FAO TRADE POLICY BRIEFS
on issues related to the WTO negotiations on agriculture

No. 1. COTTON: impact of support policies on developing countries - why do the numbers vary?

SUMMARY

- *Subsidies maintain cotton production at otherwise unprofitable levels in industrialized countries*
- *Excess supply induced by domestic subsidies has a depressing effect on the world market price*
- *Subsidy reductions will reduce poverty in developing producing countries*
- *Estimates of the magnitude of the impact of subsidies on the global pattern of cotton production, world market prices and cotton trade vary due to the range of assumptions used by different studies*

This brief [1] compares a number of analytical studies on the impact of developed country cotton support on developing countries, with the objective of determining the policy question that they seek to address, the extent of agreement on the impacts, and most importantly, the reasons that estimates of these impacts vary across the studies.[2]

What is the policy question being addressed?

The focus of most of the recent studies on cotton has been to estimate the impact of the Organization for Economic Cooperation and Development (OECD) cotton support on non-subsidizing cotton-producing countries.

Measuring the impact of domestic subsidy payments to cotton producers has become a central issue in the current World Trade Organization (WTO) negotiations. Brazil, for example, initiated a legal process at WTO by claiming that cotton subsidies in the United States were not consistent with WTO regulations. Also, four African cotton-producing countries at the Fifth WTO Ministerial Conference in Cancún, Mexico submitted requests for the elimination of, and compensation for prejudice caused by, all domestic subsidies to the cotton sector in industrial countries.

Quantitative measures of how domestic subsidies have affected the world cotton market and the prejudice they have caused to the trade interest of other producing countries have been used to underpin these submissions. These measures are based on models that estimate first the reduction in cotton production in subsidizing countries when these subsidies are removed and then the impact on world prices as a result of reduced exports (or increased imports) by these countries. These world price changes are then used to determine potential benefits to developing countries, through both the opportunity to produce more cotton and the higher price received for their production.

2 What are the impacts?

SUBSIDIES MAINTAIN COTTON PRODUCTION AT OTHERWISE UNPROFITABLE LEVELS IN INDUSTRIALIZED COUNTRIES, REDUCING THE OPPORTUNITIES FOR DEVELOPING COUNTRIES TO EXPORT TO SUBSIDIZING COUNTRY MARKETS AND DISPLACING THEIR EXPORTS TO THIRD COUNTRIES.

All of the recent studies unambiguously demonstrate that the removal of domestic subsidies in industrialized countries reduces cotton production in and exports from these countries. Current levels of EU production could be imported at one-third of the cost of production. In the United States, the cost of subsidies in some years is greater than the total value of exports at world prices. In 2003, more than 70 percent of US production was exported, accounting for 40 percent of world exports.

[1] Preparation of this brief was assisted by an informal consultation of experts involved in quantitative analyses on cotton held from 31 May to 1 June 2004 at FAO in Rome.

[2] A technical background paper provides a more detailed review of the existing studies, an explanation of the reasons for their divergent findings, and suggestions for continued research.

SUBSIDIES DEPRESS WORLD COTTON PRICES

The increased excess supply induced by domestic subsidies has a depressing effect on the world market price. However, there is significant divergence in the magnitude of this impact, with studies estimating increases of between 2 percent and 35 percent as a result of the removal of subsidies

The distribution of gains and losses across countries is measured primarily in terms of reductions in export earnings or increased import bills.

Identifying who gains and who loses, and by how much, is problematic but critical. For net exporters, a key difficulty lies in determining in which countries production is likely to expand as a result of increases in world market prices. Developing countries have been increasing their production and their share of world exports in spite of suppressed world prices and at a time when the opposite has been true for other commodity exports. This suggests that there is the potential for a significant supply response, should prices rise.

