



Centre for International  
Economic Studies

Discussion Paper  
No. 0234

# **Agricultural Trade Reform and Poverty Reduction in Developing Countries**

**Kym Anderson**

**November 2002**

**University of Adelaide  
Adelaide 5005 Australia**

## **CENTRE FOR INTERNATIONAL ECONOMIC STUDIES**

The Centre was established in 1989 by the Economics Department of the Adelaide University to strengthen teaching and research in the field of international economics and closely related disciplines. Its specific objectives are:

- to promote individual and group research by scholars within and outside the Adelaide University
- to strengthen undergraduate and post-graduate education in this field
- to provide shorter training programs in Australia and elsewhere
- to conduct seminars, workshops and conferences for academics and for the wider community
- to publish and promote research results
- to provide specialised consulting services
- to improve public understanding of international economic issues, especially among policy makers and shapers

Both theoretical and empirical, policy-oriented studies are emphasised, with a particular focus on developments within, or of relevance to, the Asia-Pacific region. The Centre's Director is Professor Kym Anderson ([kym.anderson@adelaide.edu.au](mailto:kym.anderson@adelaide.edu.au)) and Deputy Director is Dr Randy Stringer ([randy.stringer@adelaide.edu.au](mailto:randy.stringer@adelaide.edu.au))

Further details and a list of publications are available from:

Executive Assistant  
CIES  
School of Economics  
Adelaide University  
SA 5005 AUSTRALIA  
Telephone: (+61 8) 8303 5672  
Facsimile: (+61 8) 8223 1460  
Email: [cies@adelaide.edu.au](mailto:cies@adelaide.edu.au)

Most publications can be downloaded from our Home page:  
<http://www.adelaide.edu.au/cies/>

ISSN 1444-4534 series, electronic publication

**CIES DISCUSSION PAPER 0234**

**Agricultural trade reform and poverty reduction  
in developing countries**

**Kym Anderson**

CEPR, and School of Economics and  
Centre for International Economic Studies  
University of Adelaide  
Adelaide SA 5005 Australia

Phone (61 8) 8303 4712  
Fax (61 8) 8223 1460  
kym.anderson@adelaide.edu.au

**November 2002**

Revision of a paper prepared for the Fourth Asia Development Forum on Trade and Poverty Reduction, Seoul, 4-5 November 2002. Thanks are due to the Asian Development Bank, the World Bank and the University of Adelaide for financial support.

# Agricultural trade and poverty reduction in developing countries

Kym Anderson

Throughout most of the 19<sup>th</sup> and 20<sup>th</sup> centuries, the number of people in the world in absolute poverty (defined as living on less than the equivalent of one US dollar per day in 1985 PPP terms) had been increasing almost continually (Bouguignon and Morrisson 2002). Since the late 1970s, however, the number has declined by more than 200 million, or from 15 to 7 per cent of the global population; and the number on less than \$2 per day has declined by 450 million, or from 40 to 19 per cent of the world's people, according to new estimates by Sala-i-Martin (2002).

Remarkable though that recent achievement has been in such a short period, Sala-i-Martin's data suggest there are still 350 million on less than \$1 and almost one billion on less than \$2 per day – half of whom are in Asia. World Bank estimates (e.g., Chen and Ravallion 2001) suggest those numbers are several times larger, with possibly as many as 1.2 billion on less than \$1 per day.

The evidence presented by Sala-i-Martin (2002) suggests economic growth differences have been largely responsible for the differences in poverty alleviation across regions, a finding supported by numerous other studies (e.g., Dollar and Kraay 2002). Initiatives that boost economic growth are therefore likely to be helpful in the fight against poverty.

Trade liberalization is one such initiative that tends to boost economic growth.<sup>1</sup> But it also alters relative prices, so its net effect on poverty reduction depends also on the signs of those relative product and factor price changes. If the price changes are pro-poor, then they will reinforce any positive growth effects of trade reform on the poor. This paper explores the poverty implications of three current

---

<sup>1</sup> The link between openness and economic growth, while not completely unambiguous and universal, is strong, and there is no evidence that openness is harmful to growth (see the discussion in McCulloch, Winters and Cirera 2001, Ch. 2). Trade's impact on growth can be much reduced in the absence of liberal domestic markets, macro stability, and appropriate institutions and infrastructure, however, since those are all necessary to enable producers to respond to changes in international market signals (Hoekman et al. 2002). For a comprehensive survey of the links between trade, growth and poverty, see Berg and Krueger (2002). A survey of the empirical evidence is available in Winters, McCulloch and McKay (2002).

trade reform agendas with a particular focus on the role of reducing agricultural import barriers.

At the Fourth Ministerial Meeting of the World Trade Organization (WTO) in Doha in November 2001, members agreed to launch the next comprehensive round of multilateral trade negotiations (MTNs). Even though there is a substantial focus on development concerns in the Doha Ministerial Declaration (WTO 2001b), numerous developing countries remain sceptical that they will receive sufficient gains from that MTN to warrant the inevitable costs of negotiations and adjustments. They and some in the donor community also still need to be convinced that such trade reform will alleviate rather than add to poverty and food insecurity in developing countries. The net food-importing countries are especially worried that they will be made worse off by agricultural trade reform.

In offering an economic assessment first of the opportunities and challenges provided by the Doha MTN round for developing countries seeking to trade their way out of poverty, the present paper begins by reporting some modelling results. Those results suggest that agricultural trade policies remain the most costly of all goods market distortions in world trade. What becomes clear is that if developing countries want to benefit from the Doha round, they need to free up their own markets so their producers are better able to take advantage of new market-opening opportunities abroad. The paper addresses such questions as whether food-importing countries would suffer from higher food prices in international markets, and the impact on food security and poverty alleviation.

Attention then turns to the non-binding agreement among APEC countries to free up their trade by 2020. Modelling results underline the point that gains from that regional initiative will be minor unless agriculture is included.

And the third reform agenda examined relates to China's accession to WTO. That is altering relative prices in China to a much larger extent than the Doha Round is likely to do, and the conventional wisdom is that it will do so in ways that will exacerbate poverty in that country. The results presented offer a somewhat more optimistic view.

The paper concludes with lessons of relevance for the domestic and trade policies of Asia's developing countries.

### **Where are the biggest potential gains from the next WTO round?**

Tariffs facing poor-country exports to other markets are high. A recent book pointed out that Mongolians and Norwegians both paid the US about \$23 million in tariffs in 2001. But Mongolia exported \$143 million while Norway exported \$5.2 billion worth of products, or 40 times as much. In effect, Mongolians paid 16 cents in tariffs to sell a dollar's worth of sweaters, while the Norwegians paid half a cent for every dollar's worth of gourmet smoke salmon, jet engine parts and North Sea crude they exported. Clearly, trade barriers of one country can have very different impacts on other countries' economies.

At the end of the Uruguay Round negotiations, the tariff equivalent of import market access barriers to goods trade were low for minerals and energy raw materials and for most manufactures entering developed country markets (the exceptions being textiles and clothing); but they were high for numerous manufactures entering developing country markets and even higher for agricultural goods entering both rich and poor countries (Table 1). Since developing countries' interests in market access opportunities abroad are primarily in either farm products and/or light manufactures such as textiles and clothing – goods that are the most protected in world trade (see also WTO 2001a) – they have a great deal to gain potentially from the Doha Round.

