Working Party on Agricultural Policies and Markets

Presentation of the Draft
MANUAL FOR CALCULATING THE OECD'S PRODUCER SUPPORT ESTIMATE
AND RELATED INDICATORS OF AGRICULTURAL SUPPORT

This document is submitted for DISCUSSION under item 13 of the draft agenda of the 44th session of the Working Party on Agricultural Policies and Markets, to be held in Paris on 5-7 November 2007.

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NOTE BY THE SECRETARIAT

This document presents a draft *Manual for calculating the OECD’s Producer Support Estimate and related indicators of agricultural support* (the Manual). The project is part of the Programme of Work of the Committee on Agriculture for 2007-08. It was funded in part by the European Commission.

The purpose of the Manual is to provide a single but comprehensive source of information on OECD’s methodology for measuring agricultural support.

It is addressed to a broad range of users and is to be used in conjunction with the indicator (PSE/CSE) database and country specific documentation (the cookbooks).

In its final format, the Manual will be made available on the public internet site of the Trade and Agriculture Directorate as an inter-active and up-datable electronic book. It is not intended to make copies available in the traditional book format.

A large number of contributors participated in the preparation of the Manual. Darryl Jones developed the structure and prepared many chapters and sections. Olga Melyukhina from the Secretariat co-ordinated the project and was the author of several sections. Other substantive contributors from the Secretariat were: Carmel Cahill, Andrea Cattaneo, Dimitris Diakosavvas, Hsin Huang, Joanna Komorowska, Wilfrid Legg, Roger Martini, Catherine Moreddu, Frank van Tongeren and Vaclav Vojtec. The Manual has benefited from an in-depth review by Ken Ash, Carmel Cahill, Wilfrid Legg and Stefan Tangermann. Jesus Anton, Alexandra de Matos Nunes, Shingo Kimura, Jussi Lankoski and Monika Tothova also reviewed the text and made detailed comments. Michèle Patterson provided editorial assistance.

The Manual is presented to the APM for discussion. It is expected that revisions to the text will be made following the comments received. As concerns the new PSE classification and the newly introduced indicators, the text is based on the definitions and presentation applied in the 2007 Monitoring and Evaluation Report. Should any changes to these definitions and presentation be agreed by the APM, as a result of the recommendations of the PSE Expert Group meeting of 1-2 October 2007, they will also be incorporated into the Manual. It is also intended to have the Manual reviewed by a small number of external readers in order to receive feedback on how well the text can be understood by potential users.

The final text will be used for production of an electronic book. This format will enable users to orient themselves and navigate easily across the Manual, select the parts of primary interest, choose between general descriptions and more technical parts and, if needed, refer to numerical examples. The Secretarial envisages to take professional advice on preparation of the electronic book. A small brainstorming type meeting between the Secretariat, the publications specialists and the external users who have been asked to review the text may be organised in December 2007 to assist the Secretariat in bringing the work on the Manual to a conclusion.
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<td>ACT</td>
<td>All Commodity Transfers</td>
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<tr>
<td>AMS</td>
<td>Aggregate Measurement of Support</td>
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<td>CAIS</td>
<td>Canadian Agricultural Income Stabilisation programme</td>
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<td>CAP</td>
<td>Common Agricultural Policy (of the European Union)</td>
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<td>CIF</td>
<td>Cost, Insurance and Freight</td>
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<td>COP</td>
<td>Cereals, oilseeds and protein crops</td>
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<td>CSE</td>
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<td>ERA</td>
<td>Effective Rate of Assistance</td>
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<td>Effective Rate of Protection</td>
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<td>EU</td>
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<td>FAO</td>
<td>Food and Agricultural Organisation of the United Nations</td>
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<td>Free On Board</td>
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<td>GDP</td>
<td>Gross Domestic Product</td>
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<td>GSSE</td>
<td>General Services Support Estimate</td>
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<td>GTAP</td>
<td>Global Trade Analysis Project</td>
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<td>Global Trade Analysis Project – Policy Evaluation Model</td>
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<tr>
<td>IMF</td>
<td>International Monetary Fund</td>
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<td>MFN</td>
<td>Most Favoured Nation</td>
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<td>OECD</td>
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<td>RDR</td>
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<td>Tariff-rate-quota</td>
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<td>URAA</td>
<td>Uruguay Round Agreement on Agriculture</td>
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<td>VAT</td>
<td>Value Added Tax</td>
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PART I

MAIN CONCEPTS
CHAPTER 1
INTRODUCTION

1.1. Objectives

1. The main objectives of this manual are the following:

- To provide a comprehensive description of the methodology to calculate OECD indicators of agricultural support by using descriptive text, mathematical equations and empirical examples.
- To describe the economic theory and principles which underlie this methodology.
- To illustrate the practical application of this methodology, how best to deal with data limitations, and to assist those wishing to replicate the method and apply it to other countries or commodities.
- To explain how these indicators can be used for policy evaluation and modelling.

2. This manual is to be used in conjunction with other publicly available documentation, including the annual report *Agricultural Policies in OECD Countries*, the bi-annual report *Agricultural Policies in Non-OECD Countries: Monitoring and Evaluation*; and the indicator database incorporating country specific documentation, available on the web-site [www.oecd.org/agr/support](http://www.oecd.org/agr/support).

1.2. Target audience

3. This manual will be of assistance to those wanting to gain a greater appreciation of the method and process to calculate the indicators, including:

- Policy makers and analysts who would like to use the methodology for policy evaluation, to classify a new policy measure, or to evaluate the impact of a policy change on the indicators.
- Researchers who would like to use the economic information contained within the database or to calculate the indicators for other commodities or countries.
- Modellers who would like to use the information contained in the indicator database as an input into their own models, so that they understand the character of information and how to appropriately link it to any decision-making process.

1.3. Structure

4. The Manual is organised as follows. Part I provides an introduction to the basic concepts, as covered in Chapter 1. Chapter 2 introduces the main purpose and principles behind the calculations of the indicators. Chapter 3 explains the criteria used to identify policies included in the calculation of the indicators, how to identify policy transfers according to recipient, and, finally, how to classify and label them.

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1. Alternating each year between the titles *Agricultural Policies in OECD Countries: Monitoring and Evaluation* and *Agricultural Policies in OECD Countries: At a Glance.*
5. Part II details the methodology for calculating the indicators. Chapter 4 explains the method to calculate transfers derived from policies that affect the market price received by producers of agricultural commodities. Chapter 5 focuses on other transfers, including budgetary payments to producers and support based on revenue foregone, e.g. tax or credit concessions. Chapters 6 and 7 show how to bring these transfers together to calculate the indicators of support to producers and consumers respectively. Chapter 8 details the calculation of indicators that measure support through general services to agriculture and the total support to agriculture. Chapter 9 explains the aggregation of support indicators across countries to obtain multi-country totals, e.g. at the OECD level. Chapter 10 concludes Part II by outlining the data and information requirements for calculating the indicators of support.

6. Part III shows how the indicators are used to analyse policy developments and in economic modelling. Chapter 11 explains how the indicators are used to interpret policy developments and what they can and cannot reveal, including appropriate wording and presentation (tables and graphs). These suggestions are neither absolute nor exhaustive, but are the result of many years of analysis, discussion and presentation of findings. Finally, Chapter 12 outlines how the indicator database is used in OECD agricultural policy modelling.
CHAPTER 2

OVERVIEW OF THE OECD INDICATORS OF AGRICULTURAL SUPPORT

7. This chapter begins with a brief summary of why the OECD indicators of agricultural support (“the indicators”) have been developed. The second section defines the indicators, and the final section outlines the underlying principles on which the indicators are established. Annex 2.1 reviews the historical development of the indicators.

2.1. Why measure agricultural support?

- The indicators were developed to monitor and evaluate developments in agricultural policy, to establish a firm base for policy dialogue among countries, and to provide economic data to assess the effectiveness and efficiency of policies.
- The indicators were mandated by OECD Ministers and calculated for OECD and several non-OECD countries, and are widely referred to in the public domain.

8. The objectives and priorities of agricultural policies in OECD countries have varied over time – from overcoming food shortages in the post-war period to securing food safety, environmental quality and preservation of rural livelihoods at present. Policy instruments have been equally varied, reflecting changes in domestic political and economic settings and, progressively, developments in the international economic arena. Despite this diversity, all policy measures can be brought together and expressed in one or several simple numbers – called support indicators – which are comparable across time and between countries. The utility of doing this is three-fold.

9. First, support indicators can be used to monitor and evaluate developments of agricultural policies. This includes the extent of policy reform achieved by countries, both over time and through specific reform efforts (e.g. the US Fair Act and various CAP reforms), as well as progress towards achieving the commitment agreed to at the OECD Ministerial Council of reforming agricultural policies. This commitment, made in 1982 by the OECD Ministerial Council, stated that “agricultural trade should be more fully integrated within the open and multilateral trading system” and it called for OECD countries to pursue “a gradual reduction in protection and a liberalisation of trade, in which a balance should be maintained as between countries and commodities.” Ministers also requested the OECD to develop a method to measure the level of protection in order to monitor and evaluate progress.

10. Closely related to this, the indicators establish a firm base for policy dialogue by using a consistent and comparable method to evaluate the nature and incidence of agricultural policies. While the indicators were calculated initially for OECD countries, the analysis has gradually included also non-OECD countries, including Brazil, China, Russia, South Africa and Ukraine. Consequently, the indicators are used for policy dialogue among OECD countries but also with non-OECD countries, intergovernmental organizations (such as the WTO, World Bank, IMF and FAO), farming and non-government organizations, as well as the research community.
11. Finally, the indicator database is used in further research on policy impacts. The data serve as an input into modelling to assess the effectiveness and efficiency of policies in delivering the outcomes for which they were designed and to understand their effects on production, trade, income, the environment, etc. While the indicators cannot by themselves quantify these impacts, the economic information upon which they are based is an important building block for further analysis.

2.2. Definitions and distinctions

- There is a set of indicators measuring support to agriculture, with each indicator estimating a specific aspect of support. Together they provide a comprehensive picture of agricultural support.
- Indicators can be distinguished according to the recipient of the transfer, the unit of measurement in which they are expressed, and the type of aggregation.
- Some support indicators are used to calculate other indicators; some are sub-sets or components of others.

12. Agricultural policies may provide direct payments to farmers. They may maintain domestic agricultural prices above those at the country’s border, or grant tax and credit concessions to farmers. Support is not only comprised of budgetary payments that appear in government accounts, but also includes support of market prices, as well as other concessions that do not necessarily imply actual budgetary expenditure. The common element to all these policies is that they generate transfers to the agricultural sector. The support indicators, introduced in the following chapters, are different ways to analyse these agricultural policy transfers and measure their levels in relation to various key economic variables.

13. The names, abbreviations and definitions of the indicators are listed in Box 2.1. No single indicator can capture all aspects of agricultural support. Each serves a purpose, capturing a dimension of the support framework. The indicators are interlinked and mutually reinforcing. When analysed together they provide a comprehensive picture of the level and composition of support.
Box 2.1. Names and definitions of the OECD indicators of agricultural support

**INDICATORS OF SUPPORT TO PRODUCERS**

**Producer Support Estimate (PSE):** the annual monetary value of gross transfers from consumers and taxpayers to agricultural producers, measured at the farm gate level, arising from policy measures that support agriculture, regardless of their nature, objectives or impacts on farm production or income.

**Percentage PSE (%PSE):** PSE transfers as a share of gross farm receipts (including support).

**Producer Nominal Assistance Coefficient (producer NAC):** the ratio between the value of gross farm receipts (including support) and gross farm receipts valued at border prices (measured at farm gate).

**Producer Nominal Protection Coefficient (producer NPC):** the ratio between the average price received by producers at farm gate (including payments per tonne of current output), and the border price (measured at farm gate).

**Single Commodity Transfers (SCT):** the annual monetary value of gross transfers from consumers and taxpayers to agricultural producers, measured at the farm gate level, arising from policy measures directly linked to the production of a single commodity such that the producer must produce the designated commodity in order to receive the transfer.

**Percentage Single Commodity Transfers (%SCT):** the commodity SCT as a share of gross farm receipts for the specific commodity.

**Group Commodity Transfers (GCT):** the annual monetary value of gross transfers from consumers and taxpayers to agricultural producers, measured at the farm gate level, arising from policy measures whose payments are made on the basis that one or more of a designated list of commodities is produced, i.e. a producer may produce from a set of allowable commodities and receive a transfer that does not vary with respect to this decision.

**All Commodity Transfers (ACT):** the annual monetary value of gross transfers from consumers and taxpayers to agricultural producers, measured at the farm gate level, arising from policy measures that place no restrictions on the commodity produced but require the recipient to produce some commodity of their choice.

**Other Transfers to Producers (OTP):** the annual monetary value of gross transfers from consumers and taxpayers to agricultural producers, measured at the farm gate level, arising from policy measures that do not require any commodity production at all.

**INDICATORS OF SUPPORT TO GENERAL SERVICES FOR AGRICULTURE**

**General Services Support Estimate (GSSE):** the annual monetary value of gross transfers to general services provided to agriculture as a sector (such as research, development, training, inspection, marketing and promotion), arising from policy measures that support agriculture regardless of their nature, objectives and impacts on farm production, income, or consumption. The GSSE does not include any transfers to individual producers.

**Percentage GSSE (%GSSE):** transfers to general services (GSSE) as a share of Total Support Estimate (TSE).

**INDICATORS OF SUPPORT TO CONSUMERS**

**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.

**Percentage CSE (%CSE):** CSE transfers as a share of consumption expenditure (measured at farm gate) 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) and that valued at border prices (measured at farm gate).

**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).

**INDICATORS OF TOTAL SUPPORT TO AGRICULTURE**

**Total Support Estimate (TSE):** the annual monetary value of all gross transfers from taxpayers and consumers arising from policy measures that support agriculture, net of the associated budgetary receipts, regardless of their objectives and impacts on farm production and income, or consumption of farm products.

**Percentage TSE (%TSE):** TSE as a share of GDP.
14. There are three distinctions that can be made between the indicators (Table 2.1). The first distinction relates to who is the intended recipient of the transfer – either producers individually, producers collectively, or consumers. These designations indicate the intended recipient of the transfer, although agriculture is always understood to be the economic sector supported by the policies (Section 3.1). For example, nine indicators measure support directed to producers individually, while two indicators measure support provided to producers collectively.

