lack income or employment, but more so the assets to benefit from job opportunities, and to carry these over the generation: the health and education to be productive in the job, and raise healthy and literate children. Market fluctuations, climatic and agricultural seasons, and crises bring poor households at risk. Their vulnerability has two sides: the exposure to losses of assets or income, and the lack of means to address the losses. One development concept in which assets and risk take centre stage is the 'sustainable livelihoods approach' diffused by DFID and many others. a)

To alleviate chronic poverty demands a support of building capital in the form of better health and education, and so to increase the return to labour. To reduce risk and vulnerability linked to transient poverty, more appropriate policies involve insurance schemes and social safety nets. Yet, just as health and education, risk-reducing institutions are critical building blocks to help the poor increase their incomes.

Box 4.1 Poverty concepts

a) For an introduction, visit <http://www.livelihoods.org/SLdefn.html>.

5. Conclusion

This study reviewed the effects of agricultural trade liberalisation on developing countries, first from the perspective of agricultural markets, then economy-wide, and finally with respect to household level impact.

When developing countries assess their interests in WTO trade reform, for most economic activities the best guidance is to examine the scope for the liberalisation of own border policies. Agriculture is different in that respect; other countries' policies have effects on the liberalising country that may warrant caution for a coordinated liberalisation effort involving several countries. More specifically, agricultural policy reform by the high income countries will influence the expected effects from global agricultural trade liberalisation in the developing countries. One of the mechanisms at work goes via the world markets for temperate zone agricultural products: prices for selected livestock products and cereals will rise, particularly as a result of reduced production in the OECD countries following subsidy cuts, and due to the expansion of demand after the domestic (policy) prices for these food products have come down under the reform. Another driver is OECD countries' market opening in agriculture, causing changes in global patterns of specialisation and trade.

Nine out of ten developing countries are net importers of OECD farm products, with a strong interest in low-priced food imports. One could reason that the developing countries have an interest to maintain the current status quo in farm trade policies, and little interest in a Doha agreement that curtails options to protect domestic agriculture. The literature on agricultural trade and development suggests quite the opposite. The (incomplete) evidence on the direct effects on agricultural markets supports the conclusion that the burden imposed by OECD farm policies on the developing countries as a group is limited yet unequally spread within the group, which explains why only selected groups (e.g. cotton producers) are vocal in the negotiations.

Looking at the matter from a long run perspective, depressed world prices discourage entry of temperate crop producers, and reduce the exit incentives of developed country producers, possibly even to the extent that trade positions would differ if it were not for the present policies. Hence, there are strong interests to reduce policy distortions in the OECD countries. Moreover, to speed up capacity development and technological change, developing countries can expect much more from opening up for foreign trade and investment than from the reform of OECD farm and farm trade policies. One must conclude, however, that the direct effects from trade reform tend to dominate the debate.

In summary, due to terms of trade losses and preference erosion, for the wide majority of developing countries the interests in reform of OECD farm policies appear bleak unless the positive spill-over into technological or institutional change is considered. One must conclude, however, that the direct effects from trade reform tend to dominate the debate. In that perspective, key points for developing countries are that (a) global agricultural reform contributes to reduce substantial distortions within developing country agriculture;

and (b) global agricultural reform is embedded in an all-sector liberalisation effort, in order to provide opportunities to make up the losses from agricultural reform in non-agricultural activities and markets.

There is a large body of recent quantitative assessments on the economy-wide gains from multilateral agricultural trade reforms using global economic models. A selection of recent influential studies applying economy-wide models of the global economy estimate a range of global welfare gains between USD 56 billion to USD 182 billion under full global liberalisation. In terms of fostering global economic expansion, agricultural trade reform is not your horse to bet on. Under a possible Doha agreement on agriculture, the prospected welfare effects on the developing countries lie somewhere between a loss of about USD 2 billion and a gain of about USD 0.5 billion. The effects of agricultural trade reform are generally too small to have an overriding on trade or development. Developing countries share considerably less in the gains from agricultural reform than under reform of non-agricultural market access or trade in services. A key point for developing countries is that agricultural reform is embedded in an all-sector liberalisation effort, in order to provide opportunities to make up the losses from agricultural reform in non-agricultural activities and markets.

To the observer, it is perhaps worrying how similar are the expectations of trade analysts on possible economic effects of a trade reform under the Doha round. The dominant input into the policy debate on trade liberalisation is produced by global economic analyses, all of which use similar methodology and (GTAP) data. Critics describe this as a setting that pushes those who are not a priori in favour of trade liberalisation, and in particular of agricultural trade liberalisation, on the defence. In part, this is because of the foundation of the global economic models in neoclassical economics, which has a free-trade bias. Competing economic frameworks are available, including analyses based on evolutionary economics and studies that place trade reform in historical or institutional perspective. Nongovernmental organisation OXFAM recently contributed to the debate by providing a stage for Lance Taylor (2005), who challenged the macroeconomic validity of global economic analyses from the perspective of structuralist economics.

Another explanation is that the methods applied are geared towards the analysis of net, aggregate effects. Trade reform creates gainers and losers, both within and across countries. Applying the principles of utilitarian welfare economics, the typical trade analyses ignores that the losses from trade reform may weigh heavier than the gains, certainly if those losses are incurred by the poorest countries or most vulnerable households.

There is, therefore, a need for a proper understanding of the consequences of agricultural trade liberalisation on the poor and the vulnerable. Five years ago the applied research on trade and poverty was still in its infancy but of the Doha round has provided an impetus for a rapid expansion of the literature. Some refer to trade and poverty links as a puzzle, the pieces of which relate to income and expenditure in the household on the one hand, and trade reform on the other hand. The analytical gaps on the trade-poverty links are increasingly well-defined.

At present, the first preliminary quantitative estimates of the poverty effects from trade reform are available from the World Bank. The results indicate that a global economy-wide trade liberalisation may push tens of millions of people out of poverty but the

impact of a possible Doha agreement on agriculture is small or, in Sub-Saharan Africa, even counterproductive. It is best to take these numerical estimates as premature estimates.

A lot remains unclear on the impact of trade reform, providing scope for much additional work and improved understanding: the interplay between domestic markets (agriculture and non-agriculture) and the world market is largely determined by the intricacies of domestic markets and the functioning of institutions; the (short term) contribution of trade reform on poverty alleviation may be benign or not, depending on the type of adjustment and the effects on income-earning assets in the most vulnerable households in developing countries; the effectiveness of proper sequencing reform and of side policies (complementary to trade reform) in facilitating structural change in the economy of countries or regions, or income-earning assets in the households - much remains unexplored; the long term effects of trade reform on the potential for economic growth and sustainable alleviation of poverty are different for each specific case; the economic effects of changes in agricultural policies are unclear, specifically in relation to policies that fully or partially decouple farm support from production decisions. Several of these methodological improvements are considered of critical importance to arrive at global economic analyses that are more relevant for the policy agenda for sustainable development.

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