That fact is reflected in a recent set of empirical estimates using a model of the global economy known as GTAP (Global Trade Analysis Project), which is an applied general equilibrium model based in Purdue University (Hertel 1997).<sup>2</sup> According to estimates in Anderson (2003), of all the economic gains to be had in 2005 from removing the barriers to trade in goods that will still be in place after all Uruguay Round commitments are implemented, almost half (48 per cent) would come from agricultural and processed food policy reform in OECD countries (Table 2) – even though such products in those countries contribute only 4 per cent of global GDP and less than one-tenth of world trade. Another one-sixth of the welfare gains would come from reform of farm and food policies of developing countries.

Textiles and clothing reforms would be the next biggest contributor, although they appear pale by comparison with agricultural reform: their potential global welfare contribution is only one-ninth that of agriculture's (7 per cent compared with 65 per cent). This big difference reflects two facts: one is that projected distortions to

---

<sup>2</sup> The GTAP model is a standard, multi-region model that is currently in use by several hundred researchers in scores of countries on five continents. The Version 4 data base builds on contributions from many of these individuals, as well as the national and international agencies in the GTAP Consortium.

prices for agriculture are more than twice those for textiles and clothing in 2005; the other is that textiles and clothing contribute only 1.5 per cent to the value of world production and 5 per cent to the value of world trade, half or less the shares for farm products (Anderson 2002).

However, two assumptions are crucial in generating the results reported in Table 2. One is that China and Taiwan, having joined the WTO at the end of 2001/start of 2002, does in fact enjoy the same accelerated access to OECD markets under the Uruguay Round Agreement on Textiles and Clothing (ATC) as other developing countries that were already WTO members. The other crucial assumption is that OECD countries fully implement the spirit of the ATC by the end of 2004, that is, they remove remaining import quotas and do not replace them with similarly protective instruments such as safeguard measures. Dropping either of those assumptions reduces very substantially the estimated gains from Uruguay Round implementation (Anderson et al. 1997b), and therefore would raise the potential gains from textile and clothing reform in the next and subsequent WTO rounds than is reflected in Table 2.

The distribution of the gains across regions that would result from full trade liberalization is clear from the upper half of Table 2. As always, most of the gains accrue to the liberalizing region. For example, all but one-tenth (12/122) of the gains from high-income countries removing distortions to their trade in farm and food products accrues to those countries. Even so, that farm trade reform contributes more than one-quarter of the total welfare gains to developing countries from developed countries liberalizing their merchandise trade (12/43). As for developing countries liberalizing their own farm and food policies, three-quarters of the benefits therefrom stay with the developing countries themselves (31/43), and those policies contribute almost half of the gains from those countries' overall merchandise trade reform (31/65).

WTO members were right, therefore, to insist that agricultural reform must continue into the new century without a pause. In particular, developing countries as a group have a major stake in the process of farm policy reform continuing: according to the model results in Table 2, farm and food policies globally contribute 40 per cent (43/108) of the cost to developing economies of global goods trade distortions. Textile and clothing policies also harm them greatly, but barely one-third as much as

farm policies.<sup>3</sup> The Table shows that 60% of the contribution to developing countries from trade liberalization – and 72% of that from farm trade liberalization -- would come from reforms by developing countries themselves.<sup>4</sup>

The above GTAP modeling study found that full liberalization of OECD farm policies would boost the volume of global agricultural trade by more than 50 per cent, but would cause real international food prices to rise by only 5 per cent on average. For the subset of low-income countries that would remain net food-importing economies after such a reform and thereby suffer a deterioration in its terms of trade, the extent of the rise in their food import prices would be small.

The results for developing countries in Table 2 are disaggregated in Table 3 to show the effects on subgroups of Asian and other countries. In dollar terms the gains from global liberalization would be equally as great for South Asia as for Southeast Asia, while less than half as large for the much smaller economic region of Sub-Saharan Africa. All regions shown are net gainers: even though some of them suffer a terms of trade deterioration, that cost is more than offset by improved efficiency of domestic resource use following reform. Just over half (52%) of the global gains accrue to Asia.

If these were not enough reasons for a developing country government to become an active participant in the Doha Round, including embracing trade reform at home, there are at least three other reasons for doing so. One is that the more each country is prepared to provide trading partners with greater access to its own market, the more those partners are willing to reciprocate by providing greater access to their markets. That benefits exporters in all countries, offsetting the loss of domestic political support from import-competing producers. The second reason is that once a country binds its reform commitments, as required under WTO, its government is better able to resist the temptation to give in to political pressure to reverse that reform. And the third reason has to do with the spread of globalization, which is raising the net political benefits of opening up markets versus remaining protectionist and interventionist. The dramatic falls in the costs of doing business across national boundaries mean not only that the rewards from opening one's own economy to foreign trade and investment flows have risen, but also that the costs of *not* adopting

---

<sup>3</sup> It should be recognised that these results ignore the effect of tariff preference erosion. In so far as a developing country receives such preferences at present in OECD markets, the above results slightly overstate the potential gains from their reforms. This point is taken up below.

<sup>4</sup> Martin (2001) points out that since the mid-1980s, the share of developing countries' agricultural exports that are going to other developing countries has risen from less than 30 per cent to more than 40 per cent.

and maintaining an open, stable and transparent set of economic policies also are rising. If, as a result of these globalization forces, the governments of developing economies choose to embrace more reform at home, it makes sense to capitalize on that decision by using the next WTO Round to demand greater access to trading partners' markets in return.

#### *Qualifications to the global modeling results*

There are three other important source of gains from trade reform that are not captured in the above results, namely, gains from reform to trade in services, gains from increasing competition and economies of scale, and dynamic gains.

The nature of service sector policies makes estimating their effects much more difficult than is the case for goods barriers to trade. Nonetheless, preliminary empirical attempts suggest restrictions on services trade and investment flows are very substantial, particularly by developing countries (Findlay and Warren 2000). Moreover, the GATS negotiations during the Uruguay Round resulted in almost no commitments to lowering those impediments (Hoekman 1996). During that Round many developing countries considered the negotiations that led to the General Agreement on Trade in Services (GATS) as something they had to put up with in order to get agriculture and textiles 'concessions'. Yet the gains to developing countries from opening up their services markets, as for developed countries, would be enormous. Those gains would come not just directly to consumers but also to producers who purchase services as intermediate inputs into their goods production. Farmers in particular would benefit from services reform because they depend heavily on such things as transport services to get their produce to domestic and overseas markets (Anderson and Hoekman 2000).

While measuring distortions to services trade and mark-ups by imperfectly competitive firms is fraught with difficulty, initial attempts are beginning to bear fruit. A new study by Francois (2001) includes one set of estimates of the tariff equivalent of those distortions in a version of the GTAP model that also incorporates imperfect competition and scale economies. Specifically, that study assumes monopolistic competition exists in the non-primary sectors involving economies of scale that are internal to each firm. These modifications amplify the estimated gains from trade considerably. For example, that study finds that if applied tariff rates for both goods and services were to be cut in half, the global gains would be US\$385 billion, of which 51 per cent would be due to services reform. The 49 per cent due to halving

tariffs on goods trade (\$192 billion) in the Francois study compares with the above estimate (where no imperfect competition is assumed) of around \$250 billion from totally removing all tariffs on merchandise trade. The key point to draw from this comparison is that the gains from trade reported above should be interpreted as lower-bound estimates for at least two reasons: because they apply only to goods trade, leaving aside the important distortions prevalent in services markets; and because they are based on the assumption that there are no economies of scale and that perfect competition prevails in all sectors.

None of the studies reported above draw on a truly dynamic economic model. They measure well the effects of producers reallocating their resources and consumers adjusting their purchases when relative product prices change with trade reform, but they do not measure the impact of such reform on investment behaviour. Yet we know from experience that when markets are freed up, investors divert their funds towards expanding the now-more-profitable activities and away from the now-less-profitable ones. They are also willing to invest more in aggregate, because of the reduced uncertainty associated with binding the reforms in WTO schedules. That boost to investment applies even more following the reductions in barriers to foreign investment and hence international technology transfers of the past two decades. Thus economic growth is boosted by that diversion and expansion of investment funds, over and above the boost in output from reallocating existing resource endowments.

This additional effect is omitted from most empirical modelling efforts for two reasons: partly because it takes much longer for analysts to build and to run dynamic models than comparative static ones, and partly because the extent to which investors respond to changing incentives is less well understood and hence cannot be included with as much certainty as the other behavioural characteristics that are common to both comparative static and dynamic models. Keeping that in mind, it is nonetheless instructive to note the results of a recent study that examined the range of outcomes generated as the responsiveness of productivity to openness is varied.

The World Bank (2001, Ch. 6) conducted a study very similar to the one reported above, and obtained very similar results when its version of the GTAP model was in comparative static mode (a global welfare gain from complete liberalization of merchandise trade of \$312 billion per year by 2015, compared with the present study's estimate of \$254 billion as early as 2005 when the world economy would be somewhat smaller). When their same model was switched into dynamic mode, however, that global gain increased two- to three-fold over reasonable ranges of

productivity responsiveness parameters. This adds further weight to the claim that the earlier welfare results should be considered as very much lower-bound estimates of the gains from trade liberalization.

In short, developing countries have much to gain economically from taking part in the next round of WTO negotiations to liberalize trade, and more so the more they are willing to embrace reform at home so as to enable their firms to take greatest advantage of the opportunities provided by the opening up of markets abroad. And this applies especially to agricultural trade reform.

### **Wouldn't food-importing countries lose from higher international food prices?**

Developing countries in Asia, as elsewhere, are quite heterogeneous in their trade specialization patterns (Wilson 2002a). Among the net food-importing developing countries, some fear agricultural protection cuts by OECD countries will lead to higher international food prices for their imports. Yet even those developing countries need not lose out from farm support cuts abroad. If, for example, they are close to self-sufficient in food without price supports (as many net food importing developing countries are), and reform abroad raises the international price of food, they may switch to become sufficiently export-oriented that their net national economic welfare rises. A second possibility is that the developing country's own policies are sufficiently biased against food production that the country is a net importer, despite having a comparative advantage in food. In that case, it has been shown that the international price rise can improve national economic welfare, even if the price change is not sufficient to turn that distorted economy into a net food exporter (Anderson and Tyers 1993). That comes about because the higher price of food attracts mobile resources away from more-distorted sectors, thereby improving the efficiency of national resource allocation. Because of these two possibilities, the number of poor countries for whom a rise in international food prices might cause some hardship is much smaller than the number that are currently not net exporters of agricultural products.

What about those developing countries whose comparative advantage is gradually moving from primary products to (initially unskilled) labour-intensive manufactures, as in much of Asia? While that industrialization lowers their direct interest in agricultural trade reform abroad, it heightens their keenness to see barriers to exports of textiles and clothing lowered. That interest of theirs in textile trade

expansion should be shared by agricultural-exporting developing countries, for if Asia could export more manufactures, it would tend to become a larger net importer of agricultural products. Conversely, lowered industrial-country barriers to agricultural trade would reduce the need for the more land-abundant developing countries to move into manufactures in competition with the newly industrializing ones. Scope clearly exists for the two groups to band together and negotiate as a single voice calling for barriers to both farm and textile trade to be lowered, so that each group can better exploit its comparative advantage to the direct benefit of the vast majority of poor people in both. If that means lowering protected domestic food prices, some farm labourers will find jobs in the expanding light industrial sector where wages will have risen. Even those staying in agriculture need not lose, if savings from cuts in price supports were used to reduce underinvestment in such areas as agricultural R&D and rural roads, education and health.

### **Wouldn't poverty and food insecurity increase in low-income countries because of higher international food prices?**

The impact of trade liberalization on income distribution and thereby on poverty is not always clear: even though the effects of trade policies on capital owners and workers have been studied by trade theorists for centuries, applying that theory to the real world turns out to be a complex empirical task (Winters 2000; McCulloch, Winters and Cirera 2001; Hoekman et al. 2002). This is because the economy-wide effects depend (a) on the shares of households' income from different productive factors such as labour and land, whose prices will have changed (depending on the size of the changes in relative producer prices, factor substitutability, factor intensities, and factor mobility between sectors), (b) on their expenditure shares on different products (whose consumer prices also will have changed and not necessarily to the same extent as producer prices not least because of marketing margins), and on any changes in net transfers to them (e.g. increased handouts, decreased taxation, more remittances from urban relatives). Those complexities make it difficult to generalize a priori, or even in the face of empirical modelling studies when they report effects of reform just on production, trade, prices and aggregate economic welfare. Even so, some observations are nonetheless worth making about the effects on poverty and food security of reducing agricultural protectionism globally.

Most low-income countries have not propped up the producer price of food. In so far as an international food price rise is transmitted domestically, the vast majority of the poor would benefit directly. This is because they are in farm households and are net sellers of food. Even poor landless farm labourers who are net buyers of food would benefit indirectly from agricultural trade liberalization via a rise in the demand for their unskilled labour, assuming that raises their wage sufficient to more than offset the rise in food prices. Since the more affluent people in cities would find it relatively easy to pay a little extra for food, the only other major vulnerable group is the under-employed urban poor. But even they may not be worse off because the trade reform would be likely to generate a more-than-offsetting increase in the demand for their (often informal sector) services.

What about the impact of reform on food price variability and other aspects of food security, especially as it affects the poorest households? Contrary to popular belief, trade liberalization is much more likely to reduce than raise food insecurity for the vast majority of the world's poor. Food security means always having access to the minimum supply of basic food necessary for survival. The key to that, in addition to peace and greater efficiency in the functioning of staple food markets, is strengthened purchasing power of the poor. That is, enhancing food security is mainly about alleviating poverty. The rate of food self-sufficiency is at most only a supplementary indicator, and only while there remains a perception that food insecurity rises when the level of food self-sufficiency in basic foods falls much below 100 per cent.

Eliminating all agricultural policy distortions in developed countries would raise international prices for agricultural products on average, and reduce their variance by 'thickening' the market, which would stimulate production in non-protected countries. According to one recent study (Diao, Somwaru and Roe 2001), that would boost the value of agricultural exports of developing countries by 24 per cent while dampening their agricultural imports by just 2 per cent. That suggests food self-sufficiency in many low-income countries would rise. As well, since a high proportion of the poorest households in developing countries are producers and net sellers of food, they would benefit from such reform. In both respects, therefore, food security for the vast majority of households in low-income countries should be enhanced on average. Those same households would be helped even further if agricultural price-depressing policies were in place domestically and these are

removed. The latter reform also boosts self-sufficiency in agricultural products and thereby boosts even further perceived food security in those economies.

The Diao, Somwaru and Roe (2001) study estimates that eliminating developing countries' own agricultural price distortions would boost their farm export value by a further 6 per cent. True, the households that are net buyers of food in such economies will face higher food prices; but whether they become less food secure depends also on what happens to their earnings (and/or transfers). If they are landless rural poor, their earning prospects will have risen along with the growth in demand for farm labour. As for urban households, the vast majority of them are more affluent than those in rural households and so can well afford to pay higher market prices for food. This suggests only a small proportion of households in low-income economies would be net food buyers at risk of becoming more food-insecure as a result of rising domestic food prices following trade liberalization.

What about in low-income economies where agricultural trade liberalization means lower domestic prices for agricultural products because such countries that have kept domestic food prices above international levels via import restrictions? It is true that removing those distortions will reduce farm incomes in those countries (albeit by more for larger than smaller farms). Certainly urban households will benefit from lower food prices. However, food self-sufficiency will fall -- and it is the fall in both farm earnings and food self-sufficiency that focuses the attention of those who argue that agricultural trade liberalization is bad for poor households.

Focusing on just the direct effects of agricultural trade policy reform can be misleading, however, not least because it does not take account of the fact that such reform is typically done in the context of multilateral, economy-wide liberalization. Being multilateral means that other countries' farm protection cuts raise international food prices and so less of a price fall occurs than when a country cuts its agricultural protection unilaterally. And being economy-wide means the decline in demand for farm labour is more or less than offset by a growth in demand for labour in expanding non-farm industries.

In short, at least two points are worth stressing. First, eliminating agricultural policy distortions in developed countries would increase the mean and decrease the variance of international prices for agricultural products, which would stimulate production in other countries. That suggests food self-sufficiency would rise in those low-income countries that transmit international prices to their domestic market. Second, since a high proportion of the poorest households in low-income countries

are producers and net sellers of food, they would be key beneficiaries of such reform. In both respects, therefore, food security for the vast majority of households in low-income countries should be enhanced on average. Those same households would be helped even further if they had been subject to price-depressing domestic policies and these were removed. The latter reform also boosts self-sufficiency in agricultural products and thereby boosts perceived food security even further in those economies. The households that are net buyers of food in such economies would face higher food prices, but whether they become less food secure depends also on what happens to their earnings (and/or transfers). If they are landless rural poor, their earning prospects will have risen along with the growth in demand for farm labour. As for urban households, the vast majority of them are more affluent than those in rural households and so can well afford to pay higher market prices for food. This suggests only a small proportion of households in low-income economies would be net food buyers at risk of becoming more food-insecure as a result of rising domestic food prices following trade liberalization.

### **What about APEC regional trade liberalization?**

Further MFN trade liberalization by APEC members, as promised in the declaration following the APEC Leaders' Summit in Bogor in November 1994 and confirmed in subsequent summits, continues to be in prospect. A study that examined that scenario empirically found that the welfare results depend even more heavily than the above studies on whether agriculture is included in the reform (as demanded by the APEC food-exporting countries but contrary to what APEC's Northeast Asian members want). Specifically, the welfare gains from this regional liberalization are 65 per cent greater when all goods markets are liberalized relative to the welfare gains when agriculture is excluded. (Services trade liberalization again is ignored, for want of reliable estimates of services protection rates.) Provided agriculture *is* included, this further reform by APEC economies would add one-third to the global welfare gains from the reforms under the Uruguay Round (Anderson et al. 1997b). It was therefore heartening to see that APEC leaders, at their meeting in Los Cabos, Mexico on 26-27 October 2002, agreed that one of the objectives of the Doha Round should be the abolition (not just the reduction) of all forms of subsidies on farm exports.

### **What about China's accession to WTO?**

Because China's accession to WTO involves a decline in the domestic price of some farm products, and because farm households in China are among the country's poorest, that trade reform is often pointed to as an example of one that will exacerbate poverty. To explore that possibility, a set of empirical studies was commissioned recently by the World Bank. A global economy wide numerical simulation model was used to generate the changes in product and factor prices expected from the commitments to reform that China made in its accession negotiations. These were then mapped to the earning and spending patterns of various household types and regions in China as revealed in China's rural and urban household surveys.

The conventional wisdom that China's WTO accession will impoverish its rural people, via greater import competition in its agricultural markets, need not prevail. One needs to keep in mind that, even if prices of some (land-intensive) farm products fall, those for other (labour-intensive) farm products could rise. Also, the removal of restrictions on China's exports of textiles and clothing will boost town and village enterprises, so demand for non-farm workers in rural areas may grow even if demand for farm labour in aggregate falls.

New estimates of the likely changes in agricultural prices as a result of WTO accession are drawn on to examine the factor reward implication of China's WTO accession empirically using the GTAP model. Results reported in Anderson, Ianchovichina and Huang (2002) suggest farm-nonfarm and Western-Eastern income inequality may well rise but rural-urban income inequality need not. That conclusion is supported by a more-detailed study of households by Chen and Ravallion (2002). They find negligible impacts on inequality and a small reduction in poverty in aggregate, but some variance across households and regions. Farm households tend to lose, especially those highly dependent on feed grain production (in Northeastern China) and in hinterland regions with weak links to the booming non-farm sectors and eastern provinces. But the losses are at most very small, amounting to less than 5 per cent of household income. Facilitating the transfer of some labour from less-lucrative farm activities to now-more-lucrative non-farm work could (with the usual remittances back to the farm household) be sufficient to ensure all gain from China's WTO accession.

The study by Anderson, Ianchovichina and Huang (2002) also examines how much difference it could make if the *hukou* system that restricts rural-to-urban migration were to be abolished. Their results suggest that the sign of the effects could

be switched to favour the poorer farm households – albeit at the expense of the richer non-farm ones – if the remaining WTO accession-related reforms were to be accompanied by reform of the *hukou* system that allowed some members of those households to obtain higher-paying non-farm employment and repatriate earnings back to their farm family. And of course aggregate national economic welfare would be enhanced by that labour market reform as well. This illustrates the general point that gains from trade reform will be greater, the more liberal are domestic product and factor markets.

A summary of those modelling results can be seen in Table 4. Without labour market reform, WTO accession for China would slightly reduce rewards to unskilled farm labour and to agricultural land while raising rewards to all other factors of production. That suggests farm households earning less than 60% of their income from unskilled nonfarm work could be harmed (albeit only slightly) from WTO accession. If complete abolition of restrictions to off-farm migration accompanied WTO accession reforms, however, the final column of Table 4 suggests all types of farm households could be better off as more family members are attracted to higher-paying off-farm work.

In so far as China's WTO accession puts upward pressure on international farm product prices, that would have the same pro-poor consequences in other developing countries as the multilateral farm trade reform discussed above. However, the extent of that price rise and the associated increase in China's imports of farm products is going to be minor, and certainly will not, as implied by the title of Lester Brown's 1995 book, 'starve the world' (see the empirical results in Anderson et al. 1997).

### **The risk of re-instrumentation of agricultural protection**

If reducing agricultural protection/increasing market access in OECD countries is able to contribute to poverty alleviation in developing countries, then that objective will be compromised by efforts to substitute new forms of protection as traditional protective instruments are phased out. The imposition of tariff rate quotas accompanied by very high out-of-quota tariffs, and the administration of quotas so as to ensure less than full usage of them, are two ways in which agricultural protection changes following the Uruguay Round were minimized. As a result, many developing

countries are struggling to identify any significant growth in agricultural export resulting from the UR Agreement on Agriculture (Mathews 2002).

There are at least two ways in which cuts may be minimized following the Doha Round too. One is via an expansion of exempt support measures to satisfy so-called non-trade concerns related to the alleged ‘multifunctionality’ of agriculture – even though those concerns can readily be met much more directly and hence in less trade-distorting ways than is being proposed (Anderson 2000). While the proposal originated in the richest, most-protective economies, it is now being embraced by farmer groups in numerous developing countries as well. More than twenty such countries’ farm groups plus the EU met in Geneva 23-25 October 2002 and signed a declaration calling on WTO members to acknowledge that “agriculture cannot be treated in the same way as industrial sectors” because farming “fulfils a multitude of functions ...”

The other is via the adoption of stricter standards that then act as technical barriers to trade. Quarantine measures are an obvious case in point. They often add relatively large cost burdens to exporters from poorer countries because those countries do not have the same capability as developed countries to meet high standards (Wilson 2002b). Numerous developing countries have cited examples of SPS measures of OECD countries that are already significantly hindering their exports (Mathews 2002). Another is the increasing use of geographical indications and traditional expressions aimed at differentiating rich-country products, which effectively reduces the demand for substitute products from other countries. A less-obvious possibility is the restriction of imports of food products containing genetically modified organisms (GMOs). The direct effects of a ban on GMOs could help exports from developing countries that choose not to adopt GMOs even though it harms those who have already adopted GMOs (Nielsen and Anderson 2001; Anderson and Yao 2002b). But the indirect, longer-term, and potentially much larger effects are adverse for the world’s poor, namely, the disincentive effect of such restrictions on investment in agricultural biotechnologies that could lower food prices and/or raise the nutritional attributes of foods available in developing countries.

### **Conclusions and policy implications**

Low-income countries have much to gain from the WTO’s Doha Round of trade negotiations. In particular, they have a strong vested interest in working together

to push simultaneously for the freeing up of trade in both farm and textile products.<sup>5</sup> Achieving that end will require some opening up of developing economies themselves as a *quid pro quo*, but that will benefit rather than hurt the poor in their own economies -- especially if it includes reducing the relatively high levels of protection currently afforded many capital-intensive manufacturing industries and the service sector. And it will be politically easier to do in agriculture the more developed countries reform their farm policies and thereby raise the mean and reduce the variance of international food prices.

Nonetheless, in some developing countries at least, preparedness to move further down the reform path would be greater if mechanisms were introduced that increased perceived food security. How a country attains its optimal level of food security is a moot point. If a society would feel too food-insecure under *laissez faire*, bearing in mind the above considerations, then what needs to be determined is a sense of (a) its willingness to pay for more security by various means, and (b) the costs of those insurance measures. One such measure involves encouraging the holding of food stocks above those that would be commercially viable -- a public good that is explicitly allowed for in Annex 2 of the WTO's Agreement on Agriculture. The optimal level of encouragement is that which boosts stocks so that the marginal social benefit in terms of food security equals the marginal social cost of that intervention. Costs are non-trivial, however. Storage and interest costs and the costs of spoilage and quality deterioration can amount to more than 20 per cent a year. The cost part of the calculation also would need to include the risk of government failure if stocks were to be managed by an inefficient (or corrupt) public agency.

If greater domestic production capability was considered by society to be one of the desirable means of boosting food security (because of a perception that food import dependence is too unreliable), there are far less costly ways of achieving that than via farm product price supports and import protection. For example, boosting production alone, rather than also taxing consumption as with an import barrier, would be a lower-cost and less-trade-distortive means of achieving that end. Even more effective could be improvements in land tenure and more investment in the stocks of primary factors used in food production: agricultural research,<sup>6</sup> rural human capital, and rural infrastructure (Otsuka 2002). That would provide an especially high

---

<sup>5</sup> Within agriculture, developing countries' interests in Doha agenda items align closely with those of the Cairns Group of non-subsidizing agricultural-exporting countries (Bjornskov and Lind 2002). See Cairns Group (2002) for its proposal on market access in the Doha Round.

<sup>6</sup> For recent reviews of the substantial contribution that a further boost to agricultural research could do for poverty alleviation in low-income countries, see Hazell and Haddad (2001) and Ryan (2002).

payoff in situations where, as in so many countries, there has been gross underinvestment in these activities in the past. Simultaneously, production could be boosted in many low-income countries simply by better clarifying and enforcing land rights, since they are a key source of collateral for securing loans for productive investments by farm households.

Where targeted programs to boost the earning capacity of the poverty-stricken (e.g. via basic education/training) are still not enough to boost their food security in the short term, targeted consumer subsidies to provide that core group with food staples are much less costly than general subsidies to all food consumers via price-depressing agricultural policies. Food aid that is targeted to just that group could be readily provided by the international community without depressing very much the prices received by farmers in recipient countries.<sup>7</sup> And greater technical and economic cooperation in the areas of agricultural research, rural education and health, and rural infrastructure may be important co-requisites of trade policy reform if developing countries are to be convinced that they would gain unequivocally from the Doha round.

---

<sup>7</sup> If such subsidies are only paid in the towns and cities, however, this increases the risk of excessive, socially costly Harris-Todaro migration out of agriculture.

## References

- Anderson, K. (2000), 'Agriculture's Multifunctionality and the WTO', *Australian Journal of Agricultural and Resource Economics* 44(3): 475-94, September.
- Anderson, K. (2002), 'Economy-wide Dimensions of Trade Policy Reform', Ch. 2 in *Development, Trade and the WTO: A Handbook*, edited by B. Hoekman, A. Matoo and P. English, Washington, D.C.: The World Bank.
- Anderson, K. (2003), 'Agriculture, Developing Countries, and the WTO Millennium Round', Ch. 1 in *Agriculture and the New Trade Agenda From a Development Perspective*, edited by M.D. Ingco and L.A. Winters, Cambridge and New York: Cambridge University Press (forthcoming).
- Anderson, K., B. Dimaranan, T. Hertel and W. Martin (1997a), 'Asia-Pacific Food Markets and Trade in 2005: A Global, Economy-Wide Perspective', *Australian Journal of Agricultural and Resource Economics* 41(1): 19-44.
- Anderson, K., B. Dimaranan, T. Hertel and W. Martin (1997b), 'Economic Growth and Policy Reforms in the APEC Region: Trade and Welfare Implications by 2005', *Asia-Pacific Economic Review* 3(1): 1-18, April.
- Anderson, K., B. Dimaranan, J. Francois, T. Hertel, B. Hoekman and W. Martin (2001), 'The Cost of Rich (and Poor) Country Protection to Developing Countries', *Journal of African Economies* 10(3): 227-57.
- Anderson, K., E. Ianchovichina and J. Huang (2002), 'Impact of China's WTO Accession on Rural-Urban Income Inequality and Poverty', paper for the World Bank project on WTO Accession, Policy Reform and Poverty Reduction in China, World Bank, Washington, D.C., June.
- Anderson, K. and B. Hoekman (2000), "Developing Country Agriculture and the New Trade Agenda", *Economic Development and Cultural Change* 49(1): 171-80, October.
- Anderson, K. and A. Strutt (1999), 'Impact of East Asia's Growth Interruption and Policy Responses: The Case of Indonesia', *Asian Economic Journal* 13(2): 205-18, June.
- Anderson, K. and R. Tyers (1993), 'More on Welfare Gains to Developing Countries from Liberalising World Food Trade', *Journal of Agricultural Economics* 44(2): 189-204, May.
- Anderson, K. and S. Yao (2002a), 'How Can South Asia and Sub-Saharan Africa Gain From the Next WTO Round?' *Journal of Economic Integration* (forthcoming).
- Anderson, K. and S. Yao (2002b), "China, GMOs and World Trade in Agricultural and Textile Products", *Pacific Economic Review* (forthcoming).
- Berg, A. and A.O. Krueger (2002), 'Trade, Growth and Poverty', paper presented at the Annual World Bank Conference on Development Economics, Washington, D.C.
- Bjornskov, C. and K.M. Lind (2002), 'Where do Developing Countries Go After Doha? An Analysis of WTO Positions and Potential Alliances', mimeo, Danish Research Institute of Food Economics, Copenhagen.
- Bouguignon, F. and C. Morrisson (2002), 'Inequality Among World Citizens: 1820-1992', mimeo.
- Brown, L.R. (1995), *Who Will Feed China? Wake-up Call for a Small Planet*, Washington, D.C.: Worldwatch Institute.
- Cairns Group (2002), 'Negotiating Proposal on Market Access', submission to the Committee on Agriculture Special Session, JOB(02)/1126, WTO, Geneva, September.

- Chen, S. and M. Ravallion (2001), 'How Did the World's Poorest Fare in the 1990s?' mimeo, Development Research Group, World Bank. Washington, D.C.
- Chen, S. and M. Ravallion (2002), 'Household Welfare Impacts of China's Accession to the WTO', paper for the World Bank project on WTO Accession, Policy Reform and Poverty Reduction in China, World Bank, Washington, D.C., Oct.
- Collier, P. and D. Dollar (2002), *Globalization, Growth, and Poverty*, New York: Oxford University Press for the World Bank.
- Diao, X., A. Somwaru and T. Roe (2001), 'A Global Analysis of Agricultural Reform in WTO Member Countries', Background paper for a USDA project on Agricultural Policy Reform in the WTO: The Road Ahead, ERS-E01-001, Washington, D.C.: US Department of Agriculture.
- Dollar, D. and A. Kraay (2002), 'Growth is Good for the Poor', *Journal of Economic Growth* (forthcoming).
- Francois, J. (2001), *The Next WTO Round: North-South Stakes in New Market Access Negotiations*, Adelaide: Centre for International Economic Studies and Rotterdam: Tinbergen Institute.
- Findlay, C.C. and A. Warren (eds.) (2000), *Impediments to Trade in Services: Measurement and Policy Implications*, London: Routledge.
- Francois, J. (2001), *The Next WTO Round: North-South Stakes in New Market Access Negotiations*, Adelaide: Centre for International Economic Studies and Rotterdam: Tinbergen Institute.
- Francois, J. and A. Strutt (1999), 'Post-Uruguay Round Tariff Vectors for GTAP Version 4', Erasmus University manuscript, Rotterdam.
- Francois, J.F. and I. Wooten (2000), 'Trade in International Transport Services: The Role of Competition', CEPR Discussion Paper No. 2377, London: Centre for Economic Policy Research, February.
- Hagen, R.J., O. Maestad and A. Michelsen (2001), 'Economic Impact on the Least Developed Countries of the Elimination of Import Tariffs on Their Products', Bergen: Norwegian School of Economics and Business Administration, May.
- Harrison, W. J. and K. R. Pearson (1996), 'Computing Solutions for Large General Equilibrium Models Using GEMPACK', *Computational Economics* 9: 83-172.
- Hazell, P. and L. Haddad (2001), 'Agricultural Research and Poverty Reduction', IFPRI Discussion Paper 34, Washington, D.C.: International Food Policy Research Institute, August.
- Hertel, T.W. (ed.) 1997. *Global Trade Analysis: Modeling and Applications*, Cambridge and New York: Cambridge University Press.
- Hertel, T., K. Anderson, J. Francois, B. Hoekman and W. Martin (1999), 'Agriculture and Non-agricultural Liberalization in the Millennium Round', Paper for the World Bank/WTO Conference on Agriculture and the New Trade Agenda from a Development Perspective, Geneva, 1-2 October.
- Hoekman, B. (1996), 'Assessing the General Agreement on Trade in Services', Ch. 4 in *The Uruguay Round and the Developing Countries*, edited by W. Martin and L.A. Winters, Cambridge and New York: Cambridge University Press.
- Hoekman, B., C. Michalopoulos, M. Schiff and D. Tarr (2001), 'Trade Policy Reform and Poverty Alleviation', World Bank Trade Working Paper # 2773, Washington, D.C., December.
- Hoekman, B., F. Ng and M. Olarreaga (2002), 'Eliminating Excess Tariffs on Exports of Least Developed Countries', *World Bank Economic Review* 16: 1-21, January.
- Ianchovichina, E., A. Mattoo and M. Olarreaga (2001), 'Unrestricted Market Access for Sub-Saharan Africa: How Much is it Worth and Who Pays? CEPR

- Discussion Paper No. 2820, London: Centre for Economic Policy Research, June.
- Martin, W. (2001), 'Trade Policies, Developing Countries, and Globalization', in *Globalization*, Policy Research Report, Washington, D.C.: The World Bank.
- Martin, W. and L.A. Winters (eds.) (1996), *The Uruguay Round and the Developing Countries*, Cambridge and New York: Cambridge University Press.
- Mathews, A. (2002), 'Developing Country Experience With the Implementation of the Uruguay Round Agreement on Agriculture: Synthesis of the Findings of 23 Country Case Studies', FAO Geneva Symposium on Implementing the WTO's URAA, 2 October.
- McCulloch, N., L.A. Winters and X. Cirera (2001), *Trade Liberalization and Poverty: A Handbook*, London: Centre for Economic Policy Research.
- McDougall, R.A., A. Elbehri and T.P. Truong (1998) (eds.) *Global Trade, Assistance, and Protection: The GTAP 4 Data Base*. Center for Global Trade Analysis, Purdue University, West Lafayette.
- Nielsen, C. and K. Anderson (2001), 'Global Market Effects of European Responses to Genetically Modified Organisms', *Weltwirtschaftliches Archiv* 137(2): 320-46, June.
- Otsuka, K. (2002), 'Poverty reduction Issues: Village Economy Perspective', *Asian Development Review* 19(1): 98-116.
- Ryan, J. (2002), 'Agricultural Research and Poverty Alleviation: Some International Perspectives', paper presented to the John Dillon Commemorative Conference, University of New England, Armidale, 20 September.
- Sala-i-Martin, X. (2002), 'The World Distribution of Income (Estimated from Individual Country Distributions)', NBER Working Paper 8933, Cambridge MA, May.
- UNCTAD/Commonwealth Secretariat (2001), *Duty and Quota Free Market Access for LDCs: An Analysis of Quad Initiatives*, Geneva: UNCTAD and London: Commonwealth Secretariat.
- Wilson, J.S. (2002a), 'Liberalizing Trade in Agriculture: Developing Countries in Asia and the Post-Doha Agenda', paper presented to the ADB Institute Workshop, Singapore, 16-24 April.
- Wilson, J.S. (2002b), 'Standards, Trade and Development: What is Known and What do we Need to Know?' Paper presented at the Roundtable on Informing the Doha Process: New Research for Developing Countries, Cairo, 20-21 May.
- Winters, L.A. (2000), 'Trade, Trade Policy and Poverty: What Are the Links?' Background paper for the World Bank's *World Development Report 2000/01*, January.
- Winters, L.A., N. McCulloch and A. McKay (2002), 'Trade Liberalization and Poverty: Empirical Evidence', mimeo, University of Sussex, September.
- World Bank (2001), *Global Economic Prospects and the Developing Countries 2002: Making World Trade for the World's Poor*, Washington, D.C.: The World Bank.
- WTO (2001a), *Market Access: Unfinished Business: Post-Uruguay Round Inventory and Issues*, Special Study No. 6, Geneva: World Trade Organization.
- WTO (2001b), *Doha WTO Ministerial 2001: Ministerial Declaration*, WT/MIN(01)/DEC/1, Geneva: World Trade Organization, 14 November.

