Volume 4 Number 2, 2003/p.98-122 esteyjournal.com

The Estey Centre Journal of
International Law and Trade Policy

The Current Round of Agricultural Trade Negotiations: Should We Bother About Domestic Support?*

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The current WTO agricultural trade negotiations began in March 2000 and became part of the Doha Development Agenda in late 2001. The previous Uruguay Round reached agricultural agreements in the areas of market access, export competition and domestic support. The current round is seeking agreements under similar headings. The effort to reach agreement over reductions in domestic support to farmers is complicated by a number of factors,for example, the extent to which such support affects production decisions, the wishes of governments to support farmers for pursuing multifunctional outcomes from agriculture, and the categorisation of a myriad of policy instruments into green, blue and amber boxes. These complications pose the risk of considerably extending the negotiations and diverting attention away from other areas of reform. But the sustainability of many domestic support policies depends on trade barriers, and reform of these trade barriers may force governments into reforming domestic support without requiring specific international agreements. We use the GTAP applied general

equilibrium model to quantify and analyse a number of trade reform scenarios, with and without specific changes in domestic support. We conclude that substantial trade expansion and welfare gains can be achieved, even when domestic support is excluded from the multilateral agreement. Improved market access makes a far greater contribution to welfare gains than do reforms to domestic policies, and once substantive reforms to border policies have been achieved attention can then be turned to the lower-priority task of reforming domestic support.

Keywords: agricultural policy reform, CGE modelling, decoupled policies, domestic support, WTO

Introduction

The Uruguay Round Agreement on Agriculture (URAA) grouped reform commitments under the major headings of market access, export competition and domestic support. Inclusion of the latter was seen by many as an important breakthrough, since it indicated recognition that domestic agricultural policies do link to international trade. However, the agreed reductions in domestic support in the URAA (as set out in articles 6 and 7 and the schedules of each member) have been the least effective of the three major areas of reform in contributing to any subsequent liberalisation of global food and agricultural markets. There are several reasons for this.

The URAA specified 20 percent reductions (13.3 percent for developing countries) in domestic support expenditures from an agreed base, as calculated in the aggregate measurement of support (AMS). Qualifying policy instruments were grouped into three categories (the "amber", "blue" and "green" boxes) depending upon their perceived abilities to impact on production and to distort trade flows, and the agreed expenditure reduction applied only to those expenditures included in the amber box (such as output price support and input subsidies). With few exceptions countries have adjusted their domestic support policies so as to comply with this agreement. The general achievement of country commitments was facilitated by the fact that they were computed from the extremely high domestic supports of the 1986-88 base period.

A contributing factor to this outcome was the invention of the blue box towards the end of the Uruguay Round negotiations, allowing the EU and the United States to exempt their major domestic support programmes from cuts. These are production-limiting programmes where payments are based on fixed crop areas and yields or fixed livestock numbers. While such exemptions have been claimed mainly by the EU and the United States, in early 2001 Japan claimed blue-box exemption for certain support to rice from 1998, referring to policy changes that would allow it to not include in the AMS considerable support previously notified as market price support (Kennedy et al., 2001).

While the AMS was calculated on a product-by-product basis, it was the *sum* of those expenditures that was to be reduced. Hence countries could make larger cuts in support to non-sensitive farm sectors, allowing support levels to be maintained or even increased in the more politically sensitive sectors. Also, the *de minimis* provision allowed the exclusion from the AMS of domestic commodity support that comprised

less than 5 percent (10 percent for developing countries) of the total production value of the relevant commodity.

Qualifying for the green box, and therefore exempt from reductions, are expenditures associated with programmes that have no, or at most minimal, trade-distorting effects or impacts on production. These include such instruments as government-funded general services, direct payments to producers, and payments associated with disaster relief, income insurance, environmental programmes and structural adjustment. Developing countries have been able to include a somewhat larger set of policies in the green box. The question of whether all payments reported in the green box have few or no production or trade effects requires further investigation (OECD, 2001). Some would argue that the green-box policies, as defined by current criteria, do in some cases result in production and/or trade distortions.

