

How Effective are WTO Disciplines on Domestic Support and Market Access for Agriculture?

David Blandford

The Pennsylvania State University, University Park, PA, U.S.A.

Ivar Gaasland

*Institute for Research in Economics and Business Administration,
Bergen, Norway*

Roberto Garcia

Norwegian University of Life Sciences, Ås, Norway

Erling Vårdal

University of Bergen, Norway

Abstract:

A new round of trade negotiations under the World Trade Organization (WTO) was launched in 2001. One of the major aims of the Doha Development Round is to reduce agricultural protection and impose greater discipline on domestic agricultural subsidies, particularly those that are the most trade distorting. In this paper we examine whether the proposed WTO modalities for agriculture will actually achieve this aim in Norway, which ranks among the top providers of government assistance for agriculture. Norway has a complex system of farm subsidies buttressed by substantial import protection. The extent to which its agricultural support policies will have to be changed in response to new WTO disciplines provides an important indication of how successful these are likely to be. We find that Norway will probably be able to sustain its current agricultural activity and production levels while staying within the new WTO rules. Following recent practice in some other WTO members, Norway will be able to reduce its notified support without making real changes in some of its programs. However, there will have to be a shift from market price support, which is paid for by consumers through higher food prices, to budgetary support paid by taxpayers and that could generate internal pressures for policy reform.

Keywords: WTO, Doha-round, domestic support, market access, partial equilibrium model

JEL-classification: C69, F53, Q17, Q18

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1. Introduction

A new round of trade negotiations under the World Trade Organization (WTO) was launched in 2001. One of the major aims of the Doha Development Round is to reduce agricultural protection and impose greater discipline on domestic agricultural subsidies, particularly those that are most trade distorting. In this paper we examine whether the proposed WTO modalities for agriculture will actually achieve this aim in the case of Norway. Norwegian agriculture, which accounts for less than one percent of GDP and three percent of domestic employment, is among the most heavily protected in the world (NILF 2007). The OECD's Producer Support Estimate (PSE) for Norway was 65 percent in 2006, surpassed only by Iceland's 66 percent (OECD 2007). Norway has a complex system of farm subsidies involving deficiency payments, structural income support, acreage and headage payments, and a range of indirect supports. The system is buttressed by substantial import protection, which limits market access. Consequently, the extent to which Norway will have to change its agricultural support policies in response to new WTO disciplines provides an important indicator of how successful these are likely to be.

2. Current and proposed WTO rules for agriculture

One of the major achievements of the Uruguay Round (UR) of negotiations (1986-1994) was an agreement on agriculture. Since the signing of the General Agreement on Tariffs and Trade in 1947, agriculture had largely been left out of multilateral trade negotiations. There had been little reduction in the protection provided through tariff and non-tariff trade barriers and support through domestic subsidies (Normile and Simone 2001).

The UR Agreement on Agriculture (AoA) made modest progress in this regard, resulting in the conversion of non-tariff barriers to bound tariffs with some moderate reductions. The AoA introduced limitations on the value of export subsidies and the volume of subsidized exports, and a cap on the value of the most trade-distorting domestic subsidies, again with a modest reduction in that cap. There were also several other innovations, including: a construct called tariff-rate quotas (TRQs) intended to provide a minimal level of market access for imports that would otherwise face prohibitive tariffs; the Aggregate Measure of Support (AMS) that defines how trade-distorting subsidies are to be measured and how the value of support is to be quantified; and the classification of two categories of subsidy (*blue box* and *green box*) that were to be monitored but not subject to reduction commitments. *Blue box* support includes potentially trade-distorting subsidies that also involve constraints on production, while *green box* support is a category of payments viewed to be minimally distorting for production and trade. The quantification of the total AMS includes all product-specific and non-product-specific support, except when this is below five percent of the corresponding value of production, a threshold defined as *de minimis* support. The total AMS plus the *de minimis* is referred to as amber box support.

Agriculture has continued to occupy a central position in the Doha negotiations. These focus on the three pillars of the UR AoA: domestic support, market access (tariffs and TRQs) and export competition (export subsidies). The AoA is 28 pages long. The summary of the draft modalities prepared by the chair of the WTO agricultural negotiating committee in December 2008 is over four times as long (123 pages). Although commitments in individual country schedules would have to be included in considering the respective lengths of the two agreements, the substantial increase in length of the body of the draft Doha agreement is indicative of the complexity of the new modalities.

Table 1: Summary of agricultural commitments for developed countries

1. Domestic Support ⁽¹⁾

- A. Overall Trade-Distorting Domestic Support (OTDS) ⁽²⁾ calculated on the basis of an average for 1995-2000, to be reduced according to the following:
 - 80 percent for base OTDS levels greater than US\$60 billion;
 - 70 percent for base OTDS levels between US\$10 and 60 billion; and
 - 55 percent for base OTDS levels less than US\$10 billion.
- B. Total AMS commitment to be reduced according to the following:
 - 70 percent for final bound UR AoA levels of greater than US\$40 billion;
 - 60 percent for levels between US\$ 15 and 40 billion; and
 - 45 percent for levels less than US\$ 15 billion.

Furthermore, developed country Members with high relative levels of final bound total AMS (i.e., at least 40 percent of the average total value of agricultural production during 1995-2000) that are in the bottom tier, (i.e., less than US\$ 15 billion) are required to make an additional reduction of one half of the difference between the reduction rates specified for the top two tiers (i.e., $\frac{1}{2}$ [60 – 45] or 7.5 percent).
- C. Product-specific AMS limits

AMS support on a product-specific basis will have a base rate calculated as the average for 1995-2000. In cases where a Member introduced product-specific AMS exceeding the *de minimis* level, but where the country did not have product-specific AMS support during the base period, the limit may be the average value for the two years prior to the adoption of the modalities. In cases where product-specific support for each year during the base period was below the *de minimus*, the base is the *de minimis* level.
- D. *De minimis*

The *de minimis* levels, either 5 percent of the total value of agricultural production for non-product-specific support or 5 percent of the total value of production of a basic agricultural product in the case of product-specific support, are to be reduced by no less than 50 percent.