SUBSIDY REDUCTIONS REDUCE POVERTY

Two recent studies (Minot and Daniels, 2002; Poulton, 2004) investigate the poverty impact of declines in the cotton price facing smallholders in Benin and Zimbabwe. In Benin, a 40 percent fall in the price is estimated to result in an 8 percent increase in rural households in poverty and a 22 percent increase in cotton-producing households falling below the poverty line. In Zimbabwe, real incomes of cotton producers fall by between 13 and 31 percent, depending on the household characteristics, with poverty increases according to how dependent the households are on cotton income.

Table 1: Estimated impacts of developed country subsidy removal on world prices, EU and US production levels, and the resulting increase in West and Central African (WCA) export earnings

	Estimated price without subsidies (US$/lb)	Effect on price (% increase)	Production fall in the United States (%)	Production fall in the European Union (%)	Increase in WCA export earnings (US$ million)[5]
ODI (2004)[1]					
S/U	0.675	18 - 28	15.2	26.6	266.5
F/U	0.688	20	8.3	19.8	93.8
S/D	0.70	22	13.6	25.2	354.6
F/D	0.732	28	1.5	8.9	133.5
Goreux (2003)	0.589 - 0.649	2.9 - 13.4	2.2 – 14.7	10 - 48	37 - 254
ICAC (2002)	0.742	29.7	-	-	274
ICAC (2003)[2]					
2000/01	0.742	21	-	-	-
2001/02	0.738	72.4[4]	-	-	504
FAO (2004)	0.591 - 0.60	2.3.- 5.0	7.4 – 14.2	16.1 – 31.7	30
FAPRI (2002)	-	11.4	6.7	70.5	90.37
Reeves *et al* (2001)[2]	0.474	10.7	15.9	na	76
Sumner[3] (2003)	0.644	12.6	29.1	na	116
Tokarick (2003)	0.588	2.8	8.6	na	26

Source: Based on Shui (2004)

[1] The ODI studies run four model scenarios: S=Single Market; F=Fragmented market; U = Uniform elasticity; D = Differentiated elasticity. For the segmented market assumption, the world price is an average across segments.

[2] All studies use 2000/01 as the simulation year data except ICAC (2003) and Reeves (2001) which use 2001/02 data. Actual world price in 2000/01 = US$0.572/lb Actual world price in 2001/02 = US$0.418/lb.

[3] Removal of US support only

[4] The value of 72 percent reported in ICAC is considered by many to be an outlier due to the very low world price during the simulation year – see discussion on base year below.

[5] Where the prejudice to WCA farmers is not explicitly stated in a study, the value in the table is estimated by using a cotton supply equation for WCA to determine additional export earnings generated by the increase in world price.

What are the reasons for the differences in estimated impacts?

THE CHOICE OF ELASTICITIES

To estimate the impact of a policy change, analysts need to make assumptions as to the degree to which both production levels and quantities demanded change in response to a price change. Elasticities denote the proportionate change in production that is associated with a proportionate change in price. For example, a supply elasticity of 0.5 means that a 10 percent increase in the price of cotton will induce a 5 percent increase in the level of its production.

Different elasticities have been used in each of the studies reviewed. In most studies, demand elasticities, which in the models will determine by how much the world price will increase when the quantity of cotton entering the world market falls, are assumed to be small, ranging from the highly inelastic (ODI, Goreux, ICAC) to the less inelastic (FAO and Tokarick).[33]The assumption of a highly inelastic demand for cotton (i.e. a low value of the elasticity) results in significantly higher estimates of the rise in the world price for cotton when volumes of cotton entering the world market fall. Increasing the value of the elasticity leads to a lower estimate of the world price increase.

Most studies also assume low supply elasticity, i.e. that countries are limited in their ability to respond to rising prices by producing more. In addition to influencing the extent to which subsidizing countries as a group lose, and non-subsidizing countries gain, the choice of supply elasticities will determine the distribution of gains and losses across these countries, if different elasticities are assumed for different countries. With the exception of the Overseas Development Institute (ODI) (2004), all studies assume the same elasticity figures for all cotton-producing countries. Clearly, in reality, some countries are better able to respond to rising prices than others, and differentiating between them would appear appropriate. There is a clear danger, however, in that in assuming different values of elasticities in the absence of substantive empirical evidence, analysts are essentially "picking the winners" of cotton reform. In using differential elasticities, it is therefore critical that they be empirically-based.