In the 1986-88 base period, domestic support was dominated by amber-box measures. During the implementation period, however, green-box expenditures increased as amber-box measures declined. For the OECD countries as a whole, green-box spending was around one-quarter of total domestic support in the base period, but had increased to almost half by 1996 (OECD, 2001). This trend may continue should the EU be successful in implementing proposed reforms (22 January 2003) to further decouple support from world prices by introducing a single farm payment independent from production. The URAA domestic support measures have been successful to the extent that countries have reformed some policies and have shifted their support emphasis from the amber-box instruments to those of the blue and green boxes. This should have reduced somewhat the production and trade distortions due to domestic farm supports.

The Doha Agricultural Negotiations and Domestic Support

A new WTO round of agricultural trade negotiations began in March 2000. These talks have now been incorporated into the broader negotiating agenda set at the 2001 Ministerial Conference in Doha, Qatar. WTO member countries face two basic issues in their negotiations over domestic support. The first is whether and how to categorise support instruments into various “boxes”, and the second is the scope of reduction of such categories of support. Some developing countries propose no categorisation but that the total domestic support of industrial countries be capped, while others propose that developed countries reduce support payments across all

boxes. Still other developing countries favour retention of the green box but require developed countries' spending in the blue and amber boxes to be substantially reduced and eventually cut to zero. Many developing (and other) countries also favour a "development" box that would include additional domestic support policies that would be for them exempt from reductions, such as those policies that address support of small-scale subsistence farmers. Of the developed countries, the United States has proposed the merging of the amber and blue boxes, with spending in this combined box limited to 5 percent of the value of agricultural production. The United States has proposed maintaining the basic criteria for the green box.[1] The Cairns Group has proposed the reduction of amber-box spending to zero over five years with a 50 percent down-payment by developed countries in the first year of implementation, and the elimination of the exemptions on blue-box spending. It also has proposed a substantive revision of green-box criteria to ensure such support does not distort production and trade.[2] The EU has proposed retention of all three existing boxes with amber-box support being further reduced by 55 percent.[3]

One of the thorniest negotiating issues is accommodation of the non-trade concerns of several member countries – including the so-called multifunctionality issues.[4] In particular, better definitions are required of minimally trade-distorting policies that might be used by countries in their pursuit of important societal objectives. Korea proposes that the scope and criteria of the green box be adjusted so as to reflect the multifunctionality of agriculture, for example by including compensatory supports for multifunctionality. The EU proposes that measures aimed at meeting important societal goals (e.g., environmental protection, rural vitality and poverty alleviation) should be accommodated. Several other countries have also noted the right of members to address non-trade concerns, provided this is achieved in minimally trade-distorting ways. In contrast, ASEAN and other developing countries have suggested an overall cap on developed-country expenditures on total green-box supports (Kennedy et al., 2001).

Reaching political agreement on multifunctionality and other green-box concerns would seem to require, *inter alia*, additional and probably rather complex political and economic analyses. What *is* an acceptable minimum level of trade distortion? How *do* various "multifunctional" programmes impact on production? *Should* we be concerned if an efficient public policy to provide a positive externality increases farm output as a by-product? And more generally in regard to green-box policies, what is the nature of "decoupling"? Since domestic support forms part of the current agricultural trade negotiations, the above conflicting positions and analytical

complexities may prolong the negotiations, and perhaps even pose a threat to a successful completion that would incorporate a meaningful liberalisation of agricultural trade. This raises the question of whether the agricultural trade negotiations could still result in a meaningful outcome in the absence of disciplines on domestic support (Blandford, 2001; Sumner, 2000) – the subject of the remainder of this paper.

Because the amber, blue and green boxes of domestic support categories may be treated differently in the current trade negotiations (as they were in the URAA), it is useful to provide a mapping from these boxes to domestic support as measured in the Global Trade Analysis Project (GTAP) database used below (see the technical annex). The components of the AMS are not exactly the same as those of domestic support as measured within the producer support estimate (PSE) but the latter are available in the GTAP database. For example, the AMS also includes market price support delivered through administered price schemes, but since these are often applied in combination with tariffs or export subsidies, such support is accounted for in the GTAP database by the relevant trade policy instrument. The chosen mapping is:

- amber (non-exempt) box – proxied here by output subsidies and intermediate input subsidies
- blue and green (exempt) boxes – proxied here by land-based and capital-based payments.