E. Blue box

The value is capped at 2.5 percent of the average total value of agricultural production for 1995-2000. Countries with blue box support exceeding 40 percent of the OTDS have a reduction commitment equal to that for the AMS. Blue box support for individual products is limited to the average value during 1995-2000.

2. Market Access

A. Cuts in UR final bound tariffs according to the following:

50 percent for lines with *ad valorem* equivalents greater than 0 and less than or equal to 20 percent;

57 percent for lines with *ad valorem* equivalents greater than 20 percent and less than or equal to 50 percent;

64 percent for lines with *ad valorem* equivalents greater than 50 percent and less than or equal to 75 percent; and

70 percent for lines with *ad valorem* equivalents greater than 75 percent.

There is also a requirement that the minimum average cut across all final bound tariffs is 54 percent and a tariff ceiling of 100 percent.

B. Sensitive products

Of the 1,354 agricultural tariff lines, 4 percent can be designated as sensitive. An additional 2 percent can be designated sensitive by Members that have more than 30 percent of their tariff lines in the top band. There is a requirement for TRQ expansion for sensitive products, depending on the deviation from the applicable tiered reduction formula in the final bound tariff rates on products designated as sensitive. If tariffs on sensitive products exceed 100 percent *ad valorem* after the reduction, a higher quota expansion of 0.5 percent of domestic consumption is required on those lines.

C. Other issues: TRQs

In-quota tariffs are to be reduced either by 50 percent or to a threshold of 10 percent, whichever is lower. In cases where the TRQ was administered by the MFN bound rate, the Member can eliminate the tariff quota. There is to be stricter administration of TRQ fill rates. Members have the right to request that unused import licenses be reallocated to potential users in cases where the quota is not filled.

3. Export subsidies are to be eliminated.

⁽¹⁾ Special provisions apply to the calculation of product-specific blue box limits for the United States and there are some provisions for shifting product-specific support from the AMS to the blue box (see Blandford et al. 2008). These are not included in the table.

⁽²⁾ There is an additional reduction for developed countries with an OTDS exceeding 40% of the value of production.

Sources: WTO (2008b), for domestic support, see also Orden (2008)

Table 1 summarizes the main features of the Doha-round proposals. The proposed cuts in domestic support are substantial. The biggest users of domestic support (defined in terms of the value of the bound AMS in US dollars) have the largest reduction commitment. Norway's total bound AMS is less than US\$ 2 billion, placing it in the lowest tier of cuts in domestic support. However, the notified total AMS as a share of the value of agricultural production amounted to roughly 58 percent during 1995-2000, requiring a

further cut of 7.5 percent. A cap on blue box subsidies is also proposed. There is also a new support concept, the *overall trade-distorting support* (OTDS), defined as the sum of the total AMS, blue box, and product-specific and non-product specific *de minimis* support. The OTDS is capped and has a reduction commitment. The OTDS is intended to act as a constraint on policymakers' overall ability to support agriculture.

The main principles for the market access proposals are also summarized in Table 1. Under the draft modalities countries would be required to reduce their highest MFN bound tariffs (those exceeding 75 percent *ad valorem*) by 70 percent and reduce overall MFN rates by 54 percent. However, under the conditions for designating sensitive products, Norway would have the right to declare 81 product lines as sensitive. These would be subject to smaller tariff reductions, but would require a corresponding increase in any associated market access quota under a TRQ. Finally, the Doha draft modalities call for the phased elimination of export subsidies.

On the surface, the proposed changes seem dramatic for Norway. As we shall demonstrate, both the actual AMS and blue box support are currently high. In addition, border protection is extremely high (WTO 2001). The applied average tariff on all agricultural products under Chapter 2 of the harmonized system was 38 percent in 2004 (WTO 2004). However, 44 percent of the bound most-favored nation (MFN) tariffs are in the range of 100-400 percent.¹ In addition, Norway has the highest number of TRQs negotiated of any WTO member country, 232 out of a WTO total of 1,425. In-quota tariff rates also generally exceed 100 percent.

¹ See Appendix 3 for details.

Norway has WTO commitments on export subsidies for a range of agricultural products, primarily under the meat and dairy product lines, with the most important being the commitment on cheese. This is because of the absolute volume of subsidized exports involved and the near 100 percent fill rate for the allowable export quota during 1995-2004. In its most recent export subsidy notification to the WTO (2008a) covering 2005-2007, Norway indicated that it continued to use more than 90 percent of its volume commitment on subsidized cheese exports of 16,208 tons, and 80 percent, on average, of the commitment on the maximum value of export subsidies of 246 million Norwegian krone (NOK)².

² Norway's notifications to the WTO are reported in Norwegian krone (NOK). For readers who are unfamiliar with the value of the Norwegian currency, the approximate exchange rate against USD in February 2009 was 7.00. However, a more representative value of the USD in terms of NOK would be to take the average value over the last 25 years, which is approximately 7.50.

3. The WTO Modalities and Domestic Support in Norway

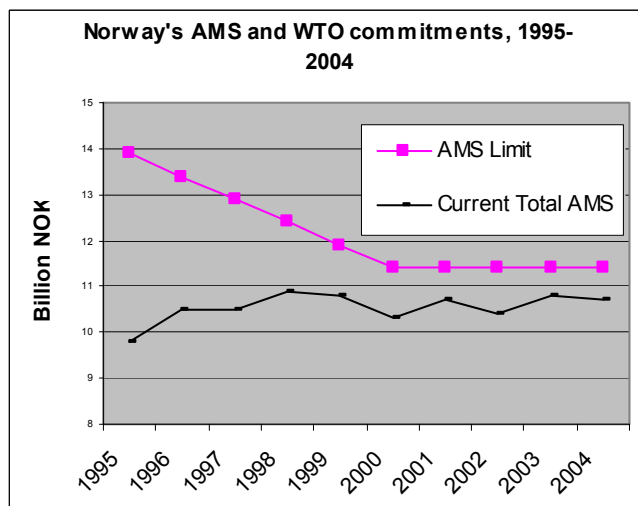
3.1 How Norway has adapted to the Uruguay Round

As a result of the Uruguay Round negotiations, Norway established a base (1986-1988 average) for its total AMS of NOK 14.3 billion. This was reduced by 20 percent to NOK 11.4 billion over the implementation period, 1995-2000.

