

OTDS REDUCTIONS IN THE GTAP DATABASE/MODEL: What can be done and how?

Seminar of the DFG Research Group
Hohenheim, January 21, 2010

Modeling domestic support - problems

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- **Modeling domestic support is at least as complicated as modeling market access barriers or export subsidies**
 - Differences in domestic support programs, which can vary widely from one country to another
 - Changes in agricultural policies e.g., Mid-Term Review of the EU CAP
- **GTAP is not well-suited to analyze domestic support issues**
 - Domestic support is incorporated in the GTAP model in form of price wedges, taken from the OECD PSE database
 - No distinction between the different WTO boxes
 - Market price support is only implicitly represented via border protection
 - Difficult to model the reduction in OTDS, which comprises final bound AMS, *de minimis* payments and blue box payments
 - Specific restrictions on domestic support make it even more complicated
- **How can domestic support issues be implemented in the GTAP model?**

Outline

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- Introduction
- Overview domestic support in the WTO negotiations
- GTAP framework and extensions
 - The GTAP database and domestic support
 - The GTAP model
 - Limitations
- Illustrative scenarios
 - Baseline 2020
 - Doha scenario 2020
 - The AMS calculation module
- Concluding remarks

Domestic support definition

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- Besides market access and export subsidies, domestic support is one of the three pillars of the WTO negotiations targeted for reduction
- Domestic support refers to the annual level of support, expressed in monetary terms, provided to agricultural production
- Domestic support includes:
 - Market price support
 - Output subsidies
 - Input subsidies
 - Farm based payments
 - Other minimally distorting payments

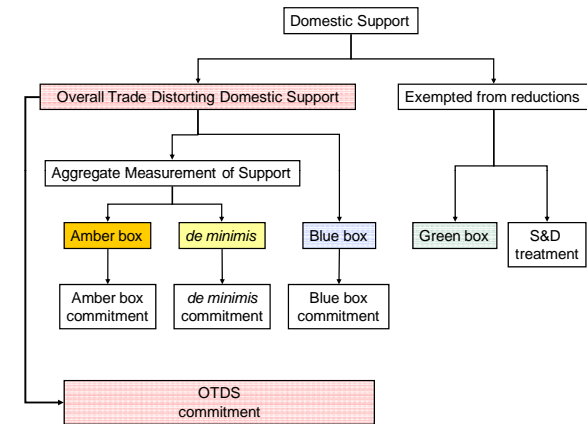
Domestic support in the WTO negotiations – a short overview

WTO – Doha Development Agenda (DDA):

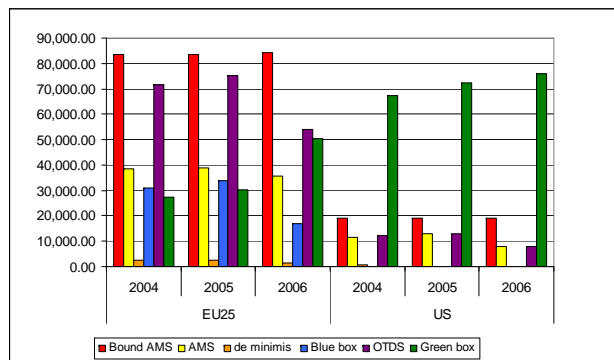
- The Ministerial Declaration calls for „substantial reductions in trade distorting domestic support“
- In the 2004 Framework document for the negotiations the reductions in domestic support are further specified and several new ideas of great significance are included
 - Reduction of Total AMS commitment
 - Reduction in “Overall Trade-Distorting Support” (OTDS)
 - Reduction of *de minimis* percentage
 - Expand criteria for Blue box payments
 - Commitment on sum of Blue box payments



Classification of domestic support in the WTO negotiations



Domestic support in the EU25 and the US (million US Dollar)

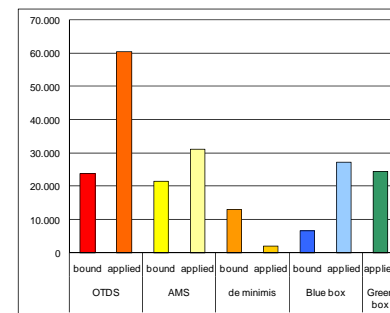


Source: Own calculation based on WTO notifications

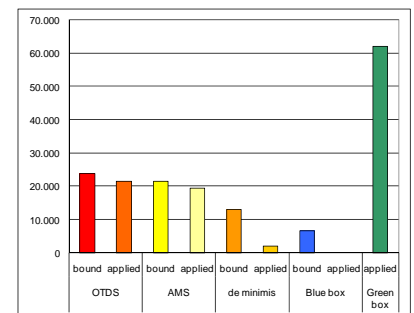


Domestic support in the EU25 in million €

Domestic support in the reporting period 2004/05



Domestic support after box shifting



Source: Own calculation based on WTO notifications; draft modalities for agriculture, Dec. 2008



GTAP database and agricultural domestic support

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- GTAP version 7 database
- Aggregated to 16 regions and 25 commodities
- Agricultural domestic support originates from the OECD PSE tables
 - Two versions of the OECD PSE tables have been used to calculate domestic support rates in the database
- The new PSE categories are specified in 4 types:
 - Activity-specific payments
 - Group- specific payments
 - Activity-generic payments
 - Other transfers
- The EU domestic support is calculated using the old 1999 PSE categories
 - The last type „other transfers“ is important to represent the new decoupled single farm payment



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10 Updating EU25 domestic support PSE payments

by type of support, 2004 (EURO million)



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SINGLE COMMODITY TRANSFERS (SCT)		PDY	WOL
Value of production, OECD	Total 278696
Value of production, EUROSTAT	Total 280241	...	...	...	...
Output	Output payments A2	...	...	...	...
Input	Variable inputs B1	...	...	...	...
	On-farm services B3	...	...	...	...
Land	current A/An/R/I, prod req C	...	...	...	...
	non-current A/An/R/I, prod req D	...	...	...	...
Capital	Fixed capital formation B2	...	...	...	...
	current A/An/R/I, prod req C	...	...	...	...
	non-current A/An/R/I, prod req D	...	...	...	...

ALL (ACT), GROUP (GCT) AND OTHER TRANSFERS (OTP)		ALL	GCT1			Other
			...	...	GCT12	
Input	Variable inputs B1	...	...	...	...	...
	On-farm services B3	...	...	...	...	...
Land	current area, production required C	...	...	...	...	...
	non-current area, production req'd D	...	...	...	...	...
Capital	Fixed capital formation B2	...	...	...	...	...
	current animal, production required C	...	...	...	...	...
	non-current animal, production req'd D	...	...	...	...	...
Labor	current revenue/income, prod req'd C	...	...	...	...	...
	non-current revenue/income, prod req'd D
Total	
Factors	non-current A/An/R/I, prod not req E					...

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and distribution of support into WTO boxes



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Power of support EU25	EU25	PDY	WHT	...	WOL
Value of production	280,242
Value of payments	54,581
Power of domestic support	1.1948	...	...	...	...
% output subsidy	10.2	...	...	...	...
% intermediate input subsidy	11.2	...	...	...	...
% land-based subsidy	50.7	...	...	...	...
% capital-based subsidy	26.2	...	...	...	...
% labor-based subsidy	1.7	...	...	...	...
Total support (EURO million)	54,581	...	...	...	...
Value of output subsidy	5,542	...	...	...	...
Value intermediate input subsidy	6,101	...	...	...	...
Value land-based subsidy	27,686	...	...	...	...
Value capital-based subsidy	14,327	...	...	...	...
Value labor-based subsidy	925	...	...	...	...
Value of output subsidy	amber	...	...	...	...
	blue	...	...	...	...
	green	...	...	...	...
Value intermediate input subsidy	amber	...	...	...	...
	blue	...	...	...	...
	green	...	...	...	...
Value land-based subsidy	amber	...	...	...	...
	blue	...	...	...	...
	green	...	...	...	...
Value capital-based subsidy	amber	...	...	...	...
	blue	...	...	...	...
	green	...	...	...	...
Value labor-based subsidy	amber	...	...	...	...
	blue	...	...	...	...
	green	...	...	...	...

Modeling approach for output subsidies

- The standard GTAP model allows for a differentiation between value of output at agents' price (VOA) and at market price (VOM)
- These values are based on the linear price equation:
agents' price ($ps(i,r)$) = policy variable ($to(i,r)$) + market price ($pm(i,r)$)
- To account for a detailed representation of the WTO's domestic support in the output subsidy we added new policy instruments

Output subsidies				
Values Flows	VOA	VOAg	VOAb	VOM
Prices	ps	psg	psb	pm
Policy Variables	tog		tob	toa

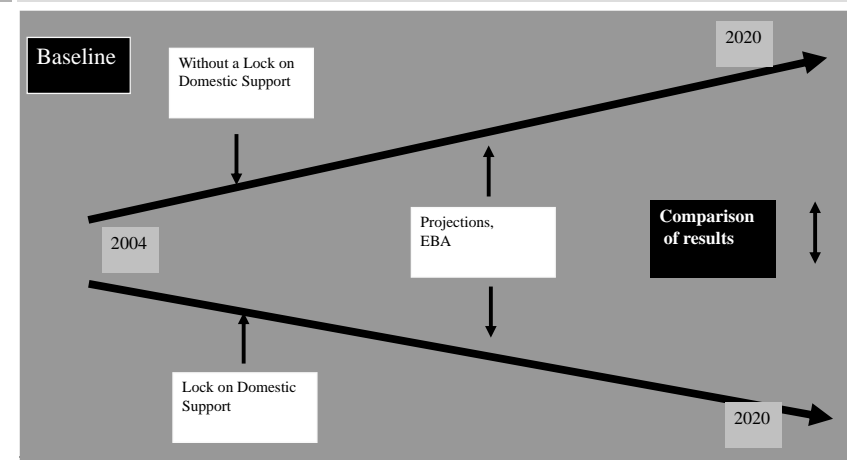
→ Similar extensions for intermediate inputs, land, capital and labor

Limitations

This simple modeling approach raise some questions:

- Other transfers to producer (OTP)
 - Do not require the farmer to produce anything
 - Should be less trade distorting than other payments
 - But the OTP payments amount 1.5 billion € out of a total green box payments of 17.7 billion €
 - How decoupled are the green box payments in the GTAP database?
 - Are they implemented correctly in the database?
- It is not possible to model the AMS
 - Satellite AMS calculation module is required
- Problems in mapping GTAP production changes to the very detailed commodity specific amber box calculation
 - Any post simulations estimation of the amber box can only be considered as a rough estimate

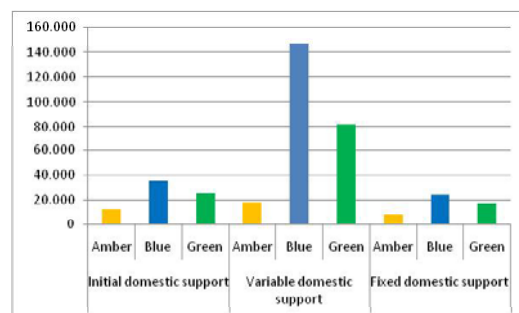
Baseline 2020



Baseline 2020: Value of domestic support in the EU25 by commodity and WTO box, (mill. US\$)

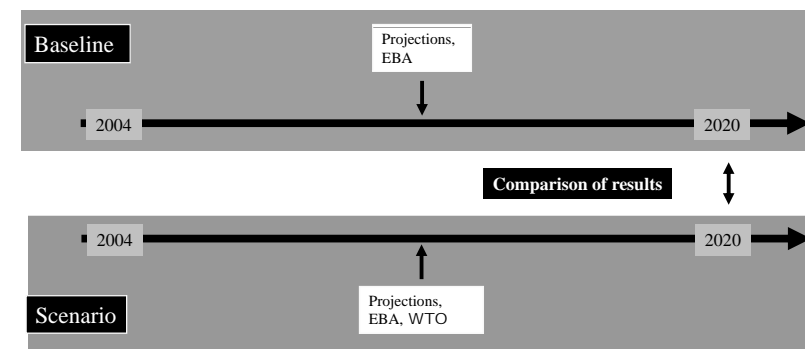
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	Total	% of GDP
Initial domestic support	73,875	0.58
Variable domestic support	247,270	1.83
Fixed domestic support	49,764	0.37



Doha Scenario 2020

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Doha scenario results

In percentage changes

	Contributions from			
	% change of output	Removal of direct aid	Increase OTP payments	Tariff and export subsidy reductions
paddy rice	-19.6	-4.9	0.7	-15.5
wheat	-6.7	-9.7	0.7	2.3
other grains	-1.6	-2.7	0.6	0.5
vegetable & fruit	2.7	1.7	1.9	-1.0
oilseeds	-15.6	-15.8	2.6	-2.3
sugar cane & beet	-24.8	0.0	0.3	-25.1
plant based fiber	9.3	4.8	4.0	0.5
other crops	6.0	2.3	2.4	1.4
cattle, sheep, goats, hoarSES	-14.9	-4.9	1.5	-11.5
other animals	3.9	0.9	1.4	1.5
raw milk	0.5	-0.2	1.4	-0.7
wool	27.6	15.9	1.1	10.6
beef	-45.0	-4.7	1.1	-41.5
other animal products	4.1	0.4	0.7	2.9
vegetable oil & fat	-19.1	-2.0	0.1	-17.3
milkproducts	-1.6	0.0	0.1	-1.7
processed rice	-27.7	-1.7	-0.2	-25.7
sugar	-72.4	0.4	0.1	-72.9
other food products	-0.2	-0.3	0.3	-0.2
MNFCS	0.3	0.1	-0.2	0.4
SVCES	0.1	0.0	0.0	0.1
Real GDP EU25	0.131	0.017	-0.010	0.123
Volume of world trade	1.667	0.016	0.017	1.634

AMS calculation module

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Million USD	AMS 2004	AMS new					Change in AMS
	Total	MPS	EMS	Non-product-specific	Non-exempt payments	Total	
Baseline	26,661	19,381	9,824	847	1,028	31,080	4,419
WTO Sim	26,661	6,107	10,092	847	1,028	18,074	-8,587



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Concluding remarks

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- Detailed implementation of domestic support has received too little attention
- Domestic support is in many cases a country-specific issue
- Needs elaborate work to specify the domestically used agricultural instruments and the according underlying data base
- For a sophisticated WTO analysis of agricultural domestic support it is essential to correctly single out the WTO boxes in the model's data base



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Concluding remarks

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- We have taken version 7 of the GTAP database and updated the representation of EU domestic support payments
- We add supplemented information about the WTO box support to the database and to the model
- We run two illustrative scenarios
 - The results clearly show, that the development of domestic support payments has to be taken into account over time when projecting the GTAP database



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Concluding remarks

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- Employing the extended GTAP framework we are able to model the movement of specific payments found in the PSE tables / GTAP database and reallocate them in the database in a less production and trade distorting manor
 - This is of course not the same as modeling the OTDS
 - The OTDS includes the AMS and the associated *de minimis* payments, which we find impossible to include in the model
 - We therefore add a side calculation of the AMS that is based on the notification tables of the EU to the WTO (administered prices, changes in eligible production)
 - Due to the higher aggregation of the GTAP framework, the post simulation estimate of the AMS is only a rough estimate, but delivers first insights in the development of AMS after the round.



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Outlook

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- AMS-calculation side module further developments!
- GTAP technical paper together with Hans Jensen (FOI) on domestic support!
- Mechanismen to reduce domestic support!



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