In our quantitative analyses, selected shocks will be applied to these two categories of domestic support policy variables, which we shall refer to hereinafter as non-exempt and exempt support.

Linkages between Domestic Support and Trade

Given that farmers are generally risk averse, even apparently fully decoupled direct payments including those to reduce risk or to compensate for climatic disasters would appear to have some impact on production through reducing revenue variance, through relaxing debt constraints, and by increasing wealth and moving farmers to less risk-averse regions of their utility functions. Tying direct payments to past levels of inputs or outputs may affect current farm decisions, since it may persuade farmers to increase output in order to influence possible future base production/area data (such as in the 2002 U.S. Farm Bill, which gave farmers the opportunity to update their base acreages). Direct payments may also influence future output through new investments, or may protect some farm businesses from

bankruptcy (Rude, 2000; Young and Westcott, 2000; Burfisher, Robinson and Theirfelder, 2000).

A relevant question is, What would be the impact on global trade if certain governments responded to trade reforms by increasing their green/blue-box spending and such increased spending had an impact on production and trade? This gives rise to the related question, How decoupled is green/blue-box spending from output and trade? In reality such payments may not be completely decoupled from production and trade for reasons mentioned above, though the limited evidence currently available suggests the degree of coupling is not strong. Young and Westcott (2000) examined the links from four U.S. programmes[5] to exports. They concluded that exports were marginally increased as a result of these programmes and that production flexibility payments were the least directly coupled to production. Burfisher, Robinson and Theirfelder (2000) modelled direct farm payment programmes in Canada, the United States and Mexico and simulated that a 50 percent increase in direct payments would increase output of major crops by 1 percent or less. They concluded that the effects of increased direct payments on output were relatively small. Hoekman, Ng and Olarreaga (2002) estimated a net import demand function with import tariffs and exempt and non-exempt domestic support payments included amongst the explanatory variables. Using cross-section data covering many countries and commodity groups, elasticities of net import demand with respect to both exempt and non-exempt support payments were computed. Over all commodities and countries the elasticity for non-exempt support was estimated as -0.10 (i.e., a 10 percent increase in non-exempt support would encourage a 1 percent decrease in net import demand), while that for exempt support was negative but not significantly different from zero. The non-exempt support elasticities were also separately estimated for the EU, the United States and Japan as -0.08, -0.09 and -0.12 respectively.

How responsive is trade to changes in domestic support payments in the GTAP model employed here (see the technical annex)? Increases in the output subsidy will enlarge the gap between producer and market prices, and encourage an outward shift of commodity supply curves. Increases in subsidy payments to land and capital will increase the quantity demanded and lower the price of those factors to producers, depending *inter alia* on the elasticity of factor supply. While the total supply of land is exogenous in the GTAP model we use, its supply is not fixed for individual agricultural commodities. The changes in land allocation to the various agricultural commodities will be influenced by the "sluggishness" of the resource and the degree of substitution among land and other factors.[6] To answer the question, we ran six

simulations, each increasing the total spending on either non-exempt or exempt support payments across all farm sectors by 10 percent for the EU, the United States and Japan. From the results we computed the percentage changes in total agricultural and food exports, imports and net imports.[7]

Results are given in table 1 and, for net import elasticities of non-exempt support, compared with the econometric estimates of Hoekman, Ng and Olarreaga. For non-exempt support, the net import elasticities are all negative and, like the elasticities of Hoekman, Ng and Olarreaga, are very inelastic. The impact of this kind of support on increasing exports or decreasing imports tends to be even lower.[8] Net import elasticities with respect to exempt domestic support payments are less elastic (closer to zero) than those for non-exempt payments, and in this respect results are again consistent with the Hoekman, Ng and Olarreaga findings.[9]

Table 1 Agricultural & Food Trade Volume[1] Elasticities with Respect to Domestic Support Payments

	EU	US	Japan
Exempt ("blue/green")			
Exports	0.012	-0.019	0.010
Imports	0.002	0.021	-0.002
Net imports	-0.122	0.125	-0.003
Non-exempt ("amber")			
Exports	0.011	0.04	0.010
Imports	0.003	-0.003	-0.004
Net imports [2]	-0.133	-0.151	-0.005
	(-0.08)	(-0.09)	(-0.12)

Note: 1 Aggregated over all agricultural and food commodities using base-period prices.