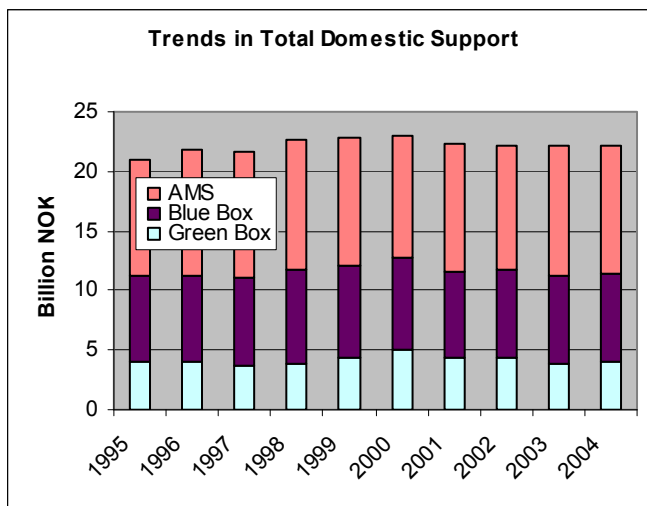
Norway's AMS is composed primarily of market price support, which is measured as the difference between domestic administrative prices and a fixed reference price, multiplied by eligible production. A binding reduction in the AMS would therefore translate into a reduction in administrative prices or eligible production or both.

Figure 1 (a) highlights developments in Norway's total AMS. The bound rate is the kinked line that declines from 1995-2000 with the annual reduction commitment under the Uruguay Round and then levels off at the new total AMS ceiling after 2000. The current annual AMS, represented by the lower line, is below the bound rate for the entire period but the gap has narrowed, particularly after 2000, suggesting that the bound rate has the potential to become binding. Current AMS data are presented through 2004 because that is the last year for which Norway has notified its domestic support to the WTO. In panel (b), the composition of the total support in terms of the various boxes is shown. Total support is the aggregate of green, blue and amber box measures for agriculture. Only the amber and blue box components would be subject to reduction commitments in a Doha Round agreement.

Figure 1: Domestic agricultural support in Norway. 1995-2004



Panel (a): AMS



Panel (b): Total domestic support

Green box support

Support that has no or minimal production and trade-distorting effects can, according to Annex 2 of the AoA, be placed in the green box category. This type of support must be provided through a publicly-funded government program not involving transfers from consumers, and cannot have the effect of providing price support to producers (Blandford and Josling 2007). There are no ceilings or reduction commitments on the value of support under the green box. The largest item notified by Norway under the category is the “vacation and replacement scheme”, which provides refunds for farm-related expenses when a farmer takes a vacation. This form of support is not explicitly mentioned in Annex 2, but it is quite substantial, accounting for roughly one third of Norway’s green

box total. Since, in reality, the scheme can have an effect equivalent to a farm labor subsidy, it could be argued that it stimulates production. In addition, payments made under the scheme are based either on the number of animals or the acreage in production, which appears to be inconsistent with the production-neutral requirement of green box support. Member countries could challenge Norway's inclusion of this program in the green box, requiring that it be notified under the AMS instead.

Another potentially controversial green box measure is the grain price-support program, which according to the government includes two items. The main item is a payment for stockholding for food security purposes, which is notified to the WTO under the "public stockholding for food security purposes" heading. The payment is given to processing industries that use Norwegian grain. It is paid on a per kilogram basis, and, in effect, reduces the price to domestic grain users. According to the WTO, an important criterion for payments under the "public stockholding for food security purposes" is:

"Expenditures (or revenue foregone) in relation to the accumulation and holding of stocks of products which form an integral part of a food security programme identified in national legislation. This may include government aid to private storage of products as part of such a programme.

. . . Food purchases by the government shall be made at current market prices and sales from food security stocks shall be made at no less than the current domestic market price for the product and quality in question"

(GATT 1994, p. 58).

The current Norwegian system does not satisfy this condition and its inclusion in the green box is also potentially subject to challenge.

Blue box support

Schemes classified under the blue box fall under three types: (1) payments based on fixed area and yields; (2) payments made on 85 percent or less of the base level of production; and (3) livestock payments made on a fixed number of head. As with green box programs there was no WTO commitment on the total value of blue box support in the AoA.

From Figure 1 (b) it may be seen that the share of the blue box support in total Norwegian support is large, amounting to some 25 percent. Together with the amber box (AMS), these two categories constitute roughly two-thirds of overall domestic support. Norway's most prominent blue box measure has been the "acreage and cultural landscape scheme", a fixed area support payment. But "headage support", a per unit livestock payment, is almost as high.³

3.2 The Doha round proposals for domestic support

Table 2 summarizes the proposed commitments for the reduction in Norwegian domestic support, based on the most current draft report on modalities for agriculture prepared by the chair of the WTO agriculture committee, Crawford Falconer (WTO 2008b), corresponding to the formula presented in Table 1. The OTDS value, NOK 21.2 billion, is the sum of the current AMS ceiling, the average blue box value during 1995-2000, and

³ Smaller measures are "regional deficiency payments" for milk and meat production. These are categorized as payments based on 85 percent or less of base level production.