<table>
<thead>
<tr>
<th>Intended recipient</th>
<th>Unit of measurement</th>
<th>Percentage or ratio</th>
<th>Individual commodity or groups of commodities</th>
<th>Geographical</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Monetary</td>
<td></td>
<td></td>
<td>National(^1) (aggregate)</td>
</tr>
<tr>
<td>Producers individually</td>
<td>PSE</td>
<td>%PSE and producer NAC</td>
<td>nc</td>
<td>*</td>
</tr>
<tr>
<td></td>
<td></td>
<td>producer NPC</td>
<td>*</td>
<td>*</td>
</tr>
<tr>
<td></td>
<td>SCT</td>
<td>%SCT</td>
<td>*</td>
<td>*</td>
</tr>
<tr>
<td></td>
<td>GCT</td>
<td>nc</td>
<td>*</td>
<td>*</td>
</tr>
<tr>
<td></td>
<td>ACT and OTP</td>
<td>nc</td>
<td>nc</td>
<td>*</td>
</tr>
<tr>
<td>Producers collectively</td>
<td>GSSE</td>
<td>%GSSE</td>
<td>nc</td>
<td>*</td>
</tr>
<tr>
<td>Consumers</td>
<td>CSE</td>
<td>%CSE and consumer NAC</td>
<td>nc</td>
<td>*</td>
</tr>
<tr>
<td></td>
<td></td>
<td>consumer NPC</td>
<td>*</td>
<td>*</td>
</tr>
<tr>
<td>All recipients</td>
<td>TSE</td>
<td>%TSE</td>
<td>nc</td>
<td>*</td>
</tr>
</tbody>
</table>

Table 2.1. The OECD indicators of agricultural support

**nc:** not calculated

1. The European Union (EU) is treated as one country for the purpose of indicator calculations, given the common policy for agriculture applied throughout the Union, and specifically the EU12 for 1986-94 including ex-GDR from 1990; EU15 for 1995-2003; and EU25 from 2004.

15. A second distinction can be made in relation to unit of measurement: eight indicators are expressed in monetary terms and nine represent percentages or ratios. An advantage of monetary indicators is that they can be used to analyse the composition of support, e.g. to calculate the shares of PSE or GSSE by policy category, or the shares of TSE according to whether the transfers come from consumers or taxpayers. However, the monetary indicators are influenced by the size and structure of the country’s agricultural sector, as well as the country’s rate of inflation. Consequently, there are difficulties in using them to compare support levels between countries, to evaluate changes over time, or to assess the level of support provided within a country to different commodities. In contrast, percentage indicators and ratios, which relate policy transfers to monetary indicators, e.g. the value of agricultural production, allow such comparisons to be made.

16. Finally, the indicators can be distinguished according to the type of aggregation at which they can be derived — commodity or geographical level. While all the indicators can be calculated at the national and multi-country level, some can also be calculated for individual commodities or for groups of commodities.
2.4. What is measured and basic principles

- The purpose of the indicators is to measure the effort governments make in their agricultural policies. The indicators are not intended to and do not measure policy impacts on production, farm incomes, trade or environment.
- Several key principles determine the scope of policies included and the method for measuring support.
- These conceptual underpinnings are important to understand and interpret the indicators.

17. The indicators measure policy transfers to the agricultural sector. The phrase “from consumers and taxpayers” in the definition of the indicators points to the fact that they are primarily a measure of the cost of support for consumers and taxpayers. This implies that the indicators do not provide information on the “leakages” of support in the economic system. In fact, a proportion of the transfers will not end up as producer income because support induces higher prices for agricultural inputs and factors, as well as generating deadweight loss. The actual impact of policies will depend, among other things, on the basis upon which support is provided, the level of support, and the responsiveness of farmers to changes in support. The indicators, therefore, measure the policy effort that governments make in their agricultural policies. They are not intended to and do not measure the impact of that effort on farm incomes, trade or environment. The concept of policy effort underlying the indicators is crucial for proper interpretation of the estimates.

18. A number of principles, or general rules, guide the measurement of agricultural support. Principles 1 to 3 determine the scope of policy measures to be considered in estimating agricultural support and provide criteria for identifying agricultural policies in a complex mix of government actions. Principles 4 and 6 help define the method for measuring support and are important for interpreting the indicators.

19. **Principle 1: generation of transfers to agricultural producers as a key criterion for inclusion of policy in the measurement of support.** Policy measures generate explicit or implicit transfers to supported individuals or groups. A policy measure is considered for measurement if agricultural producers, individually or collectively, are the only, or the principal, recipients of economic transfers generated by it. This is sufficient criterion for inclusion of a policy measure in the estimation of agricultural support.

20. **Principle 2: there is no consideration of the nature, objectives or economic impacts of a policy measure beyond an “accounting” for transfers.** This principle complements principle 1, in that the stated objectives, or perceived economic impacts of a policy measure, are not used as alternative or additional criteria to determine the inclusion or exclusion of a policy measure in the estimation of agricultural support.

21. **Principle 3: general policy measures available throughout the entire economy are not considered in the estimation of agricultural support,** even if such measures create policy transfers to/from the agricultural sector. Thus, a situation of zero support to agriculture would occur when there are only general economy-wide policies in place with no policies specifically altering the economic conditions for agriculture.

22. **Principle 4: gross transfers generated by agricultural policies are measured.** Policy transfers can be defined in gross or net terms, *i.e.* as revenue (gross receipts) or income (revenue less costs) generated by a policy measure. The phrase “gross transfers” in the definitions emphasises that no adjustment is made in the indicators for costs incurred by producers in order to receive the support, *e.g.* costs to meet compliance conditions attached to certain payments.
23. Principle 5: policy transfers to individual producers are measured at the farm gate level, which follows from the objective to measure support only to primary producers of agricultural commodities. Consequently, the word “consumer” in the definitions and methodology is understood as a first-stage buyer of agricultural commodities.

24. Principle 6: policy measures supporting individual producers are classified according to implementation criteria, i.e. depending on the basis upon which support is provided. These policy characteristics affect producer behaviour and distinguishing policies according to implementation criteria enables further analysis of policy impacts on production, trade, income, the environment, etc.

25. These are the general principles applied in estimating the indicators of support. Along with the more practical underpinnings of the methodology they will be developed further in the following chapters.
Annex 2.1.

A Short History of the Indicators

26. The widespread policy goal from the late 1940s to produce more food led to increasing concern about the effects of agricultural policies on trade relations and on the cost of policies. Combined with rapid technical progress and structural changes, trade barriers and domestic production support measures led to surpluses of farm goods, which were stocked or exported with additional subsidies. World prices for temperate zone commodities were driven down. The costs of stock holding and export subsidies placed heavy burdens on government budgets, consumers in countries with protected markets faced higher food bills, and competitive producers in other countries were penalised by restrictions on access to those markets. By the beginning of the 1980s, a number of OECD countries realised that action was urgently needed.

27. At the 1982 OECD Ministerial Council (consisting of Ministers of Economics, Trade and Foreign Affairs, plus a few Agriculture Ministers), it was agreed “that agricultural trade should be more fully integrated within the open and multilateral trading system…(and) that the desirable adjustments in domestic policies can best take place if such moves are planned and co-ordinated within a concerted multilateral approach aimed at achieving a gradual reduction in protection and a liberalisation of trade, in which a balance should be maintained as between countries and commodities.” Ministers also decided that the Secretariat should “study the various possible ways in which the above aims could be achieved as a contribution to progress in strengthening co-operation on agricultural trade issues and as a contribution to the development of practical multilateral and other solutions.”

28. An integral part of this investigation was to develop an appropriate basis for measuring agricultural subsidies. After considering the options available, the Secretariat decided to use the Producer Subsidy Equivalent (PSE), initially defined as the payment that would be required to compensate farmers for the loss of income resulting from the removal of a given policy measure (OECD, 1987). While the PSE was at first used for modelling the effects on world commodity prices of a small (10%) reduction in agricultural subsidies, it was also recognised as a very useful tool in its own right to establish a consistent and comparative method to evaluate agricultural policies between countries.

29. The notion of a “subsidy equivalent” derives from the economic theory of protection developed in the 1960s to evaluate the effects of tariffs (Corden, 1971). According to this theory, the producer subsidy equivalent of a policy measure, whether an import tariff, export subsidy, payment per tonne or per hectare, etc., is the payment per unit of output that a government would have to pay producers to generate the same impact on production as that policy measure. In the early 1970s, Tim Josling applied this concept to the empirical measurement of agricultural subsidies in work for the FAO, introducing the term PSE (Josling, 1973 and Josling, 1975).

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2. The Consumer Subsidy Equivalent (CSE) was defined as “the implicit tax on consumption resulting from a given policy measure (market price support element of the PSE) and any subsidies on consumption.”

3. Likewise, the consumer tax equivalent of a policy measure is the per unit tax that a government would have to impose to generate the same impact on consumption as that policy measure.
30. In 1987, a major OECD study entitled *National Policies and Agricultural Trade* offered an in-depth analysis of the agricultural policies of individual OECD countries based largely on the PSE and related indicators. This study recognised the linkages between domestic and trade policies and concluded that in order to improve the trading environment actions were necessary on both trade barriers and domestic policies.

31. It was clear from the start that the “income compensation” definition did not match what was actually being measured by the OECD PSE. While policy measures providing the same amount of *monetary* transfers to producers have the same *revenue* subsidy equivalent, they may have different production and income subsidy equivalents which depend on the way measures are implemented (per unit of output or per hectare of land producing the same output, for example). One of the first critiques in this regard noted, *inter alia*, that the PSE was a measurement of revenue transfer (Peters, 1988).

32. As a result, the PSE was redefined in 1990 as the *annual monetary value of gross transfers from consumers and taxpayers to agricultural producers, measured at the farm-gate level, arising from policy measures that support agriculture, regardless of their nature, objectives or impacts on farm production or income.*

33. Four major refinements were made in 1999:

- The PSE acronym was changed from meaning “Producer Subsidy Equivalent” to “Producer Support Estimate”. It was recognised that: (a) transfers associated with a wide range of diverse policies have different “subsidy equivalents”; and (b) that some of the transfers were given for the provision of services and positive externalities rather than to subsidise the production of agricultural commodities. The more neutral term “support” acknowledges that a monetary transfer is involved whatever the policy objective.

- Changes were made to the classification of policies within the PSE (Table A2.1). This was required because of the growing scope of support policies introduced since the mid-1980s. Previously, there were five PSE categories with policies classified according to the *type* of support measure. The 1999 refinements introduced seven types of support measures with policies classified according to how they were *implemented*.

- A closely related change involved the establishment of a separate indicator to measure support provided to producers collectively, the General Services Support Estimate (GSSE). Support for “General Services” was previously included in the PSE. This was separated from the calculation of the PSE, which at present measures only support received by producers individually. Consequently, the indicator and method for measuring the total cost to consumers and taxpayers of agricultural policies also changed, from the Aggregate Subsidy Equivalent (ASE) to Total Support Estimate (TSE).

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4. PSEs and CSEs were initially calculated for a set of OECD countries comprising Australia, Austria, Canada, the EEC, Japan, New Zealand and the United States for the period 1979 to 1981, and later extended to include Sweden, Finland, Norway and Switzerland.

5. The CSE was also redefined as *the annual monetary value of gross transfers to consumers of agricultural commodities, measured at the farm gate level, arising from policies that support agriculture, regardless of their nature, objectives or impacts on consumption of farm products*. If negative, the CSE measures the burden (implicit tax) on consumers, indicating that higher prices resulting from market price support more than offset consumer subsidies.

6. The CSE was changed from the “Consumer Subsidy Equivalent” to the “Consumer Support Estimate”.

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Finally, a new method for calculating the national (aggregate) PSE was introduced. Previously, this was calculated by “extrapolating” the average %PSE for a common set of thirteen commodities to all agricultural production. A new method was introduced whereby only the average ratio of MPS to gross farm receipts for a set of commodities is extrapolated across to the rest of agricultural production, with all transfers from non-MPS policies included specifically within the PSE through classification in the appropriate categories.

Further changes were introduced in 2007 to enable the indicators to better capture recent policy developments, e.g. the move to “decouple” the provision of support from specific commodity production and “re-couple” the provision of support to other criteria. Three major changes were made:

- Although still based on implementation criteria, the PSE categories were substantially redefined (section 3.3.1).
- Labels were introduced with the result that each policy in addition to being classified into a PSE category would also have six different labels attached to it so as to provide further detail on implementation criteria (section 3.3.3).
- PSEs for individual commodities are no longer calculated. Instead, a country total PSE is divided into Single Commodity Transfers, Group Commodity Transfers, All Commodity Transfers; and Other Transfers to Producers (section 6.3).

### Table A2.1. Development of PSE categories

<table>
<thead>
<tr>
<th>Initial 1987 categories</th>
<th>1999 revision</th>
<th>2007 revision</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. Market Price Support</td>
<td>A. Market Price Support</td>
<td>A. Support based on commodity output (Market Price Support and Payments based on output)</td>
</tr>
<tr>
<td>B. Direct payments</td>
<td>B. Payments based on output</td>
<td>B. Payments based on input use</td>
</tr>
<tr>
<td>C. Reduction in input costs</td>
<td>C. Payments based on area planted/animal numbers</td>
<td>C. Payments based on current A/An/R/I(^1), production required</td>
</tr>
<tr>
<td>D. General Services</td>
<td>D. Payments based on historical entitlements</td>
<td>D. Payments based on non-current A/AN/R/I, production required</td>
</tr>
<tr>
<td>E. Other</td>
<td>E. Payments based on input use</td>
<td>E. Payments based on non-current A/AN/R/I, production not required</td>
</tr>
<tr>
<td></td>
<td>F. Payments based on input constraints</td>
<td>F. Payments based on non-commodity criteria</td>
</tr>
<tr>
<td></td>
<td>G. Miscellaneous</td>
<td>G. Miscellaneous</td>
</tr>
</tbody>
</table>

1. The letters stand for Area, Animal Numbers, Receipts and Income.
CHAPTER 3.
IDENTIFYING, DISTINGUISHING AND CLASSIFYING POLICIES

35. Before calculating the indicators for any particular country, it is important to fully understand the range of policy measures applied to support agriculture and the form in which they are implemented.

36. The first section of Chapter 3 defines the policy measures included in the measurement of support. The following section differentiates the policies according to which of the three economic groups the transfer is made to. The third section details the various categories and labels attached to policy measures within the PSE, including definitions and worked examples. Similarly, the various GSSE and CSE categories are defined and discussed in the two final sections.

3.1. Identifying policies that support agriculture

- Policies are included in the estimates of support if agriculture is the only, or the major, beneficiary of the policy.
- It does not matter which government ministry or level of government implements the policy.

37. The range of policy measures included in the estimation of agricultural support are determined by the definitions and principles outlined in Chapter 2. In all cases, which government body is responsible for the policy measure giving rise to the transfer has no impact on the decision to include it or not. In other words, policy measures supporting agriculture may be under the responsibility of many different government ministries, and not just the ministry responsible for agriculture, and at different levels of government, e.g. central, provincial, prefectural or state. Alternatively, policies implemented by a Ministry responsible for agriculture but related to non-agricultural activities, e.g. forestry or fisheries, are not considered.

38. From the definition of the PSE, a policy measure will be included in the estimation of agricultural support if it: (a) provides a transfer whose incidence is at the farm level; and (b) is directed specifically to agricultural producers or treats agricultural producers differently from other economic agents in the economy. The support provided by the policy measure may be delivered in several different ways: an increased output price (market price support); a reduced input price (e.g. a fertiliser subsidy); a direct payment (a cheque from the government); a revenue foregone (e.g. a tax credit); a reimbursement of a tax or charge (e.g. as for fuel taxes in some countries); or a gratuitous service in kind (e.g. delivery of extension services to individual farmers).