DECOUPLED PAYMENTS

In addition to assuming that all non-subsidizing countries react to the same extent, most studies implicitly assume that subsidy reduction has the same effect in subsidizing countries irrespective of the existing support mechanism. The studies model subsidy reduction as a reduction in the price that the producer in the subsidizing country receives (i.e. the removal of support). This assumes that the producer does not receive support through other mechanisms (reallocation of support), as they would through the implementation of decoupled support. However, evidence suggests that the impact of decoupling payments from production is likely to be less significant than removing support altogether. Indeed, less than full decoupling (e.g. the 65 percent figure agreed in the recent EU cotton reform) could have a marginal impact on production, but after a threshold is hit (as it may be under full decoupling), cotton production could fall off sharply. Thus, for example, using an elasticity of 0.5 in this context could overestimate production reductions for marginal price changes, but underestimate the reduction if prices fall significantly.

COTTON REFORM AS PART OF A WIDER REFORM PACKAGE

Equally, a policy change directed solely at the cotton sector will have a greater effect than if a package of policies are implemented that reduce support to other crops as well. In estimating the impact of subsidy removal, it has generally been assumed that support to alternative crops/activities remains unchanged. The reality is often different, however. For example, support to the alternative crops in the EU will also be decoupled. The reduction in cotton production would be lower than that estimated in the models.

COTTON QUALITY AND MARKET STRUCTURE

Most studies do not distinguish between the quality or country of origin of cotton, and assume a single unsegmented market. If the quality of cotton is roughly the same, then models assuming a single market are satisfactory. However, if the quality or source is important, then a segmented market assumption may be more appropriate because a production decline in a certain subsidizing country or region may be of benefit only to countries producing a given type/quality of cotton. On balance, it is perceived that although there may be some constraints to spinners in switching between different sources of cotton in the short term, an assumption of a single, unsegmented market is appropriate in the medium-term comparative statistics analyses reviewed.

[3] Highly inelastic means that even if prices increase significantly, the demand for cotton will fall only marginally; for example, a 10 percent increase in price may result in only a 1 percent reduction in demand. A reduction in demand of 8 percent, for instance, would imply a less inelastic response, which might be used if it is assumed that there is relatively easy substitution between cotton and man-made fibres in textile production.

CHINA'S INCLUSION IN OR EXCLUSION FROM THE STUDIES

Given its dominance in production and consumption, but not currently in trade, changes in China (at the policy or market level) are key. China accounts for about one-third of output and consumption, and there will be a potentially significant impact if it reduces subsidies to its producers. However, there is some dispute as to whether China is currently subsidizing. If it is not, it will increase production following a price increase. The difficulty is that the level of subsidy payment is unknown.

THE USE OF DIFFERENT DATA SETS

Another potential source of discrepancies between studies results from their use of different data sets. There are both definitional and value differences between commonly used data from FAO, the International Cotton Advisory Committee (ICAC), the United States Department of Agriculture (USDA) and the UN Commodity Trade Statistics Database (COMTRADE).

Conclusions

All the studies reviewed here show that cotton subsidies have an impact on the global pattern of cotton production, world market prices and cotton trade. The studies also provide a useful indication of winners and losers if cotton subsidies are reduced or eliminated, but are very sensitive to the range of assumptions used in their estimations. This brief has reviewed the assumptions that are likely to be the most significant and that require more research to reduce discrepancies between the different predictions to improve the strength of the results.

A longer technical version of this brief includes recommendations for further research and is available at:

www.fao.org/trade/index_en.asp.

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