the *de minimis* support, which is five percent of the value of agricultural production. Since Norway has a total AMS less than US\$ 15 billion, its AMS reduction commitment is 45 percent. However, countries such as Norway that have a high AMS as a share of total value of production face an additional 7.5 percent reduction. This 52.5 percent requirement means that Norway's total AMS binding has to be reduced from NOK 11.4 billion to NOK 5.4 billion. In addition, Norway currently has more than 40 percent of its trade distorting support under blue box measures, which requires the same reduction commitment as the total AMS. This would reduce the maximum value of blue box support from NOK 7.5 billion to NOK 3.6 billion. Norway would be required to reduce its OTDS by 55 percent, because the OTDS base is less than US\$10 billion, resulting in a commitment of NOK 9.5 billion.⁴

Table 2: Current rates of support and proposed commitments (billion NOK)

Domestic support	Current base rate	Proposed Doha commitment
AMS	11.4	5.4
Blue box	7.5	3.6
<i>De minimis</i> support	2.3	1.1
Overall trade distorting support (OTDS)	21.2	9.5

Source: Own calculations based on current draft modalities, WTO (2008b) and MAF (2009, p. 9)

Norway's current AMS is around NOK 10 billion. Blue box support has varied between NOK 7 and 8 billion in recent years, yielding an OTDS of roughly NOK 18

⁴ It is likely that the NOK 9.5 billion in OTDS under the proposed Doha commitment would act as the binding constraint on domestic support. The sum of the new AMS and blue box ceiling would be NOK 9.0 billion, which is below the OTDS ceiling, and Norway could use the remaining NOK 0.5 billion as non-product-specific *de minimis* support. Norway began using around NOK 0.1 billion in *de minimis* support after 2002 (WTO 2008c).

billion. Hence, if the proposed Doha Round commitments are agreed, the Norwegian agricultural sector seems to face substantial change since the OTDS would be capped at NOK 9.5 billion. However, there are reasons to believe that the impact of the Doha Round commitments would not be so dramatic. These are discussed in the following subsections.

3.3 Box shifting

If a country is likely to have problems meeting WTO commitments on trade-distorting support, it may try to redefine its policy measures so that these can be notified as green box. Norway has undertaken considerable preparation to justify such box shifting. The “acreage and cultural landscape scheme” is an example. In 2005 this scheme was included as an important element in the National Environmental Programme (MLSI 2004, MLSI 2005 and MAF 2005). For a farmer to be eligible for support an environmental plan must be followed and land must be managed in an environmentally friendly manner. The farmer receives a per hectare payment for compliance. There is additional support to help cover the cost of implementing certain types of production techniques, provided on an activity-specific basis. The national regulatory body, the Norwegian Agricultural Authority, has claimed that this support complies with green box criteria.⁵

In 2007, another change was introduced by the Norwegian Agricultural Authority whereby the support to grazing livestock, which earlier was considered part of “headage

⁵ This can be questioned because the green box compliance criteria state that such payments can only compensate for additional costs or income foregone through complying with an environmental program.

support” under the blue box, was included in the National Environmental Programme and was claimed to be green box (MAF 2006). Because the support was labeled as a component of an environmental program, it was re-classified even though the nature of the payment had not changed. Hence, NOK 3 billion of the NOK 7.5 billion blue box support has already been shifted into the green box, which should make it easier for Norwegian policymakers to meet a Doha cap of NOK 3.6 billion under the blue box.

3.4 Following the Japanese example

In 1997, Japan reduced its notified AMS substantially by changing its rice policy. Administered prices for rice were eliminated, although the government continued to acquire rice for food security stocks (Godo and Takahashi 2008). There was little real change in the Japanese rice market since domestic producers were protected by a TRQ with a prohibitive over-quota tariff. Many other WTO countries have since lowered their AMS support by abolishing or redefining the purpose of administered prices thereby removing market price support from the AMS calculation (Orden 2008).⁶

When Norway notified its support for 2002-2004, it changed the definition of some administered prices.⁷ This redefinition had the effect of lowering the market price

⁶ According to Brink (2008), other countries, notably Australia, EU, Mexico, South Africa, Switzerland and the USA have also adopted this strategy.

⁷ In the 2002-2004 domestic support notification (WTO 2008c), the administered milk price was measured at the farm gate level, while in earlier notifications it was measured at the dairy processing level. This counts for 1/3 of the discrepancy between the old and new way of notifying. In addition, changes were made in the formulae used for calculating the value of compensation for concentrated feed. This accounts for another 1/3 of the discrepancy.

support component in the total AMS. Without this redefinition, it is likely that Norway would have broken the AMS-ceiling (Mjørland and Vårdal 2008).

The Norwegian Ministry of Agriculture and Food has on several occasions announced that it will abolish certain domestic administered prices, as a means of reducing its current total AMS. From 1 January 2007, an equivalent reference price for poultry meat replaced the former administered price. In a proposition to the parliament (MAF 2005), it was argued that this would remove market price support for poultry meat from the AMS calculation and reduce total AMS support by NOK 800 million. In May 2008, in negotiations between the farmers' unions and the Ministry of Agriculture and Food, it was agreed to increase prices on most agricultural products, an action that would likely have violated the AMS ceiling. The problem was solved by replacing administered prices by reference prices for sows, boars and mutton, thereby removing these products from the AMS support calculation.

4. An Assessment of the Implications of the Doha Modalities for Norway

The reduction commitments under any of the three pillars in the Doha modalities could potentially affect Norwegian agricultural policies. For example, consider the effect of eliminating export subsidies for cheese. The inability to provide such subsidies would curtail cheese exports, which are a convenient avenue for removing surplus milk from the domestic market. Hence, the elimination of export subsidies seems to imply a cut in the price of milk in order to reduce production. This would reduce the market price support component in the AMS. Lower milk production could also reduce income support under blue box support programs.

