

Chapter 11

Protection and Support

A Agricultural Domestic Support

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A.1 Background

This chapter documents how the domestic support levels are retrieved from the OECD Producer Support Estimate (PSE) and incorporated into the GTAP Data Base.

A variety of government policy measures may affect the domestic market price of a commodity, including measures imposed at the border, such as tariffs and export subsidization, as well as quotas on imports or exports. Domestic market interventions may include direct price administration and public stockholding. All these policy interventions alter the domestic market price of a commodity compared to its border price.

The key principles that determine the scope of policy measures to be considered in the estimation and measurement of agricultural support are:

- Transfers are generated to agricultural producers, irrespective of the nature, objectives or impacts
- Transfers are measured in gross terms, without accounting for any adjustments which producers may make to receive the support, e.g. to meet compliance requirements
- Transfers to individual producers are measured at the farm gate level

A.2 PSE, what is included in GTAP?

PSE includes transfers that arise as a result of policies affecting domestic market prices, or market price support (MPS or category A1) and budgetary transfers. MPS is an estimate of indirect transfers to producers that includes the cumulated impact of various policies, notably domestic price

support and border measures such as tariffs. To avoid double counting with the tariffs in the GTAP Data Base, MPS is not included in the GTAP domestic support dataset.

What is included in the GTAP database are transfers to producers other than those affecting market prices for agricultural commodities. These policies provide support based on: (a) actual budgetary transfers; and (b) revenue foregone by the government and other economic agents. Budgetary transfers are the most “visible” policy transfers. They are observed and do not need to be estimated. The measurement of direct budgetary transfers is an accounting task, which consists of the appropriate use of information on budgetary spending.

Budgetary transfers through all government institutions, both national and sub-national, are included. However, budgetary transfers associated with the administration of policies (design, implementation and evaluation) are not included. Budgetary transfers are allocated to calendar years; in cases where agricultural, fiscal and calendar years do not coincide, various procedures are used to attribute transfers appropriately -for example allocate a payment of a particular crop year to the calendar year to which the production of that crop year is attributed.

Producers can also be supported through policy measures whereby governments or other economic agents forego revenue that they would otherwise collect from or charge to producers. Typical forms of revenue foregone are tax concessions, preferential lending, debt restructuring, and administered prices for inputs and services.

Budgetary transfers (and revenue foregone) are classified by OECD into the following broad categories:

- A2. Payments based on output
- B. Payments based on input use
- C. Payments based on current A/An/R/I, production required
- D. Payments based on non-current A/AN/R/I, production required
- E. Payments based on non-current A/AN/R/I, production not required
- F. Payments based on non-commodity criteria
- G. Miscellaneous

Note that PSEs for individual commodities are no longer calculated (as was the case prior to 2007). Instead, a country total PSE is divided into Single Commodity Transfers, Group Commodity Transfers, All Commodity Transfers; and Other Transfers to Producers. This change reflects the fact that as a result of policy reform, support in many OECD countries is less tied to an individual commodity. Support is being increasingly provided to groups of commodities or all commodities in general, or without obliging a recipient to engage in commodity production at all. In this situation the link between some support transfers and individual commodities becomes less apparent. This necessitated an alternative presentation of support transfers with respect to their commodity specificity.

To translate this information into a form that is compatible with the GTAP Data Base, a number of manipulations are necessary. Standard formulas are applied to each country to allocate these transfers into GTAP support categories:

- Output payments (OECD's A2)
- Intermediate input payments (OECD's B1, B3)
- Land based payments (OECD's C, D)
- Capital based payments (OECD's B2, C, D)
- Labor based payments (OECD's C, D)
- All factors (E)
- Not allocated in GTAP (OECD's A1, F, G)

The OECD classification is based on implementation criteria—independently of objectives or effects. This is an important distinction as a given objective may be achieved through different measures. For a given policy measure, the implementation criteria are defined as the conditions under which the associated transfers are provided to farmers or the conditions of eligibility for the payment.