Table 1: Average tariff equivalents of import market access barriers to goods trade, by source and destination region, 1995

(per cent)

<i>Exporting region<sup>b</sup>:</i>	<i>Importing Region:</i>		<i>World</i>
	<i>High Income</i>	<i>Low Income</i>	
<b>Agriculture</b>			
<i>High Income</i>	16	22	18
<i>Low Income</i>	15	18	16
<b><i>World</i></b>	<b>16</b>	<b>20</b>	<b>17</b>
<b>Manufactures</b>			
<i>High Income</i>	1	11	4
<i>Low Income</i>	3	13	7
<b><i>World</i></b>	<b>2</b>	<b>12</b>	<b>5</b>
<b>Minerals/energy</b>			
<i>High Income</i>	0.1	1.3	0.4
<i>Low Income</i>	0.4	5.2	2.4
<b><i>World</i></b>	<b>0.2</b>	<b>3.0</b>	<b>1.1</b>

Source: Hertel et al. (1999).

Table 2: Sectoral and regional contributions to economic welfare gains<sup>a</sup> from completely removing trade barriers globally, post-Uruguay Round, 2005

*(a) in 1995 US\$ billions*

<b>Liberalizing Region<sup>b</sup>: Benefitting region<sup>b</sup>:</b>	Agriculture and Food	Other Primary	Textiles & Clothing	Other Manufactures	Total
<b>High Income</b>					
<i>High Income</i>	110.5	-0.0	-5.7	-8.1	96.6
<i>Low Income</i>	11.6	0.1	9.0	22.3	43.1
<b>Total</b>	<b>122.1</b>	<b>0.0</b>	<b>3.3</b>	<b>14.2</b>	<b>139.7</b>
<b>Low Income</b>					
<i>High Income</i>	11.2	0.2	10.5	27.7	49.6
<i>Low Income</i>	31.4	2.5	3.6	27.6	65.1
<b>Total</b>	<b>42.6</b>	<b>2.7</b>	<b>14.1</b>	<b>55.3</b>	<b>114.7</b>
<b>All Countries</b>					
<i>High Income</i>	121.7	0.1	4.8	19.6	146.2
<i>Low Income</i>	43.0	2.7	12.6	49.9	108.1
<b>Total</b>	<b>164.7</b>	<b>2.8</b>	<b>17.4</b>	<b>69.5</b>	<b>254.3</b>

*(b) in per cent of total global gains*

<b>Liberalizing Region: Benefitting region</b>	Agriculture and Food	Other Primary	Textiles & Clothing	Other Manufactures	Total
<b>High Income</b>					
<i>High Income</i>	43.4	0.0	-2.3	-3.2	38.0
<i>Low Income</i>	4.6	0.1	3.5	8.8	16.9
<b>Total</b>	<b>48.0</b>	<b>0.0</b>	<b>1.3</b>	<b>5.6</b>	<b>54.9</b>
<b>Low Income</b>					
<i>High Income</i>	4.4	0.1	4.1	10.9	19.5
<i>Low Income</i>	12.3	1.0	1.4	10.9	25.6
<b>Total</b>	<b>16.7</b>	<b>1.1</b>	<b>5.5</b>	<b>21.7</b>	<b>45.1</b>
<b>All Countries</b>					
<i>High Income</i>	47.9	0.1	1.9	7.7	57.5
<i>Low Income</i>	16.9	1.0	4.9	19.6	42.5
<b>Total</b>	<b>64.8</b>	<b>1.1</b>	<b>6.8</b>	<b>27.3</b>	<b>100.0</b>

<sup>a</sup> No account is taken in these calculations of the welfare effects of environmental changes associated with trade liberalization, which could be positive or negative depending in part on how environmental policies are adjusted following trade reforms.

<sup>b</sup> High and low income here are short-hand for developed and developing countries.

Source: Anderson (2003).

Table 3: Decomposition of economic welfare gains<sup>a</sup> for various regions from the complete removal of trade barriers globally, post-Uruguay Round, 2005

(in 1995 US\$ billions)

	<b>Gain from improved resource use efficiency</b>	<b>Gain from the change in terms of trade</b>	<b>TOTAL WELFARE GAIN</b>
NEAsia	86,635	11,497	95,172
SEAsia	18,710	-7,233	10,934
China	18,619	-9,913	9,053
India	12,596	-4,808	7,414
OtherSAsia	10,452	-3,128	6,245
Australia/NZ	1,016	5,852	6,702
NthAmerica	8,028	13,150	20,476
Mexico	2,240	-1,927	867
SouthernCone	15,767	-3,111	11,816
OtherLatinAm	2,009	3,690	5,562
Weurope	55,712	-6,401	50,130
EEFSU	2,935	5,985	8,860
MidEastNAfr	9,642	-3,426	5,565
SthAfrica	3,515	1,196	4,589
OthSubSahara	1,198	-715	520
Rest of World	6,976	-1,257	4,748

Source: Anderson and Yao (2002a).

Table 4: Changes in China's real factor prices and national economic welfare due to its WTO accession, 2001 to 2007

(per cent and, for national welfare, 1997 US\$ billions)

	Core WTO accession scenario	Alternative scenario: core case plus also removing labour market distortion
<b>Factor rewards:</b>		
Farm unskilled wages	-0.7	16.8
Rental price of land	-5.5	-9.7
Nonfarm unskilled wages	1.2	-3.8
Skilled labor wages	0.8	-1.7
Rental price of capital	1.3	-1.4
<b>Farm household income<sup>a</sup>:</b>		
Farm household type-A	-1.6	6.8
Farm household type-B	-0.8	3.6
Farm household type-C	0.1	0.4

<sup>a</sup> Farm income from agriculture is made up of 57% from unskilled farm labour, 26% from agricultural land and 17% from farm capital, according to the GTAP database. In 1999 on average 51% of rural household income in China was earned outside agriculture, mostly from unskilled labour. Therefore, to illustrate the importance of those off-farm earnings for farm families, three types of farm households are shown in this table: it is assumed nonfarm unskilled labour contributes 0% of total farm household income for type A, 30% for type B, and 60% for type C.

Source: Anderson, Ianchovichina and Huang (2002).

## CIES DISCUSSION PAPER SERIES

The CIES Discussion Paper series provides a means of circulating promptly papers of interest to the research and policy communities and written by staff and visitors associated with the Centre for International Economic Studies (CIES) at the Adelaide University. Its purpose is to stimulate discussion of issues of contemporary policy relevance among non-economists as well as economists. To that end the papers are non-technical in nature and more widely accessible than papers published in specialist academic journals and books. (Prior to April 1999 this was called the CIES Policy Discussion Paper series. Since then the former CIES Seminar Paper series has been merged with this series.)

**Copies of CIES Policy Discussion Papers may be downloaded from our Web site at <http://www.adelaide.edu.au/cies/> or are available by contacting the Executive Assistant, CIES, School of Economics, Adelaide University, SA 5005 AUSTRALIA. Tel: (+61 8) 8303 5672, Fax: (+61 8) 8223 1460, Email: [cies@adelaide.edu.au](mailto:cies@adelaide.edu.au). Single copies are free on request; the cost to institutions is US\$5.00 overseas or A\$5.50 (incl. GST) in Australia each including postage and handling.**

**For a full list of CIES publications,** visit our Web site at <http://www.adelaide.edu.au/cies/> or write, email or fax to the above address for our *List of Publications by CIES Researchers, 1989 to 1999* plus updates.

- 0234 Anderson, Kym, "Agricultural Trade Reform and Poverty Reduction in Developing Countries", November 2002.
- 0233 Wood, Danielle and Kym Anderson, "What Determines the Future Value of an Icon Wine? Evidence from Australia", November 2002.
- 0232 Kym Anderson and Nielsen, Chantal, "Economic Effects of Agricultural Biotechnology Research in the Presence of Price-distorting Policies". November 2002.
- 0231 Jackson, Lee Ann, "Who Benefits from Quality Labelling? Segregation Costs, International Trade and Producer Outcomes". November 2002.
- 0230 Rajan, Ramkishen, "Trade Liberalization and Poverty: Where Do We Stand?", November 2002.
- 0229 Rajaguru, Gulasekaran and Reza Siregar, "Sources of Variations Between the Inflation Rates of Korea, Thailand and Indonesia During the Post-1997 Crisis", November 2002.
- 0228 Barbier, Edward B, "Water and Economic Growth", October 2002.
- 0227 Barbier, Edward B, "The Role of Natural Resources in Economic Development", October 2002. (The 49<sup>th</sup> Joseph Fisher Lecture.)
- 0226 Rajan, Ramkishen and Rahul Sen, "Liberalisation of Financial Services in Southeast Asia under the ASEAN Framework Agreement on Services (AFAS)", October 2002. (Forthcoming in *Journal of International Banking Law*).
- 0225 Anderson, Kym "Building an Internationally Competitive Australian Olive Industry: Lessons from the Wine Industry," October 2002.
- 0224 Bentzen, Jan, Søren Leth-Sørensen and Valdemar Smith, "Prices of French Icon Wines and the Business Cycle: Empirical Evidence from Danish Wine Auctions," September 2002.
- 0223 Bentzen, Jan and Valdemar Smith, "Wine Prices in the Nordic Countries: Are They Lower Than in the Region of Origin?" September 2002.
- 0222 Rajan, Ramkishen and Graham Bird, "Will Asian Economies Gain from Liberalizing Trade?"

- Trade in Services?" September 2002. (Forthcoming in *Journal of World Trade*).
- 0221 Siregar, Reza Y. and Gulasekaran Rajaguru, "Base Money and Exchange Rate: Sources of Inflation in Indonesia during the Post-1997 Financial Crisis" August 2002.
- 0220 Rajan, Ramkishen, "International Financial Liberalisation in Developing Countries: Lessons from Recent Experiences" July 2002. (Published in *Economic and Political Weekly*, 37 (29): 3017-21, July 20-26, 2002).
- 0219 Rajan, Ramkishen, Reza Siregar and Graham Bird, "Capital Flows and Regional Financial Interdependencies in the Context of Crises: Evidence From East Asia" August 2002.
- 0218 Bird, Graham and Ramkishen Rajan, "The Political Economy of A Trade-First Approach to Regionalism", July 2002.
- 0217 Ramkishen, Rajan and Rahul Sen, "Liberalisation of International Trade in Financial Services in Southeast Asia: Indonesia, Malaysia, Philippines and Thailand", July 2002. (Since published in *Journal of International Financial Markets* 4(5): 170-80, 2002).
- 0216 Anderson, Kym, "International Trade and Industry Policies", July 2002. (Forthcoming in *The Cambridge Handbook of Social Sciences in Australia*, edited by I. McAllister, S. Dowrick and R. Hassan, Cambridge: Cambridge University Press, 2003).
- 0215 Anderson, Kym, "The New Global Economy: Opportunities and Challenges for Small Open Economies", July, 2002. (Forthcoming as Ch. 3 in *Sustaining Singapore's Competitiveness in the New Global Economy*, edited by R. Rajan, London: Edward Elgar, 2003).
- 0214 Pincus, Jonathan, "Environmental Economics and the Murray-Darling", July 2002.
- 0213 Brennan, Geoffrey and Jonathan Pincus, "From the Australian Settlement to Microeconomic Reform: the Change in Twentieth Century Policy Regimes", July 2002.
- 0212 Teuku Rahmatsyah, Gulasekaran Rajaguru and Reza Y. Siregar, "Exchange Rate Volatility, Trade and 'Fixing for Life' in Thailand", June 2002.
- 0211 Anderson, Kym, Jikun Huang and Elena Ianchovichina, "Impact of China's WTO Accession on Farm-Nonfarm Income Inequality and Rural Poverty", November 2002.
- 0210 Bird, Graham and Ramkishen Rajan, "Too Much of a Good Thing? The Adequacy of International Reserves in the Aftermath of Crises", April 2002. (Forthcoming in *The World Economy*.) (Forthcoming in *Trading Arrangements in the Pacific Rim*, edited by P. Davidson, New York: Oceana Publications.)
- 0209 Anderson, Kym, "Measuring Effects of Trade Policy Distortions: How Far Have We Come?" April 2002. (Forthcoming in *The World Economy* Vol. 25, 2002).
- 0208 Rajan, Ramkishen and Rahul Sen, "The Japan-Singapore "New Age" Economic Partnership Agreement: Background" March 2002. (Abbreviated version published in *Economic and Political Weekly* 37(26): 2565-6, 2002).
- 0207 Anderson, Kym, "Peculiarities of Retaliation in WTO Dispute Settlement" March 2002. (Since published in *World Trade Review* 1(2): 123-34, July 2002.)
- 0206 Jackson, Lee Ann, "Is Regulatory Harmonization Efficient? The Case of Agricultural Biotechnology Labelling." March 2002
- 0205 Siregar, Reza and Ramkishen S. Rajan, "Impact of Exchange Rate Volatility on Indonesia's Trade Performance in the 1990s", March 2002.
- 0204 Zhao, Xueyan, Kym Anderson and Glyn Wittwer, "Who Gains from Australian Generic Wine R & D and Promotion?" February 2002.