2. Elasticity estimates of Hoekman, Ng and Olarreaga in parentheses.

Design of Policy Simulations

The objective of our analytical work is to indicate how some possible outcomes of the current Doha Round with regard to domestic support might impact on agricultural trade and national welfare, and to consider the size of such impacts

relative to those due to possible liberalisation of border (trade) policies. The findings will then be used in an attempt to answer the question, Should we bother about domestic support?

Simulation #1: Base Scenario Agricultural Trade Reform

Our first simulation incorporates one possible approach to reforming agricultural trade policies, but includes no reforms to domestic support policies. Gains from these trade policy reforms will be used as a benchmark against which we will compare the gains from approaches to reforming domestic support payments.[10] While some countries (including developing countries, the Cairns Group and the United States) have proposed deep tariff cuts using a formula approach that reduces high tariffs by more than low ones, others including the EU have proposed a similar formula as was used in the URAA. To err on the conservative side, in our simulation we incorporate 36 percent reductions to import tariffs levied by developed countries,[11] with a lower 24 percent reduction required from remaining WTO members.

Of the US $27 billion spent in total by WTO members subsidising exports between 1995 and 1998, the EU accounted for nearly 90 percent, and Switzerland, the United States and Norway together another 9 percent. Over this period, the EU subsidised almost all its exports of coarse grains, butter and skim-milk powder, and beef, as well as most of its other dairy exports and wheat. Country position papers submitted to the WTO as part of the current negotiations indicate a high level of commitment to reduce the levels of export subsidies. In this simulation we make 36 percent cuts in the total expenditures on agricultural export subsidies (as in the URAA), applied only to developed-country exporters.

Simulation #2: Reduction of Non-exempt Support

Our remaining simulations include the trade policy reforms as described in the above base case scenario, but we also introduce some approaches to dealing with domestic support policies in the WTO negotiations. In the second simulation, total spending on non-exempt support (output subsidies and intermediate input subsidies) is reduced. There appears to be widespread support for this in the current round. Proposals include reductions calculated from the URAA final bound level of spending as measured by the AMS, including reductions calculated at the product-specific level rather than on the total AMS, reduction of the *de minimis* clause for developed countries and a programme of reductions that would eventually eliminate this category of support. Given the tenor of these proposals, we model a doubling of the reduction

agreed to in the URAA and apply a 40 percent reduction to total non-exempt spending, in developed countries only. These cuts are applied on a commodity-by-commodity basis, rather than to their sum over the farm sector as a whole, and the different kinds of non-exempt support (output and input subsidies) are reduced by the same percentage.

Some developing countries have proposed that a cap be placed on the blue- and/or green-box spending of developed countries (Kennedy et al., 2001). We model this by fixing total exempt spending of the developed countries at base-period levels. Several countries have proposed that additional criteria for exempt domestic support be created for developing countries to provide them with the flexibility to increase domestic support in recognition of their development needs and objectives, so no such cap on blue- and green-box spending in developing countries is included.

Simulations #3 and #4: Reform of Exempt Support

These simulations incorporate the same reforms to border policies and non-exempt support as are included in the second simulation. In addition, simulation #3 extends the reductions in domestic support payments to the exempt categories. Many countries have proposed the reduction or elimination of spending within the blue box, and several also propose a tightening of the criteria that apply to policies included in the green box. Accordingly, we model a reduction in both non-exempt and exempt payments by 40 percent, in developed countries only.

In contrast, the final simulation recognises the likelihood that at least some countries could respond to the trade policy and non-exempt support payment reforms by *increasing* their payments that are currently not subject to limitation (a re-instrumentation of policies that might, for example, aim to provide compensation to farmers for income cuts due to the border and non-exempt payment reforms). Since 1997 (the base period of our data) total spending within these exempt categories has increased in some countries – for example, by over 40 percent in the United States over the 1997-2001 period using our OECD-based definition of exempt support (OECD, 2002). Such increases need not be confined to those amounts required to compensate for income losses due to trade-policy and amber-box reforms. Indeed, current proposals to the WTO include some from developed countries that could permit them (and others) to increase green-box spending by including that aimed at meeting important societal goals including those of multifunctionality. To illustrate possible impacts of such a scenario, this simulation simulates 40 percent increases in total exempt domestic payments within all farm sectors in all developed countries.

Results

The modelled cuts to export subsidies and import tariffs in simulation #1 increased global welfare, as measured by an equivalent variation in income, by over US $16 billion (table 2). Adding reductions in non-exempt (amber-box) domestic subsidies to those reforms had little impact on the global welfare gain, with the increase less than 1 percent. When, in addition to these reforms, countries of the developed world also make reductions to their currently exempt (blue- and green-box) payments, the additional gain in global welfare is projected to be almost 40 percent more than in the second simulation. However, most of this gain accrues to the EU as the major current user of such farm payments, with smaller gains also enjoyed by Australasia and North America.

Table 2 Changes in Welfare due to Policy Liberalisations (US$ million)

	Exp#1	Exp#2	Exp#3	Exp#4
AUS	361	474	561	411
EU	3,912	4,063	9,085	-3,306
NZL	410	451	493	431
CAN	569	746	904	617
US	972	1,519	2,397	609
ASIA	1,378	1,203	1,253	1,131
JPN	2,111	1,754	1,756	1,655
KOR	502	420	405	422
EFTA	2,237	2,305	2,480	2,062
C&STH_AM	1,684	1,669	1,635	1,704
ROW	2,362	2,045	1,923	2,049
Developed	10,573	11,313	17,676	2,480
Developing	5,926	5,337	5,216	5,306
Global	16,499	16,650	22,892	7,786

Note: Developing regions are ASIA, KOR, C&STH_AM and ROW.

Many developing-country proposals to the current round of multilateral trade negotiations call for reductions in developed-country use of domestic support payments. It is interesting to note, therefore, that reductions in both non-exempt (simulation #2) and exempt farm payments (simulation #3) by the developed world actually reduce the welfare gains of developing regions. Why do the reductions in

domestic support payments impact negatively on developing regions' welfare? There are at least two reasons. One is that the resulting global commodity price increases dampen the downward farm output adjustment in developing economies where output is protected through tariffs. Consequently, too many resources are retained in sectors where these countries do not have a comparative advantage, and allocative efficiency losses are incurred. The second reason is that some developing regions are net importers of food, and the increased prices that result from reductions in domestic support negatively affect such countries' terms of trade.

The fourth simulation models the welfare consequences of a degree of re-instrumentation on the part of those developed countries that currently make use of exempt domestic support payments. The result is a more than halving of the global welfare gains from trade reform, driven by large welfare losses in the EU, and to a lesser extent in the United States, where increased payments to farm land and capital encourage expansion of subsidised agriculture. However, such increased exempt payments have a negligible impact on the welfare gains of the developing world.

Since all of our simulations incorporated shocks to import tariffs and various subsidies, the decomposition of welfare changes by tariffs and subsidies will provide further insights into the results (Huff and Hertel, 2000). The first section of table 3 suggests that when the levels of various domestic farm support payments are changed in addition to trade liberalisation (simulations #2 - #4), reform of tariffs and export subsidies is still by far the major contributor to the gains for non-EU developed countries. For example, in these simulations the cuts to non-exempt payments contribute only around 7 to 10 percent of the total welfare gain. The cuts to exempt domestic support payments of simulation #3 contribute a somewhat larger positive welfare contribution, but it still amounts to only 15 percent of the total gain in welfare from that simulation. When developed countries increase their exempt farm payments, a somewhat more substantial and negative contribution to welfare gains results. The second section of table 3 provides further evidence of this by examining the same decomposition of each simulation for the European Union. The EU15 is the dominant user of exempt domestic farm subsidies, and their reduction (simulation #3) results in a substantial gain to EU15 welfare primarily due to allocative efficiency gains. The converse applies when such spending is increased (simulation #4).

Table 3 The Contribution of Various Policy Changes to Welfare (US$ millions)

Simulation	Total change	Contributions of policy categories		
		Tariffs & export subsidies	Non-exempt domestic support	Exempt domestic support
Developed Countries excluding EU15				
#1	6661	6661		
#2	7250	6661	589	
#3	8591	6693	586	1312
#4	5786	6634	592	-1440
EU15				
#1	3912	3912		
#2	4063	3853	209	
#3	9085	3926	184	4975
#4	-3306	3739	224	-7268
Developing Countries				
#1	5926	5926		
#2	5337	5937	-600	
#3	5216	5959	-579	-164
#4	5306	5923	-620	2

The final section of table 3 reports a similar analysis of the welfare gains achieved by the developing countries. The contributions of trade policy reforms to their welfare gains are even higher than in the case of developed countries. In fact, the results show that reductions in both categories of domestic support by the developed countries actually reduce welfare in the developing world, the phenomenon apparent in table 2. Furthermore, increased use of exempt payments in the developed world (simulation #4) makes almost no impact on developing countries' welfare.

Simulation #3 included reductions to trade policies as well as to exempt and non-exempt domestic farm subsidies. Results are decomposed in tables 4 and 5 to evaluate the separate contributions of these policy reforms to changes in export volumes and prices. Under this comprehensive reform scenario, global commodity export volumes increase by up to 9 percent. By far the major contribution is made by improvements in

market access via tariff reductions. Reductions in domestic support payments make a relatively small contribution and that contribution is, for most commodities, negative. Average global commodity export prices increase by up to 6 percent, but the major impact generally comes from reductions in either or both exempt and non-exempt domestic support payments. The major exception to this is the dairy sector where trade reform contributes over 80 percent of the change in world export prices.

Table 4 Changes in Global Export Volumes: Simulation #3 (%)

Commodity	Total	Contributions of policy categories		
		Tariffs & export subsidies	Non-exempt domestic support	Exempt domestic support
Rice	9.06	9.5	-0.24	-0.2
Wheat	0.91	3.54	-1.18	-1.45
Other grain	-0.19	1.95	-1.25	-0.89
Oilseeds	3.65	2.43	-0.53	1.76
Other crops	3.89	4.42	-0.1	-0.42
Cattle	4.23	4.75	0.03	-0.55
Other livestock	4.83	5.26	-0.33	-0.11
Beef	5.59	5.99	-0.2	-0.21
Other processed food	8.61	8.71	-0.06	-0.03
Dairy	3.38	3.35	-0.09	0.12

Table 5 Changes in Global Export Prices: Simulation #3 (%)

Commodity	Total	Contributions of policy categories		
		Tariffs & export subsidies	Non-exempt domestic support	Exempt domestic support
Rice	1.03	0.54	0.4	0.09
Wheat	5.92	1.13	1.97	2.82
Other grain	6.13	0.68	2.72	2.73
Oilseeds	2.86	0.59	1.86	0.41
Other crops	-0.54	0.18	0.06	-0.78
Cattle	5.1	-0.26	1.32	4.04
Other livestock	1.06	-0.11	0.65	0.52
Beef	3.36	0.69	0.84	1.82
Other processed food	0.26	-0.15	0.21	0.21
Dairy	2.69	2.2	0.63	-0.14

Conclusions

Negotiating meaningful reductions in domestic support is one of the more contentious issues in the current WTO agricultural negotiations. The domestic support instruments used in some countries are linked to trade policy in the sense that reductions in tariffs may be accompanied by compensating increases in domestic support (re-instrumentation). The question therefore arises, if countries agree to reduce border protection, what would be their responses with respect to domestic support? Should the agricultural negotiations mandate specific reductions in domestic support, then that provides the answer. Because of the political and economic complexities of the negotiations on domestic support and the so-called non-trade issues such as multifunctionality, a final agreement could permit an increase in currently-exempt domestic support spending, but our results suggest that the impacts in terms of further distortions to world markets would not be great.

The decomposition of welfare gains by policy instrument clearly indicates that for many developed and developing countries by far the major contributor to national welfare gains from agricultural policy reforms is the reform of import and export trade

policies. This study therefore supports the view that market access and removal of export subsidies are central to the current round of trade negotiations. Should further restrictions on domestic support continue to be pursued in the current round, some negotiators may seek to trade these off against reforms to import and export policies. Tightening domestic support constraints (especially on blue- and green-box spending), quite apart from providing little gain to developing countries, could therefore have a negative impact on agricultural trade, whereas relaxing the constraints could be a way of "buying" more access to developed-country markets and finally achieving significant reductions to tariffs and the elimination of export subsidies. Once substantial progress has been made in the latter areas, negotiators can turn their attention to the less distorting domestic support policies (Josling, 2000).

Our analysis assumes that WTO members would agree to the tariff and export subsidy cuts modelled here. But if no limits were placed on domestic support in the negotiations, governments could be amenable to accepting deeper cuts in protection since they will be able, should they so choose, to maintain or even increase domestic support payments to their farmers as compensation. Further, more ambitious trade policy reforms than those modelled here could increase the compensation required to maintain farmers' incomes. This would increase the likelihood that some countries may not be prepared to fund domestic support payments to such an extent, hence generating reforms to domestic support even in the absence of an explicit agreement to do so. Such eventualities would strengthen our conclusions.

Crucial to our conclusions are the modelled responses to changes in the various domestic subsidies. Those observed in our results are a consequence of the interactions between the various components and parameters of the GTAP model. At the analytical level, the green/blue-box land and capital payments are modelled as input subsidies and linked to farm sectors in GTAP, rather than paid directly to, say, farm households, so the model retains a linkage between such largely decoupled payments and farm output. It is this contrived linkage that results in the observed responses, rather than the commonly suggested reasons for a coupling between such subsidies and output, for example through wealth effects or risk reduction. Further analytical and empirical work will enable us to better judge the trade-distortion effects of decoupled and quasi-decoupled policies, and to determine whether the GTAP-generated responses are reasonable. However, the assumptions embedded in our modelling are broadly comparable with some others reported in the literature.

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Endnotes

* Financial support from the New Zealand Foundation for Science, Research and Technology contract number IERX0001, and the C. Alma Baker Trust is gratefully acknowledged. We also acknowledge suggestions from participants at the 5th Annual Conference on Global Economic Analysis, Taiwan, 5-7 June 2002.

1. http://www.fas.usda.gov/itp/wto/proposal.htm
2. http://www.cairnsgroup.org/proposals/inex.html
3. http://europa.eu.int/comm/agriculture/index_en.htm
4. These countries argue that farming produces outputs in addition to food and fibre, such as environmental protection and enhancement and increased vitality of rural areas, and that domestic support payments are justified for the provision of such externalities (Anderson, 2000).
5. Production Flexibility Contract payments, crop and revenue insurance, marketing loans and disaster assistance.
6. We should also point out that, at least for the commodities and regions examined, land and capital comprise relatively small shares of total costs.
7. Individual commodities are weighted by base period prices.
8. The positive import elasticity for the EU reflects the relative lack of domestic support to the "other crops" sector and the flow of resources out of this sector towards those more heavily supported.
9. This elasticity for the United States is positive, due to increased net imports of "other crops" which domestically receive very little exempt support payments relative to the other U.S. farm sectors.
10. All scenarios that include reductions in tariffs and export subsidies may also implicitly include a degree of amber-box domestic support reduction as measured by the AMS, if it is assumed that market price support associated with administered price schemes would be permitted by governments to decline in tandem with tariff or export subsidy reductions.

11. In our aggregation, these are AUS, EU, NZL, CAN, US , JPN and EFTA (see table 1 in the technical annex for regional descriptions). Note that these reductions are from the applied tariffs, rather than the bound levels. This may result in overestimation of trade gains, should a WTO agreement specify reduction from bound tariffs.

The technical annex to this paper, pages 117-122, is available as a separate document.