In the GTAP Data Base, the treatment of land and capital subsidies differs somewhat depending on whether the commodity/group is crop or animal based. Payments based on crop area in categories C and D are assigned to land-based subsidies. Payments based on animal numbers in categories C and D, and to fixed capital formation in category B are assigned to capital-based subsidies. Finally, payments based on receipt or income in categories C and D are assigned to labor-based subsidies.

The aggregate power of domestic support is calculated by dividing the total value of payments by the value of production (as published by OECD) and adding 1 to the total. The percentage value shares of output, input, land, labor, capital, and all factors subsidies are then used to allocate these payments to the corresponding tax wedges in GTAP.

The country coverage consists of 27 member and non-member countries, listed in Table 11.1. The European Union is represented as a single entity (no EU member country information is available). Domestic support for the European Union is further disaggregated for the individual member states by our colleagues at the Joint Research Center and are not reported in this document. Table 1 also presents the exchange rates used. All countries use millions of local currency. Except Japan and Korea that report billions of local currency.

PSE data spans from 1986 to the present. For GTAP, we focus on the reference years, for GTAP 11 these are five (i.e., 2004, 2007, 2011, 2014, and 2017). OECD reports quantities and values for 72 products, which are mapped to GTAP, see Table 11.2.

Table 11.1: 27 Countries List and Exchange Rate (current local currency to USD) in 2017

ISO3	Country	Local currency	Exchange rate
ARG	Argentina	Argentine peso	16.56
AUS	Australia	Australian dollar	1.3
BRA	Brazil	Brazilian real	3.19
CAN	Canada	Canadian dollar	1.3
CHE	Switzerland	Swiss franc	0.98
CHL	Chile	Chilian peso	648.68
CHN	China	Renminbi-yuan	6.76
COL	Colombia	Colombian peso	2951.29
CRI	Costa Rica	Costa Rica Colon	567.78
E28	European Union	Euro	0.89
IDN	Indonesia	Indonesia Rupiah	13381.48
IND	India	Indian rupee	65.12
ISL	Iceland	Islandic krona	106.82
ISR	Israel	Israeli shekel	3.6
JPN	Japan	Japanese Yen	112.18
KAZ	Kazakhstan	Kazakhstani tenge	325.62
KOR	Republic of Korea	Korean Won	1130.63
MEX	Mexico	Mexican peso	18.87
NOR	Norway	Norwegian krone	8.27
NZL	New Zealand	New Zealand dollar	1.41
PHL	Philippines	Philippine Peso	50.4
RUS	Russian Federation	Russian rouble	58.33
TUR	Turkey	New Turkish lira	3.65
UKR	Ukraine	Ukrainian hryvnia	26.6
USA	United States of America	US dollar	1
VNM	Viet Nam	Viet Nameese Dong	22715.36
ZAF	South Africa	South African Rand	13.31

Source: OECD (2021)

Table 11.2: Single Commodities Quantities and Value in 2017

Single Commodity	Description	GTAP Sector	Quantity (kiloton)	Value (mn USD)
AF	Alfalfa	OCR	50,631.81	8,595.05
AP	Apples	V_F	47,358.96	23,322.83
AV	Avocado	V_F	378.72	674.86
BA	Barley	GRO	119,442.97	19,171.16
BF	Beef and veal	CTL	55,442.18	228,302.61
BL	Blueberries	V_F	141.00	449.72
BN	Beans	V_F	1,506.27	1,056.51
BS	Bananas	V_F	52,051.17	15,696.84
CC	Chinese cabbage	V_F	3,823.69	1,873.68
CF	Coffee	OCR	6,701.74	15,269.48
CH	Cherries	V_F	97.58	427.27
CN	Coconut	V_F	14,049.13	2,402.63
CO	Cocoa beans	OCR	585.20	939.15
CP	Chick pea	V_F	11,379.19	7,691.92
CS	Cashew nuts	V_F	624.72	776.86
CT	Cotton	PFB	23,157.19	36,158.24
CU	Cucumber	V_F	559.50	1,225.68
CV	Cassava	V_F	19,054.00	3,850.25
CW	Common wheat	WHT	142,599.48	26,295.07
DW	Durum wheat	WHT	8,997.66	2,185.07
EG	Eggs	OAP	69,889.67	83,060.36
FL	Plants and flowers	OCR	235.80	23,072.48
FV	Fruits and vegetables	V_F	-	1,909.21
FX	Flaxseed	OSD	555.10	197.99
GA	Garlic	V_F	303.58	987.82
GN	Groundnuts	OSD	18,518.64	20,091.17
GP	Grapefruit	V_F	149.00	107.92
GR	Grapes	V_F	5,829.90	4,800.92
IF	Fruit and vegetables imported	V_F	-	57,786.84
LN	Lentils	V_F	2,558.50	936.20
MA	Maize	GRO	1,012,343.06	172,856.41
MG	Mango	V_F	22,559.33	10,655.40
MK	Milk	RMK	664,669.90	272,884.41
MN	Mandarin	V_F	741.30	1,534.99
OA	Oats	GRO	19,214.73	2,785.17
OG	Other grains	GRO	-	-
ON	Onion	V_F	23,262.30	4,676.33
OP	Other pulses	V_F	-	9,280.80
OR	Orange	V_F	1,455.96	864.72
PA	Pineapple	V_F	5,988.74	2,009.25
PB	Pepper	V_F	423.69	1,232.23
PC	Peaches	V_F	121.36	88.20
PE	Dry peas	V_F	4,112.20	839.48
PI	Plantain	V_F	3,997.00	1,698.85
PK	Pig meat	OAP	111,391.10	274,365.93
PL	Palm Oil	OSD	36,843.72	17,438.04
PO	Potatoes	V_F	172,332.54	30,271.62
PP	Red pepper	V_F	55.71	616.75
PR	Pears	V_F	245.40	681.03

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Single Commodity	Description	GTAP Sector	Quantity (kiloton)	Value (mn USD)
PT	Poultry meat	OAP	100,254.67	185,595.35
RB	Rubber	OCR	4,764.10	4,629.21
RI	Rice	PDR	433,071.46	214,509.80
RP	Rapeseed	OSD	67,881.66	33,310.31
RS	Refined sugar	C_B	811,998.49	64,989.91
RY	Rye	GRO	3,056.57	304.99
SB	Soybeans	OSD	309,977.92	100,744.42
SF	Sunflower	OSD	41,225.88	14,729.73
SH	Sheep meat	CTL	9,578.04	55,112.40
SO	Sorghum	GRO	16,026.42	2,314.55
SP	Spinaches	V_F	228.10	992.13
SW	Strawberries	V_F	163.70	1,561.73
TB	Tobacco	OCR	94.00	419.40
TE	Tea	OCR	971.50	349.23
TM	Tomatoes	V_F	54,726.99	29,429.82
WI	Wine	V_F	17,009.60	24,601.65
WL	Wool	WOL	545.63	3,542.53
WM	Water melon	V_F	-	-
WO	Welsh Onion	V_F	458.80	1,477.05
WT	Wheat	WHT	507,006.69	115,230.48
XE	Non MPS commodities	V_F	-	891,241.51
XEFV	XEFV	OT	-	-
XF	Fruit and vegetables exported	V_F	-	363,950.55

A.3 Data retrieval using R

We use R software to retrieve the data from OECD. First need to download the data for every country covered in the OECD's PSE dataset.¹ While each of the country excel files contain all available years, the following process is established for one reference year at a time. Original data is measured in local currency and is converted to millions of current USD.

Group commodities 1 to 9 are consistent across countries, but group commodities 10 onwards are defined differently across countries. Table 11.3 presents the common group commodities definitions in terms of GTAP sectors while Table 11.4 displays the composition of the remaining group commodities according to their GTAP sector composition.

¹This R code works because of the consistent format of the excel files.

Table 11.3: Common Group Commodity Composition

GCT	Description	GTAP Sector
GCT1	All crops	pdr, wht, gro, v_f, osd, c_b, pfb, ocr
GCT2	All arable crops	pdr, wht, gro, osd, c_b, pfb
GCT3	Grains	pdr, wht, gro
GCT4	Oilseeds	osd
GCT5	Other crops	v_f, ocr
GCT6	All fruits and vegetables	v_f
GCT7	All livestock	ctl, oap, rmk, wol
GCT8	Ruminants	ctl, rmk, wol
GCT9	Non-ruminants	oap

We begin the collection of domestic support with other transfer payments. Other transfers to producers do not oblige a recipient to engage in commodity production at all. However, even if they choose not to produce, at least some minimum investment is usually required (e.g. maintain the land in good agricultural condition). Transfers in category E are allocated equiproportionally to all commodities and all factors of production.

Transfers in category F and G are based on non-commodity criteria such as long-term resource retirement (e.g. wetlands, conservation reserve) or non-commodity output (e.g. hedges). Because these do not relate to commodity production, they are not allocated in the GTAP Data Base.

For single commodity payments, the same principles are followed as in GTAP 6, allocating payments by factor to specific commodities. Since GTAP 7, the key difference arising from the new OECD classification relates to group transfers-payments, which are allocated equiproportionally across the sectors according to whether they apply to all commodities (ACT), or to groups of commodities (GCT, e.g. crops). That is, to reflect the fact that some payments are provided without requirements to produce specific commodities, the marginal incentive of the payment is equalized across the commodities concerned.

Table 11.4: Specific Group Commodity Composition by country

ISO3	GCT10	GCT11	GCT12	GCT13	GCT14	GCT15	GCT16
E28	ocr	wht, gro, osd, ocr	ctl, rmk	NA	NA	NA	NA
AUS	oap	NA	NA	NA	NA	NA	NA
CAN	pdr, wht, gro, v_f, osd, c_b, pfb, ocr	oap	NA	NA	NA	NA	NA
ASL	ctl, wol	rmk, ctl	NA	NA	NA	NA	NA
JPN	wht, gro, osd	NA	NA	NA	NA	NA	NA
KOR	ctl, rmk	ctl, oap	NA	NA	NA	NA	NA
MEX	gro, v_f	gro, osd	ocr	v_f	v_f	v_f, ocr	gro, v_f, pdr
NZL	ctl, wol, rmk	NA	NA	NA	NA	NA	NA
NOR	NA	v_f	ocr	NA	NA	NA	NA
CHE	pdr, wht, gro,osd	pdr, wht, gro, v_f, osd, c_b, pfb, ocr	pdr, wht, gro, v_f, osd, c_b, pfb, ocr, ctl	v_f	NA	NA	NA
TUR	NA	wht, c_b, pfb, osd	ocr	NA	NA	NA	NA
USA	v_f	v_f	pdr, wht, gro, osd, c_b, pfb	NA	NA	NA	NA
ISR	v_f	v_f	v_f	ctl	NA	NA	NA
CHN	osd, wht, gro	wht, pdr, gro, osd, pfb	NA	NA	NA	NA	NA
IDN	pdr, gro, osd	NA	NA	NA	NA	NA	NA
KAZ	rmk, ctl	ocr	v_f	NA	NA	NA	NA
RUS	v_f	oap	NA	NA	NA	NA	NA
UKR	pdr, wht, gro, v_f, osd, c_b, pfb, ocr, wol	gro, osd	NA	NA	NA	NA	NA
ZAF	ctl	ocr	NA	NA	NA	NA	NA
IND	v_f	NA	NA	NA	NA	NA	NA
ARG	ctl, rmk	NA	NA	NA	NA	NA	NA