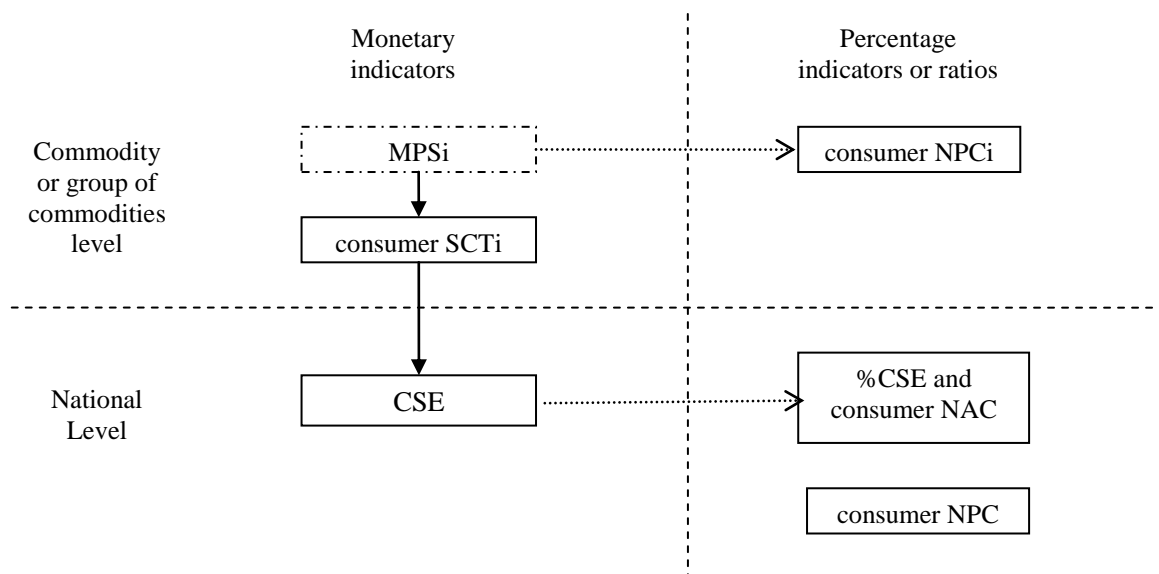


**CHAPTER 7.**

**CALCULATING INDICATORS OF SUPPORT TO CONSUMERS**

313. In a similar way to Chapter 6, this chapter details the method for bringing the relevant transfers together to calculate the indicators of consumer support. The process begins by using the transfers calculated for Market Price Support (MPS<sub>i</sub>) to obtain consumer single commodity transfers for individual commodities (consumer SCT<sub>i</sub>). These are then used to calculate a Consumer Support estimate (CSE) for the country as a whole. From these nominal indicators, the relative indicators of support can then be derived, including consumer Nominal Protection Coefficients for individual commodities (consumer NPC<sub>i</sub>) and a country (consumer NPC), as well as %Consumer Support Estimate (%CSE) and consumer Nominal Assistance Coefficient (consumer NAC).

**Diagram 7.1. The procedure for calculating indicators of support to consumers**



### 7.1. Consumer Single Commodity Transfers (consumer SCT) for individual commodities

**Consumer Single Commodity Transfers (consumer SCT):** the annual monetary value of gross transfers to consumers of agricultural commodities, measured at the farm gate level, arising from policies linked to the production of a single commodity.

- Consumer SCT values are calculated for individual commodities by adding compensatory budget payments to consumers to price transfers from consumers (PTC)

314. The process begins by calculating a consumer SCT value for each of the individual commodities for which MPS has been calculated in [sub-section 6.1.1](#).

$$consumerSCT_i = TCT_i - (TPC_i + OTC_i) + EFC_i \quad [7.1]$$

where:  $TCT_i$  – Transfers to Consumers from Taxpayers for commodity  $i$

$TPC_i$  – Transfers to Producers from Consumers of commodity  $i$

$OTC_i$  – Other Transfers from Consumers of commodity  $i$

$EFC_i$  – Excess Feed Cost of commodity  $i$  (crop commodities only)

315.  $TCT$  are budgetary payments to consumers that are given for the specific purpose of compensating them for the higher prices they pay for agricultural products that result from policies that support producer prices. An example of such transfers is subsidies to the first purchasers of agricultural commodities such as mills, dairies or slaughterhouses. The  $TCT$  is obtained from the information on budgetary expenditures.

316. The sum of the other three components in equation 7.1 corresponds to Price Transfers from Consumers ( $PTC$ ), explained in detail in [section 4.3](#).

317. The information and analysis used to calculate MPS in [sub-section 6.1.1](#) is used as the basis for carrying out these calculations, *i.e.* the same values for  $MPD$ , production, consumption, etc. are used: in the example, the  $MPD$  is zero in the case of oats and potatoes. As for MPS, the  $TPC$  value is generally the largest component of a consumer SCT for a commodity. However, instead of being added as a value transferred as support to producers, it is subtracted as a value transferred away from consumers. If consumption is greater than production, then consumers also pay the  $MPD$  on the remaining volume of consumption, supplied from imports ( $OTC$ ).

318. Table 7.1 demonstrates the procedure for calculating consumer SCT for individual commodities based on the example introduced in [Chapter 6](#). Note that the sum of  $EFC$  for the individual commodities (LC 22 million) in this calculation is the same as that calculated for MPS ([Table 6.4](#)), except that in this case it is added back into transfers from consumers rather than subtracted from transfers to producers.

Chapter 7. Calculating Indicators of Support to Consumers

Table 7.1. Calculation of consumer SCT for individual commodities

(example)

Symbol	Description	Units	Wheat	Barley	Oats	Milk	Beef	Cotton	Potatoes	Source / equation
$QP_i$	Level of production	000 T	250	110	50	200	100	360	160	Data
$QC_i$	Level of consumption	000 T	200	150	200	300	75	400	120	Data or $(QP_i + QM_i - QX_i + STK)$
$QC_{feed\ i}$	of which quantity of crop i consumed for feed	000 T	90	110	40	-	-	-	-	Data
$MPD_i$	Market price differential	LC/T	170	60	0	650	500	50	0	Table 6.2
$TCT_i$	Transfer to consumers from taxpayers	LC million	0	0	0	50	0	10	0	Data
$TPC_i$	Transfers to producers from consumers	LC million	34	7	0	130	38	18	0	If $QC_i > QP_i$ then $MPD_i * QP_i$ otherwise $MPD_i * QC_i$
$OTC_i$	Other transfers from consumers	LC million	0	2	0	65	0	2	0	If $QC_i > QP_i$ then $MPD_i * (QC_i - QP_i)$ otherwise 0
$EFC_i$	Excess Feed Cost (for feed crops only)	LC million	15	7	0	-	-	-	-	$MPD_i * QC_{feed\ i}$
<b>Consumer SCT<sub>i</sub></b>	<b>Consumer Single Commodity Transfers</b>	<b>LC million</b>	<b>-19</b>	<b>-2</b>	<b>0</b>	<b>-80</b>	<b>-38</b>	<b>-10</b>	<b>0</b>	<b><math>TCT_i - (TPC_i + OTC_i) + EFC_i</math></b>

## 7.2. Consumer Support Estimate (CSE)

**Consumer Support Estimate (CSE):** the annual monetary value of gross transfers from (to) consumers of agricultural commodities, measured at the farm gate level, arising from policy measures that support agriculture, regardless of their nature, objectives or impacts on consumption of farm products.

- CSE values are calculated by adding all TCT values, extrapolated TPC and OTC values, and EFC values

319. Once consumer SCT values have been calculated for individual commodities, a national (aggregate) CSE value can be calculated by a similar method:

$$CSE = TCT_C - (TPC_C + OTC_C) + EFC_C \quad [7.2]$$

320. The national (aggregate) value of transfers to consumers from taxpayers is found by adding together the value of *TCT* for all the individual commodities for which MPS has been calculated with any additional *TCT* that are provided to consumers of non-MPS commodities, that is:

$$TCT_C = \sum_{i \in AMC} TCT_i + TCT_{XE} \quad [7.3]$$

321. National (aggregate) values for *TPC* and *OTC* are derived by extrapolating from *TPC* and *OTC* for the individual commodities according to:

$$TPC_C = \frac{\sum_{i \in AMC} TPC_i}{\sum_{i \in AMC} VP_i} \times VP_C \quad \text{and} \quad OTC_C = \frac{\sum_{i \in AMC} OTC_i}{\sum_{i \in AMC} VP_i} \times VP_C \quad [7.4]$$

where:  $\sum_{i \in AMC} TPC_i$  – *TPC* for All MPS commodities

$\sum_{i \in AMC} OTC_i$  – *OTC* for All MPS commodities

$\sum_{i \in AMC} VP_i$  – value of production for All MPS commodities

322. The national (aggregate) EFC value is found by adding together the value of EFC for the individual feed crop commodities for which MPS has been calculated:

$$EFC_C = \sum_{i \in AMC} EFC_i$$

323. Table 7.2 demonstrates this procedure.

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Table 7.2. Calculation of CSE

(example)

Symbol	Description	LC million	Source / equation
$VP_C$	Total value of production (at farm gate)	2 325	Table 6.2
$VP_{AMC}$	Value of production of MPS commodities	1 696	Table 6.2
$TCT_C$	Transfers to consumers from taxpayers	70	$TPT_{AMC} + TPT_{XE}$
$TCT_{AMC}$	Transfers to consumers from taxpayers for MPS commodities	60	Table 7.1 (sum of $TCT_i$ for All MPS commodities)
$TCT_{XE}$	Transfers to consumers from taxpayers for non-MPS commodities	10	Data
$TPC_C$	Transfers to producers from consumers	310	$TPC_{AMC} / VP_{AMC} * VP_C$
$TPC_{AMC}$	Transfers to producers from consumers of MPS commodities	226	Table 7.1 (sum of $TPC_i$ for All MPS commodities)
$OTC_C$	Other transfers from consumers	95	$OTC_{AMC} / VP_{AMC} * VP_C$
$OTC_{AMC}$	Other transfers from consumers of MPS commodities	69	Table 7.1. (sum of $OTC_i$ for All MPS commodities)
$EFC_C$	Excess Feed Cost (for feed crops only)	22	Table 7.1 (sum of $EFC_i$ for MPS crop commodities)
<b>CSE</b>	<b>Consumer Support Estimate</b>	<b>-313</b>	<b><math>TCT_C - TPC_C - OTC_C + EFC_C</math></b>

### 7.3. Percentage CSE (%CSE) and Consumer Nominal Assistance Coefficient (consumer NAC)

**Percentage CSE (%CSE):** CSE as a share of consumption expenditure on agricultural commodities (at farm gate prices), net of taxpayer transfers to consumers.

**Consumer Nominal Assistance Coefficient (consumer NAC):** the ratio between the value of consumption expenditure on agricultural commodities (at farm gate prices) and that valued at border prices (measured at farm gate).

- %CSE and consumer NAC values are calculated at national (aggregate) level

324. The %CSE for a country is calculated by dividing the CSE by the value of consumption expenditure, *i.e.* value of consumption less transfers to consumers from taxpayers (*TCT*), and multiplying the result by 100. Value of consumption is adjusted for *TCT* because it effectively reduces consumer expenditure. This is expressed as:

$$\%CSE = \frac{CSE}{VC_C - TCT_C} \times 100 \quad [7.5]$$

where:  $VC_C$  – value of consumption in country *C*

325. The national (aggregate) value of consumption is found by extrapolating the sub-total value of consumption for All MPS commodities as follows:

$$VC_C = \frac{\sum_{i \in AMC} VC_i}{\sum_{i \in AMC} VP_i} \times VP_C = \frac{\sum_{i \in AMC} (PP_i \times QC_i)}{\sum_{i \in AMC} VP_i} \times VP_C \quad [7.6]$$

where:  $\sum_{i \in AMC} VC_i$  – value of consumption for All MPS commodities

$\sum_{i \in AMC} VP_i$  – value of production for All MPS commodities

326. The value of consumption for an individual MPS commodity is derived by multiplying the producer price by the quantity of consumption. It differs from the value of production to the extent that commodities are imported or exported. Working through this formula in the example results in a %CSE of -12% (Table 7.3)

327. The consumer NAC is calculated by dividing the value of consumption by the value of consumption at border prices. Expressed algebraically:

$$consumerNAC = \frac{VC_C}{VC_C + CSE} \quad [7.7]$$

328. The consumer NAC is mathematically related to the %CSE, and can be alternatively derived as:

$$consumerNAC = 1 - \frac{\%CSE}{(100 - \%CSE)} \quad [7.8]$$

329. Working through this formula in the example results in a consumer NAC of 1.14.

#### 7.4. Consumer Nominal Protection Coefficient (consumer NPC)

**Consumer Nominal Protection Coefficient (consumer NPC):** the ratio between the average price paid by consumers (at farm gate) and the border price (measured at farm gate).

- Consumer NPC values may be calculated for individual commodities and at national (aggregate) level.

330. As for the producer NPC, the consumer NPC indicator is first calculated at the individual commodity level. The results are then used to derive a national (aggregate) consumer NPC.

##### 7.4.1. Consumer NPC for individual commodities

331. The consumer NPC for an individual commodity is derived by comparing domestic and border prices, where the domestic price is the consumer price. *Note that the consumer price is equal to producer price, which follows from the definition of consumer as a first-stage buyer of agricultural commodity.*

$$consumerNPC_i = \frac{PP_i}{RP_i} \quad [7.9]$$

where:  $PP_i$  – consumer price of commodity  $i$

$RP_i$  – reference price of commodity  $i$

332. The difference between the consumer and producer NPC is that the latter includes the per unit value of output support that is provided to producers through policies which do not affect market prices (sub-category A.2 *Payments based on output*). Table 7.4 illustrates the calculation of consumer NPC for individual commodities.

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**Table 7.3. Calculation of %CSE and consumer NAC (example)**

Symbol	Description	Units	Value	Source / equation
$VP_C$	Total value of production (at farm gate)	LC million	2 325	Table 6.2
$VP_{AMC}$	Value of production of MPS commodities	LC million	1 696	Table 6.2
$VC_C$	Total value of consumption (at farm gate)	LC million	2 628	$VC_{AMC} / VP_{AMC} * VP_C$
$VC_{AMC}$	Value of consumption of MPS commodities	LC million	1 917	Table 7.4 (sum of $VC_i$ of All MPS commodities)
$CSE_C$	Consumer Support Estimate	LC million	-313	Table 7.2
$TCT_C$	Transfers to consumers from taxpayers	LC million	70	Table 7.2
<b>%CSE</b>	<b>Percentage Consumer Support Estimate</b>	<b>%</b>	<b>-12</b>	<b><math>CSE / (VC - TCT) * 100</math></b>
<b>Consumer NAC</b>	<b>Consumer Nominal Assistance Coefficient</b>	<b>Ratio</b>	<b>1.14</b>	<b><math>VC / (VC + CSE)</math></b> <b><math>1 - \%CSE / (100 + \%CSE)</math></b>

**Table 7.4. Calculation of consumer NPC for individual commodities (example)**

Symbol	Description	Units	Wheat	Barley	Oats	Milk	Beef	Cotton	Potatoes	Source / equation
$QC_i$	Level of consumption	000 T	200	150	200	300	75	400	120	Table 7.1
$PP_i$	Producer price (at farm gate)	LC/T	2 060	1 260	1 040	2 000	2 500	500	1 000	Table 6.3
$RP_i$	Reference Price (at farm gate)	LC/T	1 890	1 200	1 040	1 350	2 000	450	1 000	Table 6.3
$TPC_i$	Transfers to producers from consumers	LC million	34	7	0	130	38	18	0	Table 7.1
$OTC_i$	Other transfers from consumers	LC million	0	2	0	65	0	2	0	Table 7.1
$VC_i$	Value of consumption (at farm gate)	LC million	412	189	208	600	188	200	120	$PP_i * QC_i$
<b>Consumer NPC<sub>i</sub></b>	<b>Consumer NPC<sub>i</sub></b>	<b>Ratio</b>	<b>1.09</b>	<b>1.05</b>	<b>1.00</b>	<b>1.48</b>	<b>1.25</b>	<b>1.11</b>	<b>1.00</b>	<b><math>PP_i / RP_i</math> or</b> <b><math>VC_i / (VC_i - TPC_i - OTC_i)</math></b>

**7.4.2. Consumer NPC for a country**

333. As prices and quantities cannot be aggregated over a variety of different commodities, the consumer NPC for a country is calculated based on the value of transfers:

$$consumerNPC = \frac{VC_c}{(VC_c - TPC_c - OTC_c)} \quad [7.10]$$

where:  $VC_c$  – total value of production for country  $C$

$TPC_c$  – total Transfers to Producers from Consumers for country  $C$

$OTC_c$  – total Other Transfers from Consumers for country  $C$

334. The consumer NPC for individual commodities can also be calculated based on the transfer values method, by simply substituting in the appropriate values for the individual commodity into the equation 7.10. This is also shown in Table 7.4.

335. Table 7.5 shows the calculation of a national (aggregate) consumer NPC, which at 1.18 is exactly the same as the aggregate consumer NPC for All MPS commodities. Note that the national (aggregate) consumer NPC is lower than the producer NPC of 1.20 – the difference is due to the payments based on output received by producers, which represent transfers from taxpayers and not from consumers.

**7.4.3. Consumer NPC for other commodities**

336. A consumer NPC for “other commodities”, *i.e.* non standard MPS commodities, can also be calculated. Again, this is based on the value method rather than the price method as an average price for the set of “other commodities” cannot be calculated. To obtain the necessary values for other commodities, values for the standard MPS commodities for which MPS has been calculated are subtracted from the national (aggregate) values:

$$consumerNPC_{OC} = \frac{(VC_c - \sum_{i \in SMC} VP)_i}{\left( (VC_c - \sum_{i \in SMC} VC_i) - (TPC_c - \sum_{i \in SMC} TPC_i) - (OTP_c - \sum_{i \in SMC} OTP_i) \right)} \quad [7.14]$$

337. Table 7.6 illustrates how this calculation is performed. Note that in this instance the resulting consumer NPC for other commodities (1.14) is lower than the national (aggregate) consumer NPC (1.18) because the consumer NPC derived for the standard commodities (1.21) is higher than that for national average.

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**Table 7.5. Calculation of a national (aggregate) consumer NPC (example)**

Symbol	Description	Units	All MPS commodities (AMC)	National (aggregate) (C)	Source / equation
$VC_i$	Value of consumption (at farm gate)	LC million	1 917	2 628	Table 7.3
$TPC_i$	Transfers to producers from consumers	LC million	226	310	Table 7.2
$OTC_i$	Other transfers from consumers	LC million	69	95	Table 7.2
<b>Consumer NPC<sub>i</sub></b>	<b>Consumer NPC<sub>i</sub></b>	<b>Ratio</b>	<b>1.18</b>	<b>1.18</b>	<b><math>VC_i / (VC_i - TPC_i - OTC_i)</math></b>

**Table 7.6. Calculation of a consumer NPC for Other Commodities (example)**

Symbol	Description	Units	National (aggregate) (C)	Standard MPS commodities (SMC)	Other commodities (OC)	Source / equation
$VC_i$	Value of consumption (at farm gate)	LC million	2 628	1 597	1 031	$VC_C$ - Table 7.5; $VC_{SMC}$ : Table 7.4 $VC_{OC} = VC_C - VP_{SMC}$
$TPC_i$	Transfers to producers from consumers	LC million	310	208	102	$TPC_C$ : Table 7.5; $TPC_{SMC}$ : Table 7.4 $TPC_{OC} = TPC_C - TPC_{SMC}$
$OPT_i$	Other transfers from consumers	LC million	95	67	28	$OTP_C$ : Table 7.5; $OTP_{SMC}$ : Table 7.4 $OTP_{OC} = OTP_C - OTP_{SMC}$
<b>Consumer NPC<sub>i</sub></b>	<b>Consumer NPC<sub>i</sub></b>	<b>Ratio</b>	<b>1.18</b>	<b>1.21</b>	<b>1.14</b>	<b><math>VC_i / (VC_i - TPC_i - OPT_i)</math></b>