Similarly, reductions in tariffs and increases in the market access quotas under TRQs across various product lines should lead to lower domestic prices through increased competition from imports. Therefore, increased market access should result in reductions in measured domestic support. A key issue is the extent to which the export competition and market access modalities would actually reduce measured support and, by extension, how much additional effort Norway might have to make to meet the Doha domestic support bindings summarized in Table 2.

4.1 The model

To examine these issues we use a price-endogenous model of Norwegian agriculture. The model includes the most important commodities produced by the Norwegian agricultural sector. For given input costs, demand functions and support systems, the model computes market clearing prices and quantities. The model includes all major agricultural policies and generates estimates of production, use of inputs, domestic consumption and prices, imports

and exports, measures of notified support, and economic surplus measured as the sum of producers' and consumers' surplus.⁸ Further details are provided in Appendix 1.

The base year in the model is 2003. Since the structure and size of agricultural production, as well as agricultural support, has been relatively stable over the last decade, this can be viewed as a representative year. The current AMS in the base year 2003 amounted to 93 percent of the ceiling set in the UR AoA.

4.2 Doha assumptions and implementation

The main features of the proposed modalities under the most recent draft agreement are summarized in Table 1. To consider the implications for Norway, the relevant modalities are considered and the assumptions used are given in Table 3. The final bound AMS as well as the average blue box support in the base period 1995-2000 has to be reduced by 52.5 percent, while the maximum OTDS is to be reduced by 55 percent. Compared to the levels in the base year, which differ from the base rates, AMS, blue box support and OTDS have to be reduced by 49, 51.4 and 48.6 percent, respectively.

With respect to market access, MFN tariffs for products in the top tier that are not defined as sensitive are subject to a 70 percent reduction, with a 100 percent ceiling. For the principle Norwegian products, the 100 percent ceiling will be binding. However, as is pointed out below, since all principle Norwegian products can be defined as sensitive, the 100 percent ceiling will not be relevant.

⁸ More details and further references can be found in Brunstad et al. (2005). The model is constructed to perform policy analysis and has been used by the Norwegian Ministries of Finance, and Agriculture and Food.

Table 3. Main assumptions in the model

1. Domestic Support

- A. OTDS: the base rate value of OTDS is reduced 55 percent.
- B. AMS: the UR bound rate is reduced by 52.5 percent (45 + 7.5 percent).
- C. Product-specific AMS: the *de minimis* level based on the average value of production of the basic agricultural product.
- D. *De minimis*: product-specific and non-product-specific *de minimis* are reduced by 50 percent.
- E. Blue box: reduced by 52.5 percent from the 1995-2000 base.

2. Market Access

- A. MFN bound tariff rates: average 70 percent reduction for the highest tariff lines and there is a 100 percent tariff ceiling for all non-sensitive goods.
- B. Sensitive products: the maximum number of tariff lines that qualify as sensitive products under agriculture is 6 percent (4 plus an extra 2 percent in cases where a Member has more than 30 percent of their tariff lines in the top tariff band) based on the total number of HS-6 tariffs lines under agriculture (WTO definition of agriculture).
- C. MFN tariffs for sensitive products: MFN bound rates reduced by 23.33 percent (a 2/3 deviation from the otherwise 70 percent reduction).
- D. TRQ expansion: the market access quota is 6.5 – 7 percent of domestic consumption (6 plus an extra 0.5 percent because all sensitive products have tariff rates exceeding 100 percent. For the additional 2 percent of sensitive products from B, TRQs are expanded by an extra 0.5 percent. This means that the TRQs are 6.5 percent of domestic consumption for the first 4 percent of the sensitive products, and 7 percent for the next 2 percent.)
- E. TRQ fill rate: a minimum fill rate of 65 percent to avoid being challenged by other WTO members.

3. Export subsidies are eliminated.

Sources: WTO (2008b); Gaasland, Garcia and Vårdal (2008)

Products defined as sensitive are subject to lower tariff reductions, but at the expense of creating new market access opportunities through TRQs, which are additional to the existing TRQs from the UR. We assume that Norway will choose to define 6 percent of the total number of products listed under the Harmonized Commodity Description and Coding System of the tariff nomenclature (HS) at the 6-digit level (HS-6) as sensitive. This means that all principle Norwegian products such as grain, meat and milk products, are covered as sensitive products (see Appendix 4).

The ordinary tariffs for sensitive products are subject to a 23.33 percent reduction in the MFN tariff rate (i.e. 2/3 deviation from the otherwise 70 percent reduction), which yields tariffs above 100 percent. Concessions in the form of new TRQs amount to 6.5 percent of domestic consumption, but with an additional 0.5 percent for the additional 2 percent of the product lines declared as sensitive products. The quota fill rate is set to 65 percent, below which challenges can be made by other WTO members. We assume that the authorities only hand out import quotas equal to this minimum fill rate. This will help promote price and market stability, which has been a hallmark of Norwegian agricultural policy. Finally, export subsidies are abolished. The details behind these calculations are shown in Appendix 4.

4.3 Results

The first column in Table 4 shows that domestic support in the base year 2003 was far above the new ceilings generated by the reduction commitments in Table 3. The current AMS exceeds the new ceilings by 96 percent, blue support by 109 percent, and the OTDS by 90 percent. The first strategy to minimize the impact on agricultural activity, which Norway already has followed, is to transfer subsidies from blue to green categories. In 2005, two years after the base year of our analysis, roughly NOK 3 billion previously included in the “acreage and cultural landscape scheme” under the blue box was shifted to the green box without any major change in how the policy was implemented. The second column in Table 4 reflects this move. While production value and economic

welfare are unchanged, blue box support and the OTDS decrease substantially, with blue box support now only 26 percent above the ceiling.

The next question is whether compliance with market access reduction commitments and the elimination of the export subsidy, as reported in Table 3, will be sufficient to bring support levels below the ceilings. The effects of eliminating export subsidies are shown in column 3 of Table 4. The present practice of subsidizing exports of cheese by levies on domestic sales of liquid milk is abolished. The implication is lower milk production which is accomplished by a cut in the farm gate price of milk. Since that price, interpreted as an administered price, enters into the market price support component of the total AMS, it and the OTDS are reduced (12 percent and 9 percent, respectively). Lower milk production and farm gate prices lead to a 6 percent decline in the total value of agricultural production. However, the 5 percent increase in economic welfare is indicative of the economic cost of the current policy regime.

If we now implement the market access commitments specified in Table 3, we generate the results in the fourth column of Table 4. While blue box support is close to the ceiling, the total AMS and the OTDS still exceed commitments by 23-39 percent. In other words, even if Norway complies with the market access and export subsidy commitments, the total AMS and the OTDS will still be too high. Also, observe that the production value in agriculture is now 25 percent below the present level which suggests that further cut in AMS and OTDS to comply with the commitments would have a major impact on Norwegian agriculture.

Table 4. Modeling results of WTO compliance with proposed Doha commitments

	Base solution (1)	Box shifting (2)	+ Export subsidy commitment (3)	+ Market access commitment (4)	+ Elimination of administered prices (Doha solution) (5)
<i>(Commitment = 100)</i>					
AMS	196	196	172	139	73
Blue box	209	126	126	109	88
OTDS	190	163	148	123	74
<i>(Base solution = 100)</i>					
Production value	100	100	94	75	92
Economic welfare	100	100	105	127	109

To minimize the effects, an obvious strategy would be to abolish the administered prices, which, as explained in section 3.4, will remove market price support as defined by the UR AoA from the AMS calculation.⁹ Since 98 percent of Norway's AMS is market price support, this provides substantial flexibility to compensate with deficiency payments within the NOK 5.4 billion AMS ceiling specified in Table 2. The results in column 5 show that it is possible to maintain more than 90 percent of the production value while meeting WTO commitments with safe margins.

We can conclude that even through the proposed Doha commitments seem to allow Norway to maintain most of its current agricultural activity level, the framing of agricultural policy will have to change. The present system of domestic market regulation

⁹ The *de minimis* quantities in the OTDS would allow Norway a limited amount of additional flexibility if it were to adjust its support levels. For example, Norway could use non-product-specific support amounting to 1.1 billion NOK providing that total trade-distorting support does not exceed the limit on the OTDS. However, given the amount by which the AMS and the blue box exceed their respective bindings in column 4 of Table 4, the support provided under those categories would have to be reduced substantially before this would become a viable option.

will be put under pressure when administered prices and export subsidies are eliminated and import options increase. Furthermore, cuts in import tariffs and higher TRQs imply lower farm gate prices, and, consequently, lower market price support. It follows that relatively more of the support has to be provided by taxpayers. Table 5 shows that budgetary support increases, in absolute terms, by nearly NOK 3 billion, while market price support is more than halved. As a result total support is only NOK 2 billion below the base year level.

Table 5: Composition of support (billion NOK)

	Base solution	Doha solution
Budget support	10.7	13.9
Market price support (actual)	9.8	4.5
Total support	20.5	18.4

6. Conclusions

A major achievement of the Uruguay Round was to include agriculture in the WTO system of multilateral trade rules. However, the agreement has had only a modest effect on Norway's agricultural production and trade. The agreed constraint on amber box support has not affected Norwegian agricultural programs. Norway has, in fact, managed to expand agricultural output relative to the 1986-1988 base period, and the current total AMS and total support have remained stable during 1995-2004. The most that can be concluded is that there has been some reduction in the “water” in the inflated binding on the total AMS.

The question raised in this paper is whether a positive outcome in the on-going Doha Round will require real policy change. At first sight, the Doha draft modalities appear to be a considerable advance on the weak disciplines in the UR AoA. Norway's current AMS, blue box and OTDS exceed the proposed Doha ceilings by 90 – 110 percent, and either elimination of export subsidies or the required increase in market access are sufficient to bring support levels below the ceilings.

However, it is likely that Norway, like many other countries, will try to reduce the current AMS and blue box support in ways that involve no major change in policy. First, Norway has already shifted roughly NOK 3 billion from blue box to green box with only modest changes in the requirements for receiving such support. Second, the market price component of AMS is being reduced for some products by simply changing the way administered prices are calculated or replacing these with reference prices, which are not covered in the AoA. This provides substantial flexibility to compensate producers through deficiency payments within the AMS ceiling.

By using such approaches our empirical analysis suggests that Norway will be able to maintain most of the current activity in agriculture. However, the framing of agricultural policy will have to change. The present system of domestic market regulation will be put under pressure when export subsidies are eliminated and market access improves. Most important, cuts in import tariffs and expanded TRQ volumes imply lower farm gate prices, and, consequently, lower market price support. Relatively more of the support will have to be provided by taxpayers, and to sustain current agricultural activity budgetary support will have to increase substantially compared to the current level. Such a shift in the use of policy instruments involves serious challenges for Norwegian policymakers since budget support is more transparent than market price support and hence exposed to public scrutiny. Norway's policies may also be more exposed internationally if WTO-member countries begin to look more closely at Norwegian notifications and question whether its "green-box" support programs actually meet WTO rules. For example, the AMS-limit will be exceeded if Norway is forced to notify the "acreage and cultural landscape scheme" and "headage support" as AMS-support.

In conclusion, on the basis of our analysis it is difficult to envisage that any fundamental reform in Norwegian agricultural policy will result from the implementation of the Doha Round modalities as currently drafted. Unless Norway decides to implement reform unilaterally, pressure for any real policy change through WTO disciplines will have to wait for a future round of trade talks.

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Appendix 1: Short description of the agricultural model for Norway¹⁰

Domestic supply is represented by about 400 “model farm” types. Each model farm is characterized by Leontief technology, having fixed input and output coefficients. Although inputs cannot substitute for each other at the farm level, there are substitution possibilities at the sector level. For example, beef can be produced with different technologies (under different model farm types), under either extensive or intensive production systems, and in combination with milk. Thus, in line with the general Leontief model in which each good may have more than one activity that can produce it, the isoquant for each product is piecewise linear. Also, production can take place on either small farms or larger more productive farms. Consequently, there is an element of economies of scale in the model.

The country is divided into nine regions, each with limited supply of different grades of land. This introduces an element of diseconomies of scale because, *ceteris paribus*, production will first take place in the best regions. Domestic demand for final products is represented by linear demand functions. The economic surplus (i.e., consumer plus producer surplus) of the agricultural sector is maximized, subject to demand and supply relationships, policy instruments and imposed restrictions. The solution to the model is the set of prices and quantities that result in an equilibrium in each market.

¹⁰ More details and further references can be found in Mittenzwei and Gaasland (2008).

Appendix 2: Model results

	Base solution	Export subsidy commitment	Market access commitment	Elimination of administered prices (Doha solution)
Production (mill kg)				
Milk	1517	1383	1333	1400
Beef and veal	81	82	63	84
Sheep	23	23	24	23
Pig meat	110	111	78	110
Poultry	50	51	48	53
Eggs	53	53	50	53
Food grains	346	336	164	226
Coarse grains	893	883	708	890
Potatoes	289	290	290	289
Production value (billion NOK)	27.9	26.2	21.0	25.6
Land (mill haa)	0.92	0.91	0.74	0.88
Labor (1000 man-years)	53.5	52.4	45.1	52.1
Support (billion NOK)	20.5	19.0	15.6	18.4
Budget support	10.7	10.8	9.3	13.9
Amber	0.3	0.3	0.3	5.0
Blue	7.8	4.7	4.0	3.3
Green	2.6	5.7	4.9	5.6
Market price support	9.8	8.3	6.3	4.5
%PSE	0.73	0.73	0.75	0.72
WTO				
Blue	7.8	4.7	4.0	3.3
AMS	13.4	11.8	9.6	5.0
Subsidies	0.3	0.3	0.3	5.0
Market price support (ref.prices)	13.1	11.4	9.2	0.0
OTDS	21.2	16.5	13.6	8.3
Economic surplus (billion NOK)	20.1	21.1	25.6	22.0

Appendix 3: Degree of protection – base solution

Product	Domestic price	World market price	Price deviation	Price deviation	Tariff (MFN)	Water under the tariff
Rye	3.09	0.73	2.36	323 %	347 %	7 %
Minced meat	69.37	17.00	52.37	308 %	344 %	10 %
Rapeseed	7.78	2.17	5.61	259 %	268 %	4 %
Beef: steak, filet.	98.42	27.00	71.42	265 %	343 %	23 %
Peas	4.95	1.54	3.41	221 %	214 %	-3 %
Other meat	69.10	20.00	49.10	246 %	344 %	29 %
Wheat	3.09	0.95	2.14	225 %	347 %	35 %
Other grain	3.09	0.95	2.14	225 %	347 %	35 %
Cooked meats	131.08	40.00	91.08	228 %	363 %	37 %
Poultry	30.66	9.00	21.66	241 %	425 %	43 %
Pig meat: steak, filet	77.96	25.00	52.96	212 %	363 %	42 %
Sausages	53.88	18.00	35.88	199 %	344 %	42 %
Production of meat	45.13	15.00	30.13	201 %	363 %	45 %
Oats	2.05	0.80	1.25	156 %	233 %	33 %
Smoked sausage	142.53	51.00	91.53	179 %	344 %	48 %
Barley	2.05	0.76	1.29	170 %	318 %	47 %
Sheep meat: steak, filet	130.23	45.00	85.23	189 %	429 %	56 %
Flour	6.14	2.25	3.89	173 %	371 %	53 %
Apples	16.55	7.89	8.66	110 %	171 %	36 %
Flowers	5.73	2.50	3.23	129 %	249 %	48 %
Beef: carcass	32.36	13.00	19.36	149 %	344 %	57 %
Cheese, semi-soft (industrial use)	39.40	18.00	21.40	119 %	277 %	57 %
Butter	30.37	13.00	17.37	134 %	343 %	61 %
Pig meat: carcasses	26.72	12.00	14.72	123 %	363 %	66 %
Vegetables, greenhouse	12.86	8.27	4.59	56 %	134 %	59 %
Fluid milk, sweet	14.29	8.00	6.29	79 %	223 %	65 %
Vegetables, outdoors	7.22	4.82	2.40	50 %	126 %	60 %
Concentrated feed	3.14	1.50	1.64	109 %	347 %	68 %
Cheese, semi-soft (consumption)	56.87	30.00	26.87	90 %	277 %	68 %
Cured ham	135.06	65.00	70.06	108 %	363 %	70 %
Fluid milk (domestic consumption)	7.68	3.60	4.08	113 %	388 %	71 %
Cream	31.68	14.00	17.68	126 %	439 %	71 %
Pig meat: cuts, fresh	35.70	18.00	17.70	98 %	363 %	73 %
Potatoes	3.80	2.56	1.24	48 %	191 %	75 %
Beef: salted, smoked, marinated	83.17	45.00	38.17	85 %	344 %	75 %
Cheese, goat	50.97	34.00	16.97	50 %	233 %	79 %
Yoghurt	20.13	12.00	8.13	68 %	319 %	79 %
Beef: cuts, fresh	38.33	22.00	16.33	74 %	344 %	78 %
Cheese, whey	48.36	34.00	14.36	42 %	233 %	82 %
Eggs	14.84	10.00	4.84	48 %	272 %	82 %
Sheep meat: cuts, fresh	55.80	31.00	24.80	80 %	429 %	81 %
Fluid milk (domestic industry)	3.27	2.00	1.27	64 %	388 %	84 %
Sheep meat: salted, smoked, marinated	78.08	45.97	32.11	70 %	429 %	84 %
Other fruit	16.82	24.89	-8.07	-32 %	83 %	139 %
Cheese, soft	47.27	45.00	2.27	5 %	233 %	98 %
Sheep meat: carcasses	28.92	20.00	8.92	45 %	429 %	90 %
Pig meat: salted, smoked, marinated	41.91	35.55	6.36	18 %	363 %	95 %
Milk powder	16.79	14.00	2.79	20 %	392 %	95 %

Appendix 4: Tariff rate quotas and tariffs for Norway resulting from the proposed Doha commitments – data

Product classification in the model	HS-code	No. of tariff lines	Sensitive*) (=1)	Sensitive**) (=1)	TRQ from UR (mill.kg)	Tariff (MFN)	Prod. (mill.kg)	Net imp. (mill.kg)	Cons. (mill.kg)	New TRQS (mill.kg)	New tariff (MFN)
Wheat	10.01.10, 10.01.90	2	1		252	347 %	318	112	430	267.36	266 %
Rye	10.02.00	1	1		37	347 %	22		22	37.77	266 %
Barley	10.03.00	1	1		59	318 %	610	150	760	91.09	244 %
Oats	10.04.00	1	1		1	233 %	278		278	12.75	179 %
Other grains	(incl. Wheat) 11.01.00, 11.02.10, 10.02.20, 11.02.90, 11.03.11, 11.03.13, 11.03.19, 11.03.20		1			347 %	6		6	0.26	266 %
Flour		8		1		371 %	336		336	15.27	284 %
Concentrated feed	23.09.90	1		1		347 %	1593		1593	72.50	266 %
Rapeseed		1	1		8	268 %	10	0	10	8.44	205 %
Peas		1	1			214 %	1	1	2	0.09	164 %
Potatoes		1	1		0.499	191 %	289		289	12.70	146 %
Fluid milk (domestic consumption)			1		0.013	388 %	41		41	1.74	297 %
Fluid milk (domestic industry)	04.01.10, 04.01.20, 04.01.30,	5	1			388 %	11		11	0.44	297 %
Fluid milk, sweet	04.03.10, 04.03.90		1			223 %	4		4	0.15	171 %
Yoghurt			1			319 %	40		40	1.69	245 %
Cheese, semi-soft (consumption)				1		277 %	41	3	43	1.97	212 %
Cheese, semi-soft (industrial use)	04.06.10, 04.06.20, 04.06.30,	5		1		277 %	11		11	0.48	212 %
Cheese, soft	04.06.40, 04.06.90			1		233 %	4		4	0.16	179 %
Cheese, whey				1	0.221	233 %	10		10	0.69	179 %
Cheese, goat				1		233 %	2		2	0.09	179 %
Milk powder	04.02.10, 04.02.21, 04.02.29, 04.02.91, 04.02.99	5		1	0.241	392 %	24		24	1.31	301 %
Cream	(incl. fluid milk)			1		439 %	44		44	2.02	337 %
Butter	04.05.10, 04.05.20, 04.05.90	3	1		0.575	343 %	15	2	16	1.26	263 %

Appendix 4 continued

Product classification in the model	HS-code	No. of tariff lines	Sensitive* (=1)	Sensitive** (=1)	TRQ from UR (tons)	Tariff (MFN)	Prod. (mill.kg)	Net imp. (mill.kg)	Cons. (mill.kg)	New TRQ (mill.kg)	New tariff (MFN)
Beef: carcasses	02.01.10, 02.01.20,		1		1.084	344 %	81	1	82	4.56	264 %
Beef: cuts, fresh	02.01.30,		1		0.034	344 %	3	1	3	0.17	264 %
Beef: fresh, steak, filet	02.02.10, 02.02.20,	8	1			343 %	12		12	0.51	263 %
Beef: salted, smoked, marinated	02.02.30, 02.10.20, 16.02.50		1			344 %	0		0	0.02	264 %
Pig meat: carcasses	02.03.11, 02.03.12,		1		1.381	363 %	109		109	6.00	278 %
Pig meat: cuts, fresh	02.03.19,		1			363 %	43		43	1.82	278 %
Pig meat: steak, filet	02.03.21, 02.03.22, 02.03.29,	9	1		0.983	363 %	3		3	1.12	278 %
Pig meat: salted, smoked, marinated	02.10.11, 02.10.12, 02.10.19		1			363 %	0		0	0.01	278 %
Sheep meat: carcasses	02.04.10, 02.04.21,		1		0.206	429 %	23		23	1.17	329 %
Sheep meat: cuts, fresh	02.04.22,		1			429 %	9		9	0.40	329 %
Sheep meat: steak, filet	02.04.23, 02.04.30, 02.04.41,	8	1			429 %	0		0	0.00	329 %
Sheep meat: salted, smoked, marinated	02.04.42, 02.04.43		1			429 %	1		1	0.06	329 %
Poultry	02.07.11, 02.07.12, 02.07.13, 02.07.14, 16.02.32	5	1		0.366	425 %	47	3	50	2.49	326 %
Other meat, processed	(incl. beef, pig or sheep, 16.02.90)	1	1			344 %	24		24	0.99	264 %
Production meat	(incl. Beef, Pig or Sheep)		1			363 %	112		112	4.74	278 %
Minced meat	(incl. beef, pig or sheep)		1			344 %	33		33	1.38	264 %
Sausages	16.01.00	1	1		0.134	344 %	57		57	2.53	264 %
Cooked meats	(incl. beef, pig or sheep)		1			363 %	23		23	0.96	278 %
Smoked sausage	(incl. 16.01.00)		1			344 %	3		3	0.14	264 %
Cured ham	16.02.41, 16.02.42	2	1			363 %	4		4	0.18	278 %
Eggs	04.07.00	1	1		1.295	272 %	53		53	3.54	209 %
Sum	no. of sensitive lines	70	51	19							
	share of sensitive lines	(0.052)	(0.038)	(0.014)							

*) 4% of WTO tariff lines; 6.5 percent increase in TRQ **) 2% of WTO tariff lines; 7 percent increase in TRQ