39. The inclusion of price support or direct payments based on agricultural production or agricultural area is without ambiguity as to the specificity of the measure or its incidence at farm level. A payment reducing the price of fertiliser or pesticide for application on working farm land is clearly agricultural and producer specific and is included in the PSE. On the other hand, a tax concession that is available to all small businesses or to all self-employed people in an economy would not be included in the PSE because it is not specific, even though it benefits farmers.

40. With respect to some measures, a degree of judgement needs to be exercised. This is illustrated in the following examples.
• A fertiliser subsidy may benefit gardeners and owners of golf courses, but the main beneficiary will usually be farmers. In this case, the policy measure is judged to be specific to farming and is included in the PSE. However, in the estimation of support only the value of transfers going to agriculture is included.

• Many countries grant concessions on the use of fuel in machines for off-road use. All machinery-using sectors may benefit or a limited number of sectors may be defined by the enabling regulations. In these cases, the benefit will be included in the PSE if agriculture is singled out as a target sector for the benefit or if, de facto, it is the major beneficiary of the measure.

• A grant for the conversion of farm buildings to self-catering accommodation for tourists will not be included unless eligibility for the grant is confined to farmers.

• By convention, differential treatment of farmers in social security measures is not included because it has not been possible to determine whether benefits are conferred that are specific to primary agriculture.

• Measures that provide support to individuals who may not be farmers to carry out actions on farms, e.g. a stone wall payment/environmental measure that is also available to non-farmers. This is included, although only the value of transfers going to farmers is included.

41. The definition of the GSSE allows for a wider range of policy measures to be included in the indicator. As with the PSE, the focus is on the primary sector – agricultural production at the level of the farm. Two principal types of expenditures are included as follows:

• Expenditures associated with policy measures that are included in the PSE, but which are not received directly by farmers. For example, the costs associated with the storage and disposal of price supported commodities by the government or an appointed agency is included in the GSSE.

• Services that benefit primary agriculture but whose initial incidence is not at the level of individual farmers. For example, agricultural education, research, marketing and promotion of agricultural goods, general infrastructural investment relating to drainage, and irrigation, and inspection services beyond the farm gate.

42. From the definition of the CSE, policy measures which provide positive transfers to first consumers of agricultural commodities, e.g. flour mills, meat processing plants or fruit packing houses, are also included when they are provided specifically to offset the higher prices that result from market price support. Domestic food aid associated with measures that support agriculture, e.g. distribution of government stocks acquired in the context of market interventions, are also included.

43. A continual effort is made to ensure consistency in the treatment and completeness of policy coverage. Revising the calculations and improving consistency in light of more updated data and information on policy measures is an ongoing process undertaken in conjunction with the preparation of the reports on Agricultural Policies in OECD Countries: Monitoring and Evaluation and Agricultural Policies in Non-OECD Countries: Monitoring and Evaluation.
3.2. **Distinguishing between policies according to economic group**

- Policy measures are attributed to three economic groups on the basis of who receives the transfer, *i.e.* producers individually, producers collectively, or consumers of agricultural commodities.
- A series of questions help to determine to which group a policy transfer should be classified.

44. Identifying the full range of policies supporting agriculture is also largely a process of distinguishing between policy measures on the basis of which economic group receives the transfer. Three economic groups are identified: does the policy measure provide transfers to producers individually (PSE); transfers to consumers individually (CSE) or transfers to producers collectively as general services to agriculture (GSSE)? Appropriately distinguishing between policies is important for correctly calculating the indicators that measure the level and composition of support. This process can be aided by the following sequence of questions.

**Question 1**: Does the policy create a transfer to producers collectively though general services?

45. Such transfers do not depend on the actions of individual farmers or consumers, are not received by individual producers or consumers, and do not affect directly farm receipts or consumption expenditure. In answering this question it would be useful to bear in mind the categories for classifying policies within the GSSE (section 3.4). If the answer is yes, consider the policy under the GSSE. If no, proceed to the next question.

**Question 2**: Does the policy measure create a transfer to producers individually based on goods or services produced, on inputs used or on the fact of being a farming enterprise or farmer?

46. For a policy measure to be included in the PSE it is necessary that an individual farmer take actions to produce goods or services, to use factors of production, or to be defined as an eligible farming enterprise or farmer, to receive the transfer. If yes, consider it under the PSE and proceed to the following question. If no, also proceed to the following question.

**Question 3**: Does the policy create a transfer to or from consumers of agricultural commodities?

47. In the case of the CSE, it is necessary for individual consumers to take actions to consume agricultural commodities to receive (provide) a transfer. Examples of policies grouped in the CSE include transfers to processors (first consumers) to compensate them for higher domestic prices and consumption subsidies in cash or in kind to support consumption levels. Note also that some policies that are grouped in the PSE also constitute the CSE. These relate to the policies that create price based transfers. A border tariff creates a price gap between domestic and world prices, resulting in consumers paying a higher price for that product. This policy measure results in transfers from consumers to producers and from consumers to government revenue (Sections 4.2 and 4.3 explain this in greater detail). If yes, consider it under the CSE.

48. The TSE represents the sum of all three components, adjusted for double-counting given that the transfers associated with some policies appear in both the PSE and CSE calculation.
3.3. Classifying and labelling policies that support producers individually (PSE)

- Policy measures included in the PSE are classified and labelled according to specific implementation criteria. These identify the economic features of policy measures, important for understanding potential impacts of policies on production, consumption, trade, income, and the environment.
- Policy measures are classified into seven categories which identify the transfer basis for the policy, whether the basis is current or non-current, and whether production is required or not.
- Labels are also given to each policy measure. They provide information on whether constraints are placed on output levels or input use, whether the payment rate is variable or fixed, and are more specific on the target of the policy transfer.

3.3.1. Definition of categories and sub-categories

49. The impact of policy measures on variables such as production, consumption, trade, income, employment and the environment depend primarily on the way policy measures are implemented. Therefore, to be helpful for policy analysis, policy measures to be included in the PSE are classified according to implementation criteria. 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. However, these conditions are often multiple. Thus, the criteria used to classify payments to producers are defined in a way that facilitates: the analysis of policies in the light of the “operational criteria” defined by OECD Ministers of Agriculture in 1998; the assessment in subsequent analysis of their impacts on production, consumption, income, employment, etc., through, for example, the Policy Evaluation Model (PEM); and the classification of policy measures in a consistent way across countries, policy measures and over time.

50. Policy measures with an environmental focus illustrate the role of implementation criteria in the PSE classification. Possible agri-environmental payments include cost-sharing for the installation of conservation practices, or alternatively the provision of a per hectare payment to incite an above-standard level of environmental condition. Although in both cases the payments may have the same environmental objective, their main implementation criteria are not the same, and therefore the incentives provided to farmers in terms of resource use and production decisions differ. Hence, the two cases should not be considered under the same category.

51. As a result of several policy developments including policy reform initiatives and new measures of support, a new PSE classification was introduced in 2007. The key underlying principle remains that policy measures are classified according to the way they are implemented. The various categories and sub-categories listed in Box 3.1 have been constructed to identify the implementation criteria that are considered to be the most significant from an economic perspective and reflecting policies applied in OECD countries. The categories identify:

- The transfer basis for support: output (category A), input (category B), area/animal numbers/receipts/incomes (categories C, D and E), non-commodity criteria (category F);
- Whether the support is based on a current (categories A, B, C, F) or non-current (historical or fixed) basis (categories D and E);
- Whether production is required (categories C and D) or not (category E).
Box 3.1. Names and definitions of the PSE categories and sub-categories

A. Support based on commodity output
   
   **A.1. Market price support (MPS):** transfers from consumers and taxpayers to agricultural producers arising from policy measures that create a gap between domestic market prices and border prices of a specific agricultural commodity, measured at the farm gate level.

   **A.2. Payments based on output:** transfers from taxpayers to agricultural producers from policy measures based on current output of a specific agricultural commodity.

B. Payments based on input use: transfers from taxpayers to agricultural producers arising from policy measures based on on-farm use of inputs:

   **B.1. Variable input use** that reduces the on-farm cost of a specific variable input or a mix of variable inputs.

   **B.2. Fixed capital formation** that reduce the on-farm investment cost of farm buildings, equipment, plantations, irrigation, drainage and soil improvements.

   **B.3. On-farm services** that reduce the cost of technical, accounting, commercial, sanitary and phyto-sanitary assistance, and training provided to individual farmers.

C. Payments based on current A/An/R/I, production required: transfers from taxpayers to agricultural producers arising from policy measures based on current area, animal numbers, receipts or income, and requiring production. Category C is further broken down to three sub-categories according to commodity specificity:

   **C.1. Of a single commodity** – including transfers through policies related to a single commodity;

   **C.2. Of a group of commodities** – including transfers through policies related to a group of commodities;

   **C.3. Of all commodities** – including transfers through policies related to all commodities.

D. Payments based on non-current A/An/R/I, production required: transfers from taxpayers to agricultural producers arising from policy measures based on non-current (i.e. historical or fixed) area, animal numbers, receipts or income, with current production of any commodity required.

E. Payments based on non-current A/An/R/I, production not required: transfers from taxpayers to agricultural producers arising from policy measures based on non-current (i.e. historical or fixed) area, animal numbers, receipts or income, with current production of any commodity not required but optional. Category E is further divided in two sub-categories according to the nature of payment rates used:

   **E.1. Variable rates:** transfers using payments rates which vary with respect to levels of current output or input prices, or production/yields and/or area.

   **E.2. Fixed rates: transfers** using payments rates which do not vary with respect to these parameters.

F. Payments based on non-commodity criteria: transfers from taxpayers to agricultural producers arising from policy measures based on:

   **F.1. Long-term resource retirement:** transfers for the long-term retirement of factors of production from commodity production. The payments in this subcategory are distinguished from those requiring short-term resource retirement, which are based on commodity production criteria.

   **F.2. A specific non-commodity output:** transfers for the use of farm resources to produce specific non-commodity outputs of goods and services, which are not required by regulations.

   **F.3. Other non-commodity criteria:** transfers provided equally to all farmers, such as a flat rate or lump sum payment.

G. Miscellaneous payments: transfers from taxpayers to farmers for which there is a lack of information to allocate them among the appropriate categories.

1. The abbreviations represent: A – Area; An – Animal numbers; R – Receipts; and I - Income
3.3.2. Classification criteria

52. The criteria for classifying each of the policy measures included in the PSE into a specific category, as defined in the PSE classification, are expressed through the following sequence of questions. These criteria are mutually exclusive and are applied to each policy measure sequentially. Although a given policy measure may be conditional on several of the criteria, it is classified under the first applicable criterion. If a transfer to agricultural producers provided through two (or more) policy measures is available only as an aggregate amount, a suitable allocation key is used to allocate it to the appropriate categories.

**Question 1:** Does the policy measure provide an implicit or explicit transfer to individual producers on the basis of commodity criteria (i.e. dependent on the output, area, animal numbers, receipts or income of commodities currently or formerly produced, or the inputs used to produce them)?

**YES:** go to the next question

**NO:** go to question 11

**Question 2:** Does the policy measure provide a transfer to agricultural producers that is conditional and based on current commodity output?

**YES:** consider it under *A. Support based on commodity output* and go to the next question

**NO:** go to question 4

**Question 3:** Does the policy measure affect the domestic market price for consumers and producers of a specific commodity?

**YES:** consider it under *A.1 Market price support*

**NO:** consider it under *A.2 Payments based on output*

**Question 4:** Does the policy measure provide an explicit or implicit payment to individual producers using a specific input, or group of inputs, to produce agricultural commodities?

**YES:** consider it under *B. Payments based on input use* and go to the next question

**NO:** go to question 7

**Question 5:** Does the policy measure reduce the on-farm cost of a single, or a set of, variable inputs (fertilisers, pesticides, animal feed, seeds, water, energy, hired labour, etc.), the maintenance and operation costs of capital (plant, machinery, buildings, etc.), or other variable costs (interest concessions on loans for the purchase of variable inputs, insurance premiums, etc.)?

**YES:** consider it under *B.1. Payments based on variable input use*

**NO:** go to the next question

**Question 6:** Does the policy measure reduce the on-farm investment cost of fixed capital (e.g. farm buildings, equipment, plantations, soil improvement, drainage and irrigation), including interest concessions on investment loans?
YES: consider it under B.2. Payments based on fixed capital formation

NO: consider it under B.3. Payments based on on-farm services

**Question 7:** Does the policy measure provide a payment to agricultural producers conditional on planting crop(s) or on maintaining a herd of livestock, and based on the current area (A), animal numbers (An), receipts (R), or income (I) of a single commodity, a specific group of commodities, or all commodities?

YES: consider it under **C. Payments based on current A/An/R/I, production required**, of a single commodity (C.1), a group of commodities (C.2), or all commodities (C.3)

NO: go to the next question

**Question 8:** Does the policy measure provide a payment to agricultural producers conditional on **planting** a crop or on **maintaining** a herd of livestock, and based on the non-current (past or fixed) A/An/R/I of a single commodity, a specific group of commodities, or all commodities?

YES: consider it under **D. Payments based on non-current A/An/R/I, production required**

NO: go to the next question

**Question 9:** Does the policy measure provide a payment to agricultural producers on condition that their land remains in the agricultural sector, and based on non-current (historical or fixed) A/An/R/I of a single commodity, a specific group of commodities, or all commodities but not required to produce commodities?

YES: consider it under **E. Payments based on non-current A/An/R/I, production not required** and go to the following question

NO: go to question 11

**Question 10:** Is the payment defined as a variable rate *(i.e. dependent on a variation of output or input prices)*?

YES: classify under **E.1 variable rate**

NO: classify under **E.2 fixed rate**

**Question 11:** Does the policy measure provide an implicit or explicit transfer to individual producers on the basis of non-commodity criteria *(i.e. independent of the output, area, animal numbers, receipts or income of commodities currently or formerly produced, or the inputs used to produce them)*?

YES: consider it under **F. Payments based on non-commodity criteria** and proceed to the following question

NO: classify provisionally under **G. Miscellaneous payments**, and try to get more information how the policy is implemented.7

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7. This category should be considered as provisional and contain only a marginal amount of payments. Efforts should be made to fill the information gaps and classify these transfers in categories A-F.
**Question 12:** Does the policy measure require the long-term retirement of factors of production from commodity production (e.g. retirement of land from production, permanent reduction in milk production, afforestation or destroying trees in orchards or vineyards)?

YES: consider it under **F.1. Payments based on long-term resource retirement**

NO: go to the next question

**Question 13:** Does the policy measure require the use of farm resources to produce specific non-commodity outputs (e.g. to plant hedges or build stone walls), which can be considered as either goods produced (hedges, stone walls) or services provided (e.g. protecting biodiversity or improving the countryside)?

YES: consider it under F.2. Payments based on a specific non-commodity output

NO: consider it under F.3. Payments based on other non-commodity criteria

### 3.3.3. Definition of labels

53. In addition to a category classification, each policy measure is assigned six labels that provide additional details on policy implementation (Box 3.2). Like the PSE categories, labels are defined in terms of implementation criteria rather than policy objectives. The six labels available in the database provide information on the constraints placed by policies on output levels or input use, refine the target of the policy transfer, and identify the source of the transfer. The alternatives offered by each label are exhaustive, so that only one of the available options can be attributed to a payment.

54. For practical purposes labels are presented as such but could theoretically be presented as sub-subcategories. For example, in PSE category E, the “with variable or fixed payment rates” label is used to create sub-categories E.1 and E.2. Similarly, in PSE category C, the label concerning commodity specificity (whether a payment based on a single commodity, a group of commodities, or all commodities) is used to create sub-categories C.1, C.2 and C.3. Other labels could in the future be presented as subcategories if policy developments warrant the change. In designing the structure of the PSE database, the choice between treating a particular implementation criterion as a sub-category or a label is one of relative importance and pragmatism, rather than a conceptual difference between these two options.

55. The label “with/without L” relates, for example to production quota associated with policy measures in Category A, or land set-aside associated with policy measures in Category C. The label refers to restrictions on production activities and not limits on payment. For example, a programme that provides an area payment for at the most 10 hectares is not labelled as having a production limit even though payments cease beyond a certain level of production.

56. All PSE transfers, except those in Category A.1, can be provided under the condition that farmers respect certain production practices considered as environmental or animal welfare friendly, or addressing food safety or other societal concerns (cross compliance). Restrictions or obligations on using inputs as part of a generally applicable regulation do not constitute input constraints under this definition.

57. An interest concession or capital grant can be provided: (a) for any on-farm production investment for any purpose; or (b) only for on-farm manure treatment facilities for an environmental purpose, or to contribute to investment costs of farmers in less favoured areas, or to improve the conditions in which animals are kept. In all of these cases, the concessions or grants are linked to input use associated with commodity production, and are thus classified in Category B.2. Payments based on fixed capital formation. However, in the case of (a) this is generally applied and thus without constraints, while in the
case of (b) there are constraints as to the specific use of inputs, despite the fact that each payment is granted to achieve different objectives.

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**Box 3.2. Names and definitions of the PSE labels**

- **With or without current commodity production limits (with/without L):** defines whether or not there is a specific limitation on current commodity production (output, area or animal numbers) that is eligible to receive payments or MPS. Applied in categories A – D.

- **With variable or fixed payment rates (with F/V rates):** defines whether payments rates vary with respect to levels of current output or input prices or production/yields and/or area (variable rates); or do not vary with respect to these parameters (fixed rates). Applied in categories A – D (in E it is a specific subcategory).

- **With or without input constraints (with/without L):** defines whether or not there are specific requirements for the reduction, replacement, or withdrawal in the use of inputs for commodity production eligible to receive payments. Applied in categories A – F.

- **Based on area, animal numbers, receipts or income (based on A/An/R/I):** defines the specific attribute (i.e. area, animal numbers, receipts or income) on which the payment is based. Applied in categories C – E.

- **Based on a single commodity, a group of commodities or all commodities (based on SC/GC/AC):** defines whether the payment is granted for production of a single commodity, a group of commodities or all commodities. Applied in categories A, B and D (in C it is a specific subcategory).

- **With or without commodity exceptions (with/without E):** defines whether or not there are prohibitions upon the production of certain commodities as a condition of eligibility for payments based on non-current A/An/R/I of commodity(ies). Applied in Category E.

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**3.3.4. Worked examples**

58. The examples that follow illustrate how the criteria in sub-section 3.3.2 are used to classify policy measures into the various PSE categories and sub-categories, and which labels are attached to the policy. The examples start directly with Category A.2 (Payments based on output), since market price support policies (Category A.1) are explained in Chapter 4 in considerable detail.

59. For each policy measure it is understood that the questions preceding its assignment to that category are answered consistently with its assignment. So for example, a policy measure classified in category B.1 (Payments based on variable input use) entails answering “yes” to question 5, but to reach question 5 one must answer “yes” to questions 1 and 2, “no” to question 3, and “yes” to question 4. For reasons of space the answers to each preceding question are not listed for the examples; however, where necessary comments on classification are introduced.
### Table 3.1. Worked examples of PSE categories and labels

<table>
<thead>
<tr>
<th>Categories</th>
<th>Labels</th>
</tr>
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<tbody>
<tr>
<td>With or without current commodity production limits</td>
<td>With or without current commodity production limits</td>
</tr>
<tr>
<td>With variable or fixed payment rates</td>
<td>With variable or fixed payment rates</td>
</tr>
<tr>
<td>With or without input constraints</td>
<td>With or without input constraints</td>
</tr>
<tr>
<td>Based on area, animal numbers, receipts or income</td>
<td>Based on area, animal numbers, receipts or income</td>
</tr>
<tr>
<td>Based on a single commodity, a group of commodities or all commodities</td>
<td>Based on a single commodity, a group of commodities or all commodities</td>
</tr>
<tr>
<td>With or without commodity production exceptions</td>
<td>With or without commodity production exceptions</td>
</tr>
<tr>
<td>with/without L</td>
<td>with V/F rates</td>
</tr>
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</table>

### A.2. Payments based on output

#### Agricultural Stabilization Act (Canada)

Payments are made on a per tonne basis according to a participating producer's eligible grain sales. Payment is calculated by multiplying marketed quantities by the difference between the current market price and 90% (or some other level) of the average market price of the previous five years adjusted for changes in costs relative to the average costs in the previous five years. It is labelled a "variable" payment rate because the level of payment is determined by fluctuations of market price. Payments are labelled to single commodities.

#### Loan deficiency payments (US)

Payments are made on a per tonne basis to producers eligible for price support loans who agree to forgo the loan. The payment is the difference between the loan rate and the domestic market price, multiplied by the quantity of each specific commodity for which the loan deficiency payment is requested, or otherwise eligible for on a crop year basis. It is labelled a "variable" payment rate as the level of payment is determined by fluctuations of market price. Payments are subject to input constraints under the conservation compliance.

#### Milk Price Supplement for Cheese Production* (Switzerland)

Payment per tonne of milk granted to farmers delivering milk to cheese producers. As this payment is made for milk within a production quota, it is labelled with current production limits.

### B.1. Payments based on variable input use

#### Fuel tax rebates³

Tax exemptions on diesel for farmers relative to the standard tax rate on diesel. As the amount of the rebate changes when the price of fuel changes, these programmes are labelled as having "variable" payment rates. They are also labelled as being "without" input constraints. To be labelled as "with" input constraints, a limit on total fuel use on farm would have to be in place. Since it is available to all producers, it is labelled as supporting all commodities.

#### Irrigation subsidy (Mexico)

Reduced electricity rates are set for groundwater pumping in agriculture. As the discount is fixed, the subsidy is labelled as a "fixed" rate. No limits on current production or constraints on water use are set as eligibility conditions. All farmers are eligible for preferential electricity tariffs, and so the subsidy is labelled as being available for all commodities.

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1. na: Not applicable
2. SC: Based on area
3. GC: Based on a group of commodities
4. AC: Based on all commodities
### B.2. Payments based on fixed capital formation

<table>
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<tr>
<th>Categories</th>
<th>Labels</th>
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<tbody>
<tr>
<td>With or without current commodity production limits</td>
<td>With variable or fixed payment rates</td>
</tr>
<tr>
<td>With or without input constraints</td>
<td>Based on area, animal numbers, receipts or income</td>
</tr>
<tr>
<td>Based on a single commodity, a group of commodities or all commodities</td>
<td>With or without commodity production exceptions</td>
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</table>

#### Interest concessions
(e.g. EU countries)

Subsidising interest rates provides support to producers for building up their capital stock. The level of subsidy changes as a result of movements in market interest rates (the reference interest rate for calculating the level of the concession provided) and so it is labelled as “variable” payment rate. Since it is available to all producers, it is labelled as supporting all commodities.

#### Capital grants for on-farm infrastructure
(Japan)

Budgetary allocations for the on-farm infrastructure improvement scheme, including construction of irrigation and drainage facilities and land re-parcelling. The assistance is provided without production limits or constraints on input use. As the amount of payment does not change with the variation of current output, prices, or current production costs, it is labelled as a “fixed” payment rate. Since the payment available to all producers it is labelled as supporting all commodities.

#### Property tax exemptions
(Canada – provincial governments)

Provides an implicit payment to producers proportional to the value of their property, intended as agricultural capital. As the implicit payment depends on the amount of land only, it is labelled as having “fixed” payment rates. Since it is available to all producers, it is labelled as supporting all commodities.

### B.3 Payments based on on-farm services

#### Extension and advisory services
(e.g. Australia, Iceland, Japan, Korea, Mexico)

Federal and provincial expenditures for the activities related to the provision of information, training and services directly to farmers. This category also includes technical assistance component of other programmes, such as for example, conservation programmes.

#### Pest and disease control

The slaughtering of animals for disease-related concerns falls under this category, for example. Such payments are labelled as “without” input constraints as the destruction of livestock is not a constraint on the amount of or use to which (non-slaughtered) animals may be put.

#### FarmBis (Australia)

Provides financial support to assist farmer participation in learning activities to improve the management of their business, natural and human resources. It is available to eligible farmers independently of the commodities they produce and so is labelled as supporting all commodities.
<table>
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<th>Categories</th>
<th>Labels</th>
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<tbody>
<tr>
<td>With or without current commodity production limits</td>
<td>With variable or fixed payment rates</td>
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<td>with/without L</td>
<td>with V/F rates</td>
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### C.1. Payments based on current A/An/R/I of a single commodity, production required

**Crop insurance payments (Canada)**

Government contribution to a voluntary crop insurance scheme which covers between 70% and 90% of average yield (depending on the crop and province) over a 10 to 15 year period. Farmers finance one half of the scheme but over the years government contributions have amounted to 56% of indemnities paid. The programme is classified under C.1 even though many different commodities are covered by the programme because the programme is administered on a commodity-specific basis, each eligible commodity having a particular reference yield and payment is based on the actual yields of specific commodities. In this sense, it is like a single-commodity policy repeated for many different commodities. A “variable” rate is attributed to the payment because it is a function of current yield as compared with a reference yield and not simply area. This programme is labelled as a payment based on “area” because payments are made on a per-hectare basis. Had it been a subsidy to purchase crop insurance from a private insurance company, it would be classified under B.1 as a subsidy to a variable cost: insurance.

### C.2. Payments based on current A/An/R/I of a group of commodities, production required

**Payments to organic crop farming (EU)**

Provides payments per hectare for a subset of commodities. As organic producers have to use specific production methods in order to receive the payment, it is labelled as “with” input constraints. Transfers are allocated to commodity group “All crops”.

**Agri-environmental grass premium (France)**

Provides a payment per hectare of grassland farmed extensively. Farmers have to fulfill specific obligations for five years. They are defined at the local level and include a maximum stocking density, a minimum share of grass land in total agricultural area, the maintenance of permanent and temporary pastures, the requirement to cut the grass (if not used as pasture), limits on fertiliser application, the preservation of fixed landscape features, strong restrictions on pesticide use and registration of practices. There are input constraints to satisfy but the level of payment is not affected by the level of input use (as in the Grassland Reserve Program classified in B.2). There is no limit on how much grass can be produced and thus no production limits.
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<th>Categories</th>
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<tbody>
<tr>
<td>With or without current commodity production limits</td>
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<td>With or without commodity production exceptions</td>
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<th>with/without L</th>
<th>with V/F rates</th>
<th>with/without C</th>
<th>A/An/R/I</th>
<th>SC/GC/AC</th>
<th>with/without E</th>
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<td>without L</td>
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<tr>
<th>Income tax concessions (US)</th>
<th>na</th>
<th>without L</th>
<th>V</th>
<th>with C</th>
<th>A</th>
<th>na</th>
<th>with E</th>
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<tbody>
<tr>
<td>Income tax concessions to agriculture relative to the standard income tax provisions. It includes deductions from taxable incomes from farming; farmers' marketing and purchasing co-operatives; and export transactions of agricultural commodities. The implicit transfer to producers is based on farming income, and so is labelled as based on &quot;income&quot;. Since it is available to all producers, it is labelled as supporting all commodities.</td>
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<thead>
<tr>
<th>Structural payment to milk producers (Norway)</th>
<th>na</th>
<th>with L</th>
<th>F</th>
<th>without C</th>
<th>An</th>
<th>SC</th>
<th>without E</th>
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<tr>
<td>Provides a lump sum payment to all farms with five or more cows. Since 99.85% of farms exceed the cap in terms of animal units, this policy is classified as a transfer not dependent on current commodity parameters but requiring production. As this payment is made for milk within a production quota, it is labelled with current production limits. The payment does not vary with prices, income or cost and so is labelled as having fixed payment rate.</td>
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<tr>
<th>Counter cyclical payments (US)</th>
<th>na</th>
<th>V</th>
<th>with C</th>
<th>A</th>
<th>na</th>
<th>with E</th>
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<tr>
<td>Payment for wheat, feed grains, upland cotton, rice, oilseeds and peanuts defined as the national payment rate per tonne for each specific crop times the producer's payment base yield and multiplied by 85% of the producer's payment eligible base area. Base area and yields may be those from the 1996 Farm Act or the 1998-2001 averages. For each commodity, the national payment rate per tonne is the difference between the target price and the trigger level, which is the return per tonne (i.e. the higher the market price or loan rate) plus the Direct Payment per tonne, and so is labelled as having a variable payment rate. The payment is labelled &quot;with&quot; input constraints because eligible producers are required to comply with certain conservation and wetland provisions. The land must be kept in agricultural uses (which includes fallow) and producers are permitted to plant all cropland acreage on the farm to any crop, except for limitations on planting fruits and vegetables, and so is labelled &quot;with&quot; exceptions.</td>
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<td>With or without current commodity production limits</td>
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<td>With or without input constraints</td>
<td>Based on area, animal numbers, receipts or income</td>
<td>Based on a single commodity, a group of commodities or all commodities</td>
<td>With or without commodity production exceptions</td>
<td></td>
</tr>
<tr>
<td>with/without L</td>
<td>with V/F rates</td>
<td>with/without C</td>
<td>A/An/R/I</td>
<td>SC/GC/AC</td>
<td>with/without E</td>
<td></td>
</tr>
</tbody>
</table>

**E.2. Payments based on non-current A/An/R/I, production not required, fixed rates**

<table>
<thead>
<tr>
<th>Single payment scheme (historical) (EU)</th>
<th>Payment per hectare based on the farm’s historical reference amounts of premiums for most crop and livestock commodities received during the period 2000-02. The single payment scheme is subject to cross-compliance conditions (the amount of payment is reduced if the farmer does not comply), and so is labelled “with” input constraints. Production is not required and producers are permitted to produce any commodity with the exception of fruits and vegetables. It is therefore labelled as “with” commodity exceptions.</th>
</tr>
</thead>
<tbody>
<tr>
<td>na</td>
<td>F</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Single payment scheme (regional) (EU)</th>
<th>Payment per hectare based on the regional, historical reference amounts of premiums for most crop and livestock commodities received during the period 2000-02. The per hectare rate is the total entitlement of the region divided by the number of arable hectares. Production is not required and, unlike the historical scheme, there are no restrictions on the commodities that can be produced, and so it is labelled “without” commodity exceptions.</th>
</tr>
</thead>
<tbody>
<tr>
<td>na</td>
<td>F</td>
</tr>
</tbody>
</table>

**F.1. Payments based on non-commodity criteria: long-term resource retirement**

<table>
<thead>
<tr>
<th>Afforestation (EU)</th>
<th>Payments per hectare to encourage the alternative use of agricultural land for forestry or activities related to forestry in farm holdings. Land is retired from agricultural production, therefore, following a negative response to question 1 (sub-section 3.3.1), the classification leads directly to question 11 and then 12. Policies in category F.1 are automatically labelled as being “with” input constraints.</th>
</tr>
</thead>
<tbody>
<tr>
<td>na</td>
<td>na</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Conservation Reserve Program (US)</th>
<th>Provides annual rental payments and cost-sharing assistance to establish long-term, resource conserving cover on eligible farmland. It is classified in F.1 because of the long-term nature of the Programme involving 10-15 year agreements. The payment is classified as “with” input constraints because the land is taken out of production.</th>
</tr>
</thead>
<tbody>
<tr>
<td>na</td>
<td>na</td>
</tr>
</tbody>
</table>
## Payments based on non-commodity criteria: a specific non-commodity output

<table>
<thead>
<tr>
<th>Categories</th>
<th>Labels</th>
</tr>
</thead>
<tbody>
<tr>
<td>With or without current commodity</td>
<td></td>
</tr>
<tr>
<td>production limits</td>
<td></td>
</tr>
<tr>
<td>With variable or fixed payment</td>
<td></td>
</tr>
<tr>
<td>rates</td>
<td></td>
</tr>
<tr>
<td>With or without input constraints</td>
<td></td>
</tr>
<tr>
<td>Based on area, animal numbers,</td>
<td></td>
</tr>
<tr>
<td>receipts or income</td>
<td></td>
</tr>
<tr>
<td>Based on a single commodity, a</td>
<td></td>
</tr>
<tr>
<td>group of commodities or all</td>
<td></td>
</tr>
<tr>
<td>commodities</td>
<td></td>
</tr>
<tr>
<td>With or without commodity</td>
<td></td>
</tr>
<tr>
<td>production exceptions</td>
<td></td>
</tr>
<tr>
<td>with/without L</td>
<td></td>
</tr>
<tr>
<td>with V/F rates</td>
<td></td>
</tr>
<tr>
<td>with/without C</td>
<td></td>
</tr>
<tr>
<td>A/An/R/I</td>
<td></td>
</tr>
<tr>
<td>SC/GC/AC</td>
<td></td>
</tr>
<tr>
<td>with/without E</td>
<td></td>
</tr>
</tbody>
</table>

### Payments for Hedges and Rustic Groves (Switzerland)

Payment per hectare of hedge and rustic grove (including 3-metre wide compulsory grass strips along them), cultivated without fertilisers and plant protection products. Payment is limited to 50% of the cultivated area on farms of more than 3 hectares and the rate of payment decreases with the altitude of the farming location. The payment is classified as "with" input constraints because the land is taken out of production and the grass strips are cultivated without fertilisers and chemicals.

### Payments for Floral Fallow (Switzerland)

Payment per hectare of floral fallow cultivated with wild indigenous species without fertilisers and plant protection products and for which harvest is authorised once every two years and which cannot be used for fodder (to protect nesting birds). Payment is limited to 50% of the cultivated area on farms of more than 3 hectares and the rate of payment is fixed. Harvest cannot be used for fodder, so the answer to the question 1 of the classification criteria is negative and a negative response in given to question 12 and positive to question 13. The payment is classified as "with" input constraints because it implies a constraint on the production method.

1. The abbreviation "na" indicates that the particular label is not applicable to that PSE category.
2.  *Supplément de prix pour le lait transformé en fromage.*
3. Countries providing fuel tax rebates include Australia, Canada, Japan, Mexico, Norway, Switzerland, the US, and the majority of EU countries.
5. *Prime herbagère agro-environnementale.*
3.4. Classifying policies that support producers collectively (GSSE)

- Policy measures included in the GSSE are classified into one of seven categories according to the nature of the services provided.

3.4.1. Definition of categories and classification criteria

60. The transfers in the GSSE are payments to eligible private or public services provided to agriculture generally. Unlike the PSE and CSE, the GSSE transfers are not destined to individual producers or consumers, and do not directly affect farm receipts (revenue) or consumption expenditure, although they may affect production and consumption of agricultural commodities in the longer term.

61. While implementation criteria are used to distinguish whether the transfer is allocated to PSE or GSSE (sections 3.1 and 3.2), the definition of the categories in the GSSE and the allocation of policy measures to these categories is according to the nature of the service. These categories are named and defined in Box 3.3.

Box 3.3. Names and definitions of the GSSE categories

<table>
<thead>
<tr>
<th>Category</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Research and development</td>
<td>budgetary payments financing research and development activities improving agricultural production.</td>
</tr>
<tr>
<td>Agricultural schools</td>
<td>budgetary payments financing agricultural training and education.</td>
</tr>
<tr>
<td>Inspection services</td>
<td>budgetary payments financing control of quality and safety of food, agricultural inputs and the environment.</td>
</tr>
<tr>
<td>Infrastructure</td>
<td>budgetary payments financing improvement of off-farm collective infrastructure.</td>
</tr>
<tr>
<td>Marketing and promotion</td>
<td>budgetary payments financing assistance to marketing and promotion of agro-food products.</td>
</tr>
<tr>
<td>Public stockholding</td>
<td>budgetary payments meeting the costs of depreciation and disposal of public storage of agricultural products.</td>
</tr>
<tr>
<td>Miscellaneous</td>
<td>budgetary payments financing other general services that cannot be disaggregated and allocated to the above categories due, for example, to a lack of information.</td>
</tr>
</tbody>
</table>

3.4.2. Discussion

62. Research and development category includes payments to institutions for research related to agricultural technologies and production methods. In most cases, these payments include the financing of public research institutions (mostly through the budget of the ministry of agriculture), as well as grants financed by public funding provided to private research institutions and agricultural universities.

63. Agricultural schools category includes the public funding of education and training targeted specifically on the agricultural sector. These payments do not include public expenditure financing basic school education. They cover public expenditure on agricultural vocational schools and training for farmers. Where educational establishments provide training beyond primary agriculture, a suitable estimation method should be sought in order to only include services provided to farming.

64. Inspection services category includes payments to finance institutions of quality control of food, animal health, and agricultural inputs. In most cases, these services are financed by public (governmental organisations) and hence the budgets of these organisations are included in the GSSE. Should these services be provided by private institutions, the GSSE should account only for the amount of public finance granted to these institutions. If the unpaid services is provided on farms (e.g. animal vaccinations),
the corresponding costs should be allocated to the PSE (Category B.3, Payments based on on-farm services). However, expenditures with respect to quarantine systems, even if applied at the farm level, are included in the GSSE.

65. **Infrastructure** category includes public expenditure financing the development of production-related infrastructure in rural areas. Special care should be given to distinguish support to on- and off-farm infrastructure. For example, structural improvement measures, such as farm consolidation, construction of irrigation and drainage installations on farms, are included in the PSE as is direct investment assistance. The physical on-farm (PSE) and off-farm (GSSE) principle for classification of infrastructural expenditures in the PSE or GSSE is a matter of convention, required for consistent treatment of various infrastructural programmes across countries.

66. **Marketing and promotion** covers publicly (co)financed investments in development of agricultural marketing and processing, typically carried out under projects related to structural adjustment and competitiveness of the agricultural sector. This category also includes such forms of government assistance to increase sales of primary agricultural commodities, such as agricultural exhibitions, fairs, promotional campaigns, advertising, and publications.

3.5. Classifying policies that support consumers (CSE)

- The CSE includes price transfers from consumers, which is the inverse value of Market Price Support adjusted to apply to quantities consumed.
- Other policies classified in the CSE are budgetary transfers to consumers to compensate their contribution to market price support, as well as consumption subsidies based on the disposal of intervention stocks.

67. As described in Section 3.2 (Question 3), a component of the CSE is transfers associated with market price support for the production of commodities that are consumed domestically; these are called **price transfers from (to) consumers**. These transfers are the same as those included in the PSE under category A.1 Market Price Support, but they are attributed an opposite sign in the CSE and adjusted to apply to quantities consumed (as opposed to quantities produced in the PSE). The concept is explained in detail in Chapter 4.

68. Another type of payment classified under the CSE is **budgetary transfers to first consumers** of agricultural commodities, e.g. flour mills, meat processing plants, or fruit packing plants, where these are provided specifically to offset the higher prices resulting from market price support. An example is payments made to processors who pay the minimum price to producers of potato starch and cotton in the European Union.

69. Finally, **consumption subsidies** in cash or in kind (their monetary equivalent) associated with programmes of market price support for domestic producers are also included in the CSE. This component includes, for example, domestic food aid programmes which are based on the distribution of government stocks acquired in the context of market interventions.
PART II

CALCULATING SUPPORT INDICATORS
CHAPTER 4.

ESTIMATING POLICY TRANSFERS: PRICe TRANSFERS

70. Once policies have been identified for inclusion in the measurement of support and appropriately classified and labelled, the next step is to estimate the value of transfers created by these policies. Policy transfers are divided into the following broad groups: price transfers, and other transfers (i.e. budgetary transfers and revenue foregone). This chapter shows how to estimate price transfers, while Chapter 5 discusses the estimation of other transfers.

71. The chapter begins with a theoretical discussion regarding price transfers that arise from policies that affect domestic market prices. Policies that increase and decrease domestic market prices are differentiated for both importing and exporting situations. The following two sections explain how price transfers to producers and consumers are estimated. The fourth section discusses the estimation of the Market Price Differential, an integral component of price transfers.

4.1. Price transfers arising from policy measures: a graphical analysis

- Policies which increase domestic market prices create transfers to producers from consumers. Producers also receive transfers from taxpayers when the commodity is exported. When the commodity is imported, additional transfers go from consumers to others, including central government, in the form of tariff revenue.
- Policies which decrease domestic market prices create transfers from producers to consumers. Consumers also receive transfers from taxpayers when the commodity is imported. When the commodity is exported, additional transfers go from producers to others, including central government.

72. The key theoretical assumption underlying the estimation of support is that agricultural markets are competitive. The characteristics of competitive markets, such as perfect information, homogeneity of products traded and free entry and exit, imply price arbitrage. Market agents exploit and gain from price differences across markets. Theoretically, price arbitrage works to dissipate price wedges between domestic and world market, so that there is a stable tendency of domestic prices to align with external prices when expressed in a common currency unit. In this context, a persistent price differential between the domestic and external markets is the result of government interventions. As such, this price differential becomes a key parameter for estimating transfers arising from government’s price policies.

73. A variety of government policy measures affect the domestic market price of a commodity, including measures imposed at the border, such as tariffs, export subsidisation, 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.

8. This impact of arbitrage on prices of identical commodities exchanged in two or more markets is often referred to as the “law of one price”. This law states that in an efficient market there must be, in effect, only one price for identical commodities regardless of where they are traded (although in nominal terms prices in different locations and along the value chain differ according to transaction costs).
74. This policy-induced price difference is denoted as the Market Price Differential (MPD):

\[ MPD = DP - BP \]  

where: \( MPD \) – Market Price Differential  
\( DP \) – Domestic market price  
\( BP \) – Border price

75. MPD is positive when the policy induces a higher domestic market price, thereby supporting commodity production; it is negative when the policy induces a lower domestic market price, thereby discouraging commodity production.\(^9\) Policies which alter the domestic market price affect both producers and consumers of a commodity; but they can also involve transfers to or from the government budget and therefore have implications for taxpayers.

76. Using a partial equilibrium framework, Figures 4.1 and 4.2 illustrate the price transfers associated with policies that increase or decrease the domestic market price of a commodity respectively. In both cases a distinction is made according to whether the commodity is imported or exported. Domestic supply and demand curves are denoted by SS and DD respectively. The various price transfers are distinguished according to three economic groups – producers, consumers and others (including taxpayers) – receiving and financing these transfers.\(^10\)

77. Panel A of Figure 4.1 presents the case where policies that increase the domestic market price are introduced on an imported commodity. In the absence of these policies, equilibrium will be reached in the domestic market when the domestic price is equal to the import price (MP); with domestic production equal to \( QP_1 \) and domestic consumption equal to \( QC_1 \). The difference between demand and supply, \( QC_1 - QP_1 \), is met by imports.

---

9. In this discussion, and in the calculation of the indicators in general, positive and negative price gaps and the concept of support, are described from the perspective of the producer. The perspective of the consumer is the reverse. Policies which raise market prices discourage consumption: policies which lower market prices support consumption.

10. These transfers are not welfare effects of support policies.
78. Policies that increase the domestic market price are now introduced, e.g. a tariff. Producers benefit from a higher price, encouraging them to produce more; consumers on the other hand reduce consumption. A new domestic market equilibrium is reached at price DP, resulting in a positive MPD; with production rising to QP₂, consumption falling to QC₂, and the volume of imports falling to QC₂ – QP₂.

79. In the import situation, policies which increase domestic market prices create the following price transfers:

- **Transfers to Producers from Consumers (TPC),** with the value corresponding to rectangle abcd:
  \[
  TPC_i = MPD_i \times QP_i
  \]  
  \[4.2\]

- **Other Transfers from Consumers (OTC),** with the value corresponding to rectangle dcef. These transfers are due to the fact that consumers pay the higher price Pd for all consumption, whether the commodity is produced domestically or imported:
  \[
  OTC_i = MPD_i \times (QC_i - QP_i)
  \]  
  \[4.3\]

80. When there is only a tariff in place, the area dcef measures transfers from consumers to the budget in the form of tariff receipts. However, when other policy measures are used, e.g. tariff quotas, who receives this transfer from consumers depends on what measures are in place and how they are implemented. For example, if tariff quota imports are controlled by a state trading enterprise, the enterprise may be in a position to determine how much it retains and how much goes to the state. Alternatively, if tariff quota imports are controlled through licences and distributed on a first-come-first-served basis, part or all of the transfer (termed “quota rents”) may be obtained by those who receive the licenses, whether domestic importers or foreign exporters. But no matter who receives the transfers (in the form of tariff revenue or quota rents), they have been paid by consumers.

81. Panel B presents the case where policies that increase the domestic market price are introduced on an exported commodity. In the absence of policies, equilibrium will be reached in the domestic market when the domestic price is equal to the export price (XP). At this price, production is equal to QP₁ and consumption equal to QC₁. In this case, the difference between supply and demand, QP₁ – QC₁, is exported.

82. Policies that increase domestic market prices are now introduced. Consequently, the domestic price (DP) increases above the export price, creating a positive MPD. Producers benefit from a higher price, which encourages them to increase production to QP₂; consumers now pay a higher price, which results in a reduction in consumption to QC₂; and the quantity exported increases to QP₂ – QC₂.

83. In the export situation, policies which raise domestic market prices create the following price transfers:

- **Transfers to Producers from Consumers (TPC),** with the value corresponding to rectangle ghij:
  \[
  TPC_i = MPD_i \times QC_i
  \]  
  \[4.4\]

- **Transfers to Producers from Taxpayers (TPT),** with the value corresponding to rectangle jikl. These transfers represent the part of producer price support borne by taxpayers in the form of budgetary outlays on export subsidisation, food aid or public stockholding:
  \[
  TPT_i = MPD_i \times (QP_i - QC_i)
  \]  
  \[4.5\]
84. An important distinction between the import and export situations is that in the former only part of total price transfers created (abef) is received by producers (TPC) and this part is entirely financed by consumers. In the export case, all transfers (ghkl) are received by producers and their cost is shared between consumers and taxpayers.

85. A similar analysis can be done for the situation where policies that induce a lower domestic market price are introduced, i.e. when a negative MPD is observed (Figure 4.2). Panel A shows the outcome when such policies are introduced on an imported commodity. In the absence of policies, equilibrium will be reached in the domestic market when the domestic price is equal to the import price (MP). At this price, production is equal to QP1; consumption equal to QC1; and the difference between demand and supply, QC1 – QP1, is imported.

Figure 4.2. Price transfers associated with policies that decrease the domestic market price

A. Imported commodity

B. Exported commodity

86. Policies that decrease the domestic market price are now introduced. For example, the government wishes to lower food prices by setting administrative limits on domestic prices and subsidising imported product. Consequently, the domestic price (DP) falls below the import price, creating a negative MPD. Production falls to QP2 and consumption rises to QC2. In this case, in contrast to Graph A, Figure 4.1, there is an increase in the volume of imports, QC2 – QP2. In the import situation, policies that decrease domestic prices create price transfers to consumers (abef) from producers (TPC) and taxpayers (OTC).

87. Panel B of Figure 4.2 presents the case for an exported commodity. In the absence of policies, equilibrium will be reached in the domestic market when the domestic price is equal to the export price (XP). At this price, production is equal to QP1 and consumption is equal to QC1. In this case, the difference between supply and demand, QP1 – QC1, is exported.

88. Policies that decrease the domestic market price are now introduced. For example, the government regards agriculture as a source of budgetary revenue and imposes a tax on agricultural exports. In addition, a policy of low food prices is implemented in accordance with the government’s social objectives. Consequently, the domestic price (DP) decreases, creating a negative MPD. Production falls to QP2; consumption rises to QC2; leading to a decrease in the volume of exports, QP2 – QC2. In the export situation, policies that reduce the domestic market price of a commodity create transfers to consumers (TPC) from agricultural producers, who also finance transfers to the budget (TPT) in the form of export taxes, resulting in overall transfers from producers represented by the area ghkl.
4.2. Price transfers to producers

- MPS for a commodity is estimated by adding together transfers to producers from consumers and taxpayers, alternatively found by multiplying the quantity of production by the MPD.
- Adjustments for Price Levies and Excess Feed Cost net out the contribution that producers make to MPS.

89. In calculating the indicators, price transfers to producers are called Market Price Support (MPS) and defined as: the annual monetary value of gross transfers from consumers and taxpayers to agricultural producers, measured at the farm gate level, arising from policy measures that support agriculture by creating a gap between domestic market prices and border prices of specific agricultural commodities.

90. Before presenting a general formula for estimating MPS, two new items need to be explained.

91. One is the Price Levies (LV), sometimes termed production taxes, which can be imposed on producers as part of market price support policy. An example of such a tax is the levy imposed on EU milk producers when they exceed their production quotas. Another example would be levies charged on producers to finance some of the cost of export subsidisation. LV is an observed value, which is obtained from the information on budgetary expenditures.

92. The second item is the Excess Feed Cost (EFC), a component accounting for the price transfers that go from livestock producers to feed producers as a result of policies which alter the domestic market price for feed crops.

93. The Price Levies and Excess Feed Cost are accounted for in the MPS in order to net the value of price transfers to producers of contributions that producers make to the transfers. At the same time, the EFC adjustment also eliminates double counting of price transfers in the aggregation of MPS across commodities when deriving a national (aggregate) level MPS.

94. Based on the analysis in the previous section, a general formula for the calculation of MPS for commodity \(i\) is expressed as:

\[
MPS_i = TPC_i + TPT_i - LV_i - EFC_i
\]  

[4.6]

where:
- \(TPC_i\) – Transfers to Producers from Consumers of commodity \(i\)
- \(TPT_i\) – Transfers to Producers from Taxpayers of commodity \(i\)
- \(LV_i\) – Price Levies for commodity \(i\)
- \(EFC_i\) – Excess Feed Cost for commodity \(i\) (livestock commodities only)

95. EFC is included in the estimation of MPS for livestock commodities only and calculated as:

\[
EFC_i = \sum_j (MPD_j \times QC_j^i)
\]  

[4.7]

where:
- \(EFC_i\) – Excess Feed Cost for livestock commodity \(i\)
- \(MPD_j\) – Market Price Differential for feed crop \(j\)
- \(QC_j^i\) – Quantity of crop \(j\) used as an input into the production of livestock commodity \(i\)
96. The EFC adjustment may increase or reduce the value of MPS for livestock depending on particular mix of price affecting policies in place. For example, in a situation where both livestock and feed crop production are supported by policies which increase domestic market prices, resulting in positive MPDs, the EFC adjustment would reduce the MPS value for livestock. This occurs because livestock producers pay higher prices for feed crops as a result of price support for these commodities. The opposite would be true if policies are in place to decrease the price of feed, resulting in a negative MPS for feed crops. In this case livestock producers receive additional price support because they can purchase feed at lower prices.

97. Substituting in prices and quantities from equations 4.2 and 4.5 into 4.6 yields equations 4.8a and 4.8b which distinguish the import and export situation. Both equations reduce to the same expression of transfers to producers. However, the transfers to producers from consumers (TPC) and from taxpayers (TPT) are identified separately and may then be used to calculate other indicators and to analyse the composition of support.

\[ MPS_i = (MPD_i \times QP_i) - LV_i - EFC_i \]  

[4.8a]

In the import situation, TPT is zero.

\[ MPS_i = (MPD_i \times QC_i) + (MPD_i \times (QP_i - QC_i)) - LV_i - EFC_i \]  

\[ = (MPD_i \times QP_i) - LV_i - EFC_i \]  

[4.8b]

98. In calculating the indicators, MPS is first estimated for individual commodities. These estimates are used to calculate a national (aggregate) MPS, which is a major building block for the calculation of the PSE. The procedure for selecting individual commodities for which to calculate MPS and the method for estimating the national MPS are provided in section 6.1, along with empirical examples.

4.3. Price transfers from consumers

- Price Transfers from Consumers of a commodity are estimated by adding together transfers from consumers to producers and transfers from consumers to other recipients. Alternatively, this can be found by multiplying the quantity of consumption by the MPD.
- An Excess Feed Cost adjustment nets out the contribution that comes from other agricultural producers.

99. Price Transfers from Consumers (PTC) are defined as: the annual monetary value of gross transfers from (to) consumers of agricultural products, measured at the farm gate level, arising from policy measures that support agriculture by creating a gap between domestic market prices and border prices of specific agricultural commodities.

100. Again, based on the analysis in section 4.1, a general formula for the calculation of transfers from consumers resulting from policies which affect market price for commodity \( i \) can be expressed as:

\[ PTC_i = -(TPC_i + OTC_i) + EFC_i \]  

[4.9]

where: \( TPC_i \) – Transfers to Producers from Consumers of commodity \( i \)
101. In this case, TPC and OTC are given a negative sign because these transfers represent an implicit tax on consumers. Excess Feed Cost (EFC) is a component introduced to remove from the estimation of PTC the value of transfers that come from agricultural producers rather than consumers. This contribution is due to the fact that part of the agricultural output – the crops used in animal feed – is purchased by livestock producers. The EFC adjustment is only included in the calculation of PTC for crop commodities. This eliminates double counting of price transfers when aggregating the PTC across commodities. EFC is calculated as follows.

\[ EFC_j = \sum_i (MPD_j \times QC_i') \]  

where:  
\( EFC_j \) – Excess Feed Cost in PTC for crop \( j \)  
\( MPD_j \) – Market Price Differential for feed crop \( j \)  
\( QC_i' \) – Quantity of crop \( j \) that is consumed in production of livestock commodity \( i \)

102. In the consumption case, the EFC adjustment reduces the absolute value of the PTC for crop commodities because it excludes the transfers that come from livestock producers who use crops as feed input. For example, when feed crop production is supported by policies, resulting in a positive MPD, the EFC adjustment would reduce the negative PTC, i.e. it will become less negative. Alternatively, if feed crop consumption is supported through policies which decrease domestic market prices, resulting in a negative MPD, then the EFC adjustment reduces the positive PTC, i.e. it becomes less positive.

103. Substituting in prices and quantities from equations 4.2 to 4.5 yield separate calculations for both the import and export situation (4.11a and 4.11b). Both equations reduce to the same expression for calculating transfers from consumers. Again, the practice is to estimate separate values for the recipient of the transfers from consumers to producers and others, which are then used for calculating other indicators and for analysing the composition of support.

**Import Situation**

\[ PTC_i = -(MPD_i \times QP_i) + (MPD_i \times (QC_i - QP_i)) + EFC_i \]

\[ = -(MPD_i \times QC_i) + EFC_i \]  

**Export Situation**

\[ PTC_i = -(MPD_i \times QC_i) + EFC_i \]  

In the export situation, OTC is zero

104. As in the case of MPS, PTC is estimated for a number of individual commodities. These estimates are then used to calculate various commodity-specific indicators of support to consumers, as well as to obtain the aggregate consumer Single Commodity Transfers for a country, which is also the major building block for calculation of the Consumer Support Estimate. These topics are covered extensively in Chapter 7, including numerical examples.
4.4. Market Price Differential (MPD)

- The MPD measures the extent to which policies affect the market price of a commodity.
- Normal practice is to calculate the MPD using a price gap, which measures the difference between domestic and border price of a commodity.
- As an alternative to the price gap method, MPD can be derived from the value of export subsidies or based on applied MFN tariff rate.

105. As demonstrated in the preceding sections, a key component in estimating the value of price transfers is the MPD which measures the extent to which policies affect the market price of a commodity. An MPD is calculated for a commodity when one or more policies are applied that change the market price received by producers of that commodity. When there are no such policies in place, an MPD is not calculated and is assumed to be zero.

106. Policies that change the market price for a commodity include, but are not limited, to the following list:

- Import measures – e.g. tariffs, levies, import quotas, tariff quotas and licensing requirements.
- Export measures – (a) enhancing exports, e.g. export subsidies, export credits and foreign food aid; (b) limiting exports, e.g. quantitative restrictions, licensing, export bans and export taxes.
- Domestic price support measures – e.g. production quotas, administered prices and intervention purchases, including for domestic food aid, public stockholding and market withdrawals.

107. The benefit of calculating the value of price support transfers through an MPD is that it captures in a single measure the combined impact on market prices of a potentially complete set of price policies. Policies which raise the price received by producers for a commodity without changing the market price (i.e. without raising consumer prices) are included elsewhere within the PSE under Category A.2 (Payments based on output).

108. Most commonly, policies affecting market prices are implemented by governments in order to increase the price received by producers of a commodity. Ceteris paribus, such policies will lead to a positive MPD. The MPD is interpreted as a static measure of the additional price received by producers resulting from agricultural policies in a given year. It is the extra cost paid by consumers and in some cases also by taxpayers, resulting from policies that provide market price support to agricultural production. Alternatively, as analysed in section 4.1, some countries may implement policies that lower market price for a commodity. Ceteris paribus, such policies will lead to a negative MPD.

109. The common approach to calculate the MPD for a commodity is to measure the difference between two prices, i.e. a domestic market price in the presence of the policies and a border price, whether an import or export price, representing the opportunity price (cost) for domestic market participants.

110. The graphical analysis presented in section 4.1 simplified the domestic market down to just one level at which transactions takes place. In reality there are a number of different levels at which prices can be measured within a domestic market: farm gate prices (i.e. prices received by producers), wholesale prices, retail prices, prices at the border, etc., that reflect, among other things, various stages of processing. Section 4.5 discusses how to select and adjust domestic market prices and border prices to calculate the MPD at the farm gate level. Section 4.6 details two alternative procedures, sometimes used to derive an MPD, which do not rely on the price gap method.
4.5. Calculating an MPD based on the price gap method

4.5.1 General approach

111. An underlying principle is that support is measured at the farm gate level. Consequently, the task is to obtain an estimate of the price gap at the farm gate level. The challenge in doing this is that an agricultural commodity that is sold by a producer at the farm gate may be very different from the products derived from that commodity which pass through the border. This is particularly so for livestock commodities and commodities such as sugar, wine grapes and oranges (juice), for example, which may have a significant degree of processing involved before being traded at the border. In addition, border prices include transportation, handling and other costs incurred in bringing the product to the point of trade (Diagram 4.1).

![Diagram 4.1. Schematic presentation of value added chain](image)

Price gap calculation using farm gate prices

112. One method to deal with this challenge of comparing “like with like” is to compare a producer price, *i.e.* a price which is received at the farm gate level, with a border price that has been adjusted to make it comparable with the farm gate producer price. This involves netting the border price of marketing margins that may be applicable. It also involves weight adjustment, so that prices are comparable on a quantity basis, and adjustments for quality differences if relevant. As a result of these adjustments a border price measured at the farm gate is obtained, further referred to as the reference price. The MPD for a commodity estimated through this method is expressed as:

\[
MPD_i = DP_i - BP_i
\]

11. Note that the MPD expression in equation 4.12 differs from that in equation 4.1, where adjustments of border price to the farm gate were omitted for simplification.
and:

$$R_P = (BP \times QA_i - MM_i) \times WA_i$$

where:

- $PP_i$ – producer price for commodity $i$
- $RP_i$ – reference price of commodity $i$ (border price at farm gate)
- $BP_i$ – border price of commodity $i$ or products derived from commodity $i$
- $QA_i$ – quality adjustment co-efficient for commodity $i$
- $MM_i$ – marketing margin adjustment for commodity $i$
- $WA_i$ – weight adjustment co-efficient for commodity $i$

The producer price can be the annual average price received by all producers of a given commodity, or a representative producer price, perhaps of an average product quality grade. The choice relates to what suits the best for observing the “like with like” principle in comparing with the border price chosen. It is not necessarily appropriate to compare an average producer price for a commodity with a border price for one specific product derived from that commodity.

It should be noted that depending on the character of the price data used: (a) border price adjustments in formula 4.13 may not necessarily be expressed in such particular algebraic form; (b) neither adjustment may be necessary; and that (c) making one adjustment does not necessarily require the other.

**Price gap calculation using wholesale prices**

In some cases, an approach is adopted to estimate the price gap at higher level of the value added chain, e.g. at the wholesale level, by using wholesale prices instead of farm gate prices for comparison with border prices. Hence, the MPD can be expressed as:

$$MPD_i = PP_i - RP_i = WP_i - BP_i$$

where: $WP_i$ – wholesale price of commodity $i$

A principal feature of this approach is that it assumes that the absolute price gap measured at a higher level of the processing chain ($WP_i - BP_i$) is the same as occurs at the farm gate level ($PP_i - RP_i$). In some cases, it may be also reasonable to assume the equality of the price gap in relative terms ($\frac{WP_i - BP_i}{BP_i}$), i.e. that it is the rate of protection that is the same at the wholesale and farm gate levels. The latter implies that a proportion of the absolute price gap measured at the wholesale level is captured at that level and only a part of the measured price gap is passed back to the farm gate. In this case the MPD is expressed as:

$$MPD_i = PP_i \times \left(\frac{WP_i - BP_i}{BP_i}\right)$$
117. It is a matter of judgment as to which of the two “equality assumptions” should be used. In principle, the more competitive the food chain, the more reason there is to assume the equality of absolute price gaps. However, if the structural characteristics of the food chain are such that it is more appropriate to assume that part of the protection is captured at higher levels of the food chain, it would be preferable to use the assumption of the equality of relative price gaps.

118. Theoretically, the method to calculate the MPD using the farm gate prices is superior to the one based on wholesale prices because the latter employs simplified assumptions on the transmission of protection across the food chain. However, in practical terms the choice is usually determined by the nature and availability of the price and marketing margin data. In some cases, it may be more appropriate to measure the price gap at a higher level of the value chain. First, this will avoid most (or all) of the adjustments of border price to the farm gate. Both wholesale and border prices, properly selected, represent products at the same value added level. Wholesale markets may be located near the border, hence the transportation differential between the two markets can be ignored. This is a considerable advantage when information on marketing margins is scattered and difficult to obtain. Therefore, it may be more accurate in some cases to use wholesale prices to estimate the MPD than to adjust the border price to the farm gate when there is imperfect marketing margin data. Second, the data on farm gate prices is not always available or representative. This is the case, for example, of highly integrated industries, such as the poultry or sugar industries, where considerable quantities of primary production are directed down the food chain within one firm and without passing through the market.

Box 4.1. Setting a negative price gap to zero

In some cases, an MPD with the sign opposite to what would be expected based on the policies in place may be calculated. This is the case, for example, when an exported commodity the domestic price is below the border price but no policies – export duties, export restrictions, or administrative barriers to inter-regional movement of goods – are applied that would explain the negative price gap. Similarly, when for an imported commodity it may be found that the domestic price is less than the border price, but policies which should increase the domestic price are in place, such as a tariff. In such cases, the MPD is set to zero, i.e. \( PP = RP \). An assumption is made in both cases that the observed price gap is due to factors not related to agricultural policies. While setting the negative MPDs to zero improves the accuracy of the annual estimation, it may reduce consistency over time and between countries, as positive MPDs may also capture the impact of non-policy factors, while negative MPDs, when set to zero, do not.

119. The following sub-sections develop the calculation of price gap further. Sub-section 4.5.2 discusses the selection of a border price, while the last three sub-sections focus on the key elements of adjusting the border price to the farm gate: sub-sections 4.5.3 and 4.5.4 discuss, respectively, the marketing margin and weight adjustments, while sub-section 4.5.5 addresses the need for quality adjustments.
4.5.2 Selecting a border price

120. A variety of border prices and alternative methods are used to calculate MPDs for OECD and selected non-OECD countries (Table 4.1). The choice of a border price for a given commodity in any country is determined by factors such as market structures, specifically the net trade position of the commodity concerned, and data availability. The net trade situation is defined by comparing total domestic consumption and production of the commodity. When there is no trade because the commodity, tradable in principle, is highly protected, the country is treated as a net import.

Border price for an exported commodity

121. If the country is a net exporter of the commodity, the most appropriate border price is an FOB value.12 Very simply:

\[ BP_i = FOB_i \]  

[4.16]

122. The FOB value may be either an annual average of a specific FOB quotation price or the annual average unit value of exports of the commodity (i.e. total value of exports divided by total quantity). An FOB unit value may correspond to different levels of tariff aggregations. If so, care needs to be taken to ensure that prices and quantities relate to a common unit for calculating an average unit value. It is preferable to choose the tariff lines for the least transformed products. If trade in these products is small then more traded tariff lines may be used.

123. As shown in Table 4.1, FOB prices are the main source from which reference prices are derived for the European Union and Turkey, and Brazil, China and Ukraine. For the EU both export unit values (e.g. for pigmeat and poultry) and specific FOB quotation prices (e.g. the London daily price for white sugar from EU ports) are used.

124. In the case of a large exporter of a commodity, if exports account for a significant share of domestic production and no export subsidy or other export enhancing measures are applied, the MPD is assumed to be zero. This assumption is made for the majority of commodities produced in Australia and New Zealand, and for apples, grapes (table) and oranges in South Africa.

---

12. FOB stands for Free on Board. It is the cost of an export good at the exit point in the exporting country loaded in the ship or other means of transport in which it will be carried to the importing country.
Table 4.1. Border prices and alternative methods used to derive the MPD by country

<table>
<thead>
<tr>
<th>Country</th>
<th>Border Prices</th>
<th>Alternative Methods</th>
<th>Set equal to PP (MPD is zero)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Net Exporter</td>
<td>Net Importer</td>
<td>Net Exporter</td>
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<tr>
<td></td>
<td>Country's own</td>
<td>Other country</td>
<td>Export</td>
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<tr>
<td></td>
<td>Traded price</td>
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<tr>
<td></td>
<td>Export price</td>
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<td></td>
<td>(FOB)</td>
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<tr>
<td></td>
<td>Import price</td>
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<td></td>
<td>(CIF)</td>
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<td>Wholesale</td>
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<td>Producer price</td>
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</table>

**Australia**<br>MK<br>MA<br>RI<br>BA, BF, CT, EG, OT, PK, PT, RP, RS, SB<br>Sh, SF, SH, SO, WL, WT<br>Net Exporter<br>Net Importer<br>Border Price<br>Alternative Methods<br>Set equal to PP (MPD is zero)<br><br>**Canada**<br>BA, BF, EG, MK, OT, PK, PT, RS<br>MA, RI, SH, TO<br>BF, EG, PT<br>MA<br>BA, PK, RS, SB, WT<br>**EU-25**<br>MA, RI, SH, TO<br>BF, EG, MK, PT<br>WL<br>**Iceland**<br>SH<br>BF, EG, MK, PK, PT<br>WL<br>**Japan**<br>BA, CC, CU, GR, MK, MN, PR, RI, RS, SP, SW, WO<br>PK<br>AP, BF, EG, PT<br>SB<br>**Korea**<br>BA, BF, GA, MK, PP, SB<br>RI<br>PK<br>EG, PT<br>CC<br>**Mexico**<br>TM<br>BA, MA, RI, SB, RS, SO, WT<br>BF, BN, CF<br>EG, PK, PT<br>BA, BF, MA, MK, OT, PK, SH, WL, WT<br>**New Zealand**<br>EG<br>PT<br>**Norway**<br>SH<br>BA, BF, EG, MK, OT, PK, PT, WT<br>WL<br>**Switzerland**<br>BA, MA, MK, OT, RS, WT<br>SH<br>BF, EG, PK, PT<br>RPI<br>**Turkey**<br>AP, CT, GR, PO, SH, TB, TM<br>MK, WT<br>MA, SF<br>BA, BF, EG, PT, RS<br>**United States**<br>MK<br>RS<br>BF<br>BA, EG, PK, PT, RI, WT<br>SH, WL<br>MA, SB, SO<br>**Brazil**<br>BF, CF, MK, PT, RS, SB<br>CT, MK<br>MA, RI, WT<br>**China**<br>AP, BF, EG, MA, PK, PN<br>CT, MK, RP, RS, SB<br>RI, SH<br>**Russia**<br>BA, RS, SF, WT<br>BF, MK, PT<br>MA<br>EG, OT, PK, RY<br>**South Africa**<br>MA, PN, RS<br>MK<br>BF, PK, PT, SF, SH, WT<br>AP, EG, GR, OR<br>**Ukraine**<br>BA, BF, SF, MA, MK, OT, PT, SF, WT<br>EG, PK, RS
Notes to Table 4.1

1. Whether a CIF or FOB price is used to derive a reference price is calculated on a monthly basis depending on the net trade situation.

2. The lower of either the average annual CIF value or the producer price plus tariff.

3. While Swiss import prices are used for butter and SMP, the EU FOB export price is used for cheddar cheese.

4. EEP subsidies were last provided in 1998 for BA, 1996 for EG, 1994 for PK, 2001 for PT, and 1995 for RI and WT.

5. For exported commodities BF, CF, PK, PT, RS and SB, negative price gaps are calculated based on actual prices but MPD is set at zero. For imported commodities MA, RI and WT applied in years for which negative price gaps are calculated MPD is also set at zero (see Box 4.1).

6. Weighted average of Brazilian FOB export prices for Arabica and Robusta coffee.

7. Brazilian import data are officially reported on an FOB basis.

8. For exported commodities AP, BF, EG, PK, PN and PT, negative price gaps are calculated based on actual prices and MPD is set at zero.

9. Weighted average of Thai export price (FOB) for Indica rice and US export prices (FAS – Free Alongside Vessel) for Japonica-type rice.

10. For imported commodity EG, negative price gaps are calculated based on actual prices and MPD is set at zero.

11. For exported commodities MA and PN, negative price gaps are calculated based on actual prices and MPD is set at zero.

\[ BP_i = CIF_i \]  

125. If the country is a net importer of the commodity, and if imports are regular and of a reasonable quantity then the most appropriate border price is a CIF value for imports into that country.\(^\text{13}\)

126. This can be either the annual average CIF unit value for imports of the commodity or products derived from the commodity, or an annual average of a specific CIF quotation price. CIF prices are used for the majority of commodities in Japan and Korea, and for some commodities for the EU and Switzerland.

\(^\text{13}\) CIF stands for Cost, Insurance and Freight. It is the landed cost of an import good on the dock or other entry point in the receiving country. It includes the cost of international freight and insurance and usually also the cost of unloading onto the dock. It excludes any charge after the import touches the dock such as port charges, handling and storage and agents’ fees. It also excludes any domestic tariffs and other taxes or fees, duties or subsidies imposed by a country-importer.
Like in the export case, it is preferable to choose the tariff lines for the least transformed products and if trade in these products is small, more traded tariff lines are be used. However, if imports are irregular and/or insignificant in quantity, other sources for price need to be investigated. Similarly, if imports vary in quality from one year to the other, or are very different from those produced in the country, the unit value of imports should be avoided.

First consider if there are other border prices that might be relevant. It may be appropriate to use a CIF price in another country, particularly if it is located close by and imports significant quantities of the product.

\[ BP_i = CIF_{\text{other}} \]  \hspace{2cm} (4.18)

where: \( CIF_{\text{other}} \) – annual average CIF unit value for imports in another country

As an example of this method, the EU CIF price for sheepmeat is used as a proxy for border price for Iceland, Norway and Switzerland.

Alternatively, if a nearby country is a major exporter of the commodity then an FOB price from that source may provide a satisfactory proxy for border price. In this case, the insurance and freight to the country concerned may be added if considered significant.

\[ BP_i = FOB_{\text{other}} + IF_i \]  \hspace{2cm} (4.19)

where: \( FOB_{\text{other}} \) – an annual average FOB unit value for exports from another country

\( IF_i \) – insurance and freight cost of transporting the product to country concerned

For example, EU FOB prices are used to derive border prices for livestock commodities for Iceland, Norway, Switzerland and Turkey. US FOB export prices are used as the basis for calculating reference prices for a number of commodities for Mexico. Sugar border prices for Mexico and the US are derived from the FOB price of sugar from Barbados.

If actual border prices are not available or relevant, it is also possible to construct a border price based on a wholesale price in another country. For example, border prices for beef in the three North American countries of Canada, Mexico and the US are derived from an Australian wholesale cattle price. A US wholesale price for pigs is used to derive a border price for pigmeat in Japan and Korea. A similar equation to 4.19 is used in this case.

Finally, there are certain situations where it is appropriate to derive a border price for a commodity from a producer price for the same commodity in another country:

\[ BP_i = FG_{\text{other}} + IF_i \]  \hspace{2cm} (4.20)

where: \( FG_{\text{other}} \) – farm gate price from commodity \( i \) in another country

It can be appropriate to use this method when there is significant transformation of the commodity from that produced by the farmer to the product traded internationally. For example, border prices for wool for Norway and Iceland are derived from the New Zealand producer price for wool. This method was also used prior to 2005 to calculate the MPD for milk for all countries monitored. It can also be the appropriate method when the volume of international trade in the product is severely limited by sanitary and phytosanitary requirements, as in the case of poultry meat.
135. The most appropriate border price may also change for a commodity within a country over time. There are primarily three reasons for this: (a) data becomes available (or unavailable), e.g. import flows become regular and significant, resulting perhaps from policy reform lowering border protection; (b) the net trade position of the commodity changes; or (c) there is a significant change in the policy measures affecting the market price of a commodity. The net trade position is reassessed every year: if a country has been a net importer in two of the previous three years, it is considered as a net importer, and vice versa for the net exporting situation.

Box 4.2. Calculating MPD for a commodity with seasonal markets

Some crops (e.g. fruits and vegetables) are highly perishable and seasonal. In principle each month could be considered as a separate market given that supply is specific and cannot be transferred to the following month without bearing high storage costs and deterioration of the goods. Policy interventions, in particular import tariffs, often vary according to the month or season. At harvest time, higher import tariffs are usually applied to protect domestic production, while lower tariffs are applied in off-season periods. These are often referred to as seasonal tariffs. At the same time, market withdrawals may occur during the harvesting period.

In these cases, the annual average MPD is estimated by weighting seasonal MPDs, i.e. the difference between producer and reference prices for each season (or month) within a year, by the seasonal (monthly) quantity of marketed production. When the data are not available the existing pattern of domestic marketed production or consumption may be estimated. Statistics on international trade are currently available on a monthly base. Consequently, if the seasonal pattern of domestic marketed production can be estimated with a sufficient degree of reliability, domestic availability for use can be estimated (or vice-versa if the pattern of domestic consumption is easier to estimate). When no estimation of seasonal production and consumption is possible an annual MPD may be calculated by weighting seasonal MPDs by the number of days each tariff remains in force.

This method is used to calculate the MPD for tomatoes in the EU. A MPD is estimated for each month as the difference between the unit value of intra-EU trade (the domestic price) and the unit value of extra-EU trade (the border price). Monthly MPDs are then averaged using the seasonal pattern of production, i.e. the share of monthly production in total annual production.

4.5.3 Marketing margin adjustment

136. To be correctly compared with the farm gate price, the border price must be made equivalent to the farm gate price, i.e. it must be adjusted for marketing margins, which include costs of processing, transportation and handling of a product incurred between the farm gate and the border.

137. **Processing costs** relate to the physical transformation of primary farm products into marketable ones. Agricultural products often undergo a certain degree of transformation before they are traded: grains are cleaned, dried, or husked; sugar beet is processed into sugar; and animals are slaughtered, cut and packed. The costs of these operations should be netted from the border price.

138. **Transportation costs** relate to the spatial movement of products and represent another source of value added beyond the farm gate. The way the border price is adjusted for transportation costs depends on whether the product is imported or exported (Diagram 4.1). In the case of import, the first step is to add to the CIF price the costs of transporting the product from the border to the internal wholesale market (\(T_{WWh}\)). This first step is necessary in order to account for the full cost of an import at the domestic market level. The second step is to subtract from this price the cost of transporting the product from the wholesale market to the farm gate (\(T_{FG}\)). This is necessary to express the price of an import in farm gate equivalent terms. The marketing margin adjustment to the CIF price, which also takes into account processing costs, is thus expressed as:
139.  \[ \text{CIF}_i^* = \text{CIF}_i + T_{WH} - T_{FG} - P \]  

where:  
\( \text{CIF}_i^* \) – CIF price of imported product \( i \) adjusted to the farm gate (reference price)  
\( T_{WH} \) – handling and transportation costs between border and domestic wholesale market  
\( T_{FG} \) – handling and transportation costs between wholesale market and the farm gate  
\( P \) – costs of processing farm product into imported product \( i \)  

140.  In the case of export, an FOB price is adjusted only downwards to the farm gate so as to exclude all internal transportation costs incurred between the farm gate and the border. The marketing margin adjustment in the case of an export is expressed as follows:

141.  \[ \text{FOB}_i^* = \text{FOB}_i - T_{WH} - T_{FG} - P \]  

where:  
\( \text{FOB}_i^* \) – FOB price of exported product \( i \) adjusted to the farm gate (reference price)  
\( T_{WH} \) – handling and transportation costs between border and domestic wholesale market  
\( T_{FG} \) – handling and transportation costs between wholesale market and the farm gate  
\( P \) – costs of processing of farm product into exported product \( i \)  

142.  All cost elements of the margin adjustment should be those of the country concerned (whether an importer or exporter) and not the costs reflecting the market structures of another country.  

143.  There can be difficulties in obtaining reliable or regular data on marketing costs that justify simplifications. A standard simplification relates to adjustments of the CIF price. As can be seen from equation 4.21, one element of the transportation costs \( (T_{WH}) \) increases the reference price, while another \( (T_{FG}) \) reduces it. This allows for the assumption that these costs offset each other, a simplification actually applied in the majority of cases where CIF prices are used. Adjustment for processing costs can be minimised (or omitted) by selecting external prices for products that are minimally transformed.

4.5.4 Weight adjustment

144.  As farm products undergo physical treatment before they are traded, typically more than one unit of weight of a farm gate product is required to obtain one unit of weight of a traded product. For example, one tonne of boneless beef requires the processing of approximately 1.9 tonnes of live animal. Hence, border and farm gate prices may not be directly comparable in the sense that they reflect different quantities of a farm gate product (or alternatively, they reflect different quantities of a traded product). For comparisons to be accurate, the two prices need to be expressed in the same weight equivalent, either in terms of the farm gate commodity or the traded product. In the example given this is achieved either by dividing the price of boneless beef by 1.9 or, alternatively, multiplying the live animal price by 1.9 (both methods yield the same price gap result). It is also important to ensure that all quantity variables used in calculations \( (e.g. \) quantity of production and consumption) are expressed in the same weight equivalent as that applied for prices.
4.5.5. Quality adjustment

The domestic market and border prices used to estimate the MPD should represent commodities/products of similar quality. Quality relates to such product attributes as size, colour, moisture level, protein, fat or oil content, degree of impurities, bacterial pollution, etc. Among other factors, these determine commodity prices and cause price differentials, which emerge independently of price policies. The measured MPD should be free from the “noise” which is due to quality differences, implying that the border price should be comparable with the domestic price in terms of product quality.

A quality differential should not be confused with price differences that reflect the degree of processing that the commodity has undergone. For example, prices for meat can be expressed in terms of carcass meat, meat with bone, or boneless meat. Each of the three prices represents three different stages of processing, and the corresponding price differentials are due to the value added at each stage and the physical transformation of product although each price may represent meat obtained from the same animal and therefore reflecting the same product quality.

For the majority of MPD estimates, no quality adjustment is made, indicating that it is generally assumed that the quality composition of domestic and traded commodities/products is reasonably comparable. However, there are a few cases when specific adjustments to the border price are made to bring it closer to the domestic producer price in terms of one or several quality characteristics. The way in which the adjustment is carried out largely depends on the type of quality characteristics affecting the price levels and data availability.

Example 1: MPD based on weighted average for different market segments. An MPD is estimated for the various market segments and an average MPD is calculated by weighting each segment MPD by the share of that segment in domestic production. This method can only be used when both domestic and border prices are available for products of different qualities.

This method, for example, is used to estimate the MPD for beef and veal in Switzerland where veal represents about 40% of the total value of beef and veal production. The MPD for beef and veal is the weighted average of the MPDs estimated individually for veal and beef:

\[
MPD_{BF} = MPD_V \times \frac{VP_v}{VP_{BF}} + MPD_B \times \frac{VP_b}{VP_{BF}}
\]  

[4.23]

where:
- \(MPD_{BF}\) – weighted average MPD for beef and veal
- \(MPD_V\) – MPD based on prices for veal
- \(MPD_B\) – MPD based on prices for beef (cows, bulls, steers and heifers)
- \(VP_v\) – Value of veal production
- \(VP_b\) – Value of beef production (cows, bulls, steers and heifers)
- \(VP_{BF}\) – Total value of beef and veal production

When the average quality of commodities produced domestically is very different from the quality of commodities available at the border, there are two possible options to compare like with like.

Example 2: applying a quality adjustment coefficient to the border price to bring it to a comparable level of quality with the domestic price. This method is used to estimate the MPD of wheat for
Ukraine, which is a net exporter of wheat. The MPD is estimated based on a differential between the Ukrainian average domestic and export prices of wheat. Feed wheat typically accounts for the majority share of the Ukrainian exports, while domestic production is relatively evenly distributed between milling and feed quality wheat. In order to eliminate the impact of such quality asymmetry on the levels of average domestic and export prices and therefore, on the measured MPD, the reference price is adjusted as follows:

\[ BP_{WT}^* = BP_{WT} \times QA \]  \hspace{1cm} [4.24]

where: \( BP_{WT}^* \) – border price with quality adjustment
\( BP_{WT} \) – border price before quality adjustment
\( QA \) – quality adjustment coefficient

152. The quality adjustment coefficient (QA) in equation 4.24 is derived as follows, assuming that:

\[ PP_{WT} = a \times PP_{feed} + b \times PP_{mill} \]  \hspace{1cm} [4.25a]
\[ BP_{WT} = c \times BP_{feed} + d \times BP_{mill} \]  \hspace{1cm} [4.25b]
\[ BP_{mill} = (1 + \Delta q) \times BP_{feed} \]  \hspace{1cm} [4.25c]
\[ BP_{WT} = c \times BP_{feed} + d \times (1 + \Delta q) \times BP_{feed} = BP_{feed} \times (c + d \times (1 + \Delta q)) \]  \hspace{1cm} [4.25d]
\[ BP_{WT}^* = a \times BP_{feed} + b \times (1 + \Delta q) \times BP_{feed} = BP_{feed} \times (a + b \times (1 + \Delta q)) \]  \hspace{1cm} [4.25e]
\[ QA = \frac{BP_{WT}^*}{BP_{WT}} = \frac{a + (b \times (1 + \Delta q))}{c + (d \times (1 + \Delta q))} \]  \hspace{1cm} [4.25f]

where: \( PP_{WT} \) – domestic producer price
\( BP_{WT} \) – border price before adjustment
\( a, b \) – shares of feed and milling wheat in domestic production respectively
\( c, d \) – shares of feed and milling wheat in exports respectively
\( PP_{feed} \) and \( PP_{mill} \) – domestic producer prices for feed and milling wheat respectively
\( BP_{feed} \) and \( BP_{mill} \) – export prices for feed and milling wheat respectively
\( \Delta q \) – price premium for milling quality wheat

153. As is seen from the equation 4.25e, the adjusted border price is a weighted average of reference prices for feed and milling wheat with weights \((a \text{ and } b)\) equal to the shares of feed and milling wheat in domestic production. It is assumed that the quality premium for milling wheat \((\Delta q)\) is the same for both domestically marketed and exported grain. Calculation of the quality adjustment coefficient requires information on the composition of domestic production and exports in terms of feed and milling wheat (coefficients \(a, b, c,\) and \(d\)) and the quality price premium for milling wheat \((\Delta q)\). It is possible to extend the formula to include any number of quality grades if relevant.
Example 3: use of weighted average of border prices for specific quality grades. Brazil is a net exporter of coffee. A higher-priced Arabica coffee accounts for around 90% of Brazilian exports and a lower-priced Robusta coffee for the remaining 10%. The shares of these two groups in domestic production are around 75% and 25% respectively. The difference in the quality composition of domestic production and exports is tackled by constructing a weighted average reference price, as follows:

\[ BP_{CF} = FOB_A \times \frac{QP_A}{QP_{CF}} + FOB_R \times \frac{QP_R}{QP_{CF}} \]  

[4.26]

where: 

- \( BP_{CF} \) – Weighted average border price of coffee
- \( FOB_A \) – Export price of Arabica coffee
- \( FOB_R \) – Export price of Robusta coffee
- \( QP_A \) – Quantity of Arabica coffee produced
- \( QP_R \) – Quantity of Robusta coffee produced
- \( QP_{CF} \) – Total quantity of coffee produced

The border price in equation 4.26 represents a weighted average of the Robusta and Arabica export prices, with weights corresponding to the shares of these two groups in domestic production. This method requires the existence of border prices for products of specific quality grades.

4.6. Alternative methods for calculating an MPD

Two alternative methods that do not use a price gap methodology are sometimes used to estimate an MPD for a commodity.

In a net export situation, if the country has significant levels of exports of a commodity and uses export subsidies to bridge the gap between domestic and world prices, the level of export subsidy per tonne of exports is an alternative method to estimate the MPD. In this case, the MPD can be expressed as:

\[ MPD_i = \frac{XS_i}{QX_i} \]  

[4.27]

where:

- \( XS_i \) – value of export subsidies for commodity \( i \) or products derived from \( i \)
- \( QX_i \) – level of exports of the commodity \( i \) for the annual period

This method is used to calculate the MPD of several commodities (barley, eggs, pigmeat, poultry, rice and wheat) for the United States, where the value of export subsidies is derived from expenditures by commodity on the Export Enhancement Programme (EEP). The same approach is also applied in the case of wine for the European Union.

The alternative method in the case of a net import situation is to derive the MPD directly from tariffs. This method is not a preferred option if other MPS policies such as tariff quotas, licensing or state-trading enterprises be in place because it does not capture the extent to which these policies change domestic market prices. However, it can be used even when other policies exist if price data is unavailable or unreliable and it is believed that deriving an MPD by this method results in a more accurate estimate of MPS for the commodity. The MPD can be expressed as either:
\[ MPD_i = PP_i \times \frac{tr_i}{(1 + tr_i)} \]  \hspace{1cm} [4.28] 

where: \( tr_i \) – average \textit{ad valorem} tariff applying to commodity \( i \) 

or 

\[ MPD_i = TR_i \]  \hspace{1cm} [4.29] 

where: \( TR_i \) – average specific tariff applying to commodity \( i \) 

160. The most appropriate tariffs to use are the \textit{statutory applied MFN tariffs} that would pertain to imports: \textit{statutory} rather than collected tariff revenue, as the latter ignores prohibitive tariffs that do not yield any revenues; \textit{applied} rather than WTO bound tariffs as they are the tariffs effectively protecting the market and can be significantly different from bound levels; and \textit{MFN} rather than preferential tariffs as they represent the protection level imposed on marginal imports. 

161. Commodities are traded at various degrees of processing and packaging that correspond to different tariff lines which may have significantly different tariff rates. In addition, for some commodities that have a limited shelf live, tariffs can vary by season (Box 4.1). Consequently there are two major steps that must be carried out in order to calculate an average tariff for a commodity. 

162. The first step is to ensure that the tariffs applying to imports of the commodity are expressed in the same form. Statutory tariff rates can be \textit{ad valorem} or specific. Sometimes they are a mixture of both. To average several tariff lines, all tariffs have to be converted to either an \textit{ad valorem} equivalent or a specific equivalent. The appropriate border prices to use for tariff conversion should be those corresponding to the specific tariff lines. But if the information is not available, e.g if no trade occurs because the tariff is prohibitive, an alternative price has to be used. For example, another indicator of the world price of the same product, the border price of a close tariff line or the border price of the commodity itself converted in the appropriate processing equivalent. 

163. The final step is to apply an appropriate weighting to the tariffs. If significant flows of trade occur for all tariff lines, tariffs can be weighted by import volumes, ensuring that volumes have been converted to the same product weight. However, if there are no imports for some tariff lines, for example because of prohibitive tariffs, another weighting system has to be used, usually a simple average.
Annex 4.1

The Methodology for Calculating the Border Price for Milk

Introduction

164. Since fluid milk is not normally a tradable commodity, a border price is not directly observable. Consequently, from the early 1980s through to 2004 the annual reference price for milk in each country was derived from a New Zealand farm gate milk price, adjusted for country differences in milkfat content and transportation costs. In 2005 a new methodology was introduced and has been used to recalculate annual indicators back to 1986.

165. The key idea of the new method is to derive a reference price from border prices of representative, tradable dairy products. This method is based on two assumptions. First, world markets for tradable dairy commodities are competitive. This allows the formation of a single price for each of the solid components (milkfat, protein, lactose, etc.) of raw milk. Second, each type of dairy product contains unique and fixed amounts of each of these solid components of milk.

166. The issue is which tradable dairy products are to be selected. To have a meaningful comparison between domestic and border prices, selected dairy products should be common, tradable products in global dairy markets. From this criterion, butter and skim milk powder (SMP) were selected. Reference prices for most countries are calculated using these two products. As a variation of the method, cheese was selected in addition to the above two dairy products if the policy, trade or other factors in particular countries were such that adding additional products would increase the accuracy of the calculation. The reference price for milk in the EU and Switzerland is calculated using this variation.

Measuring the implicit border price of raw milk

Two dairy products (butter and SMP) case

167. Two solid components in dairy products – milkfat and non-fat-solids – are considered. First, the implicit prices of the two components are calculated from the border prices of butter and SMP, and the percentage of fat and non-fat-solids in these two products. The appropriate border prices to use for butter and SMP follow the general procedure for selecting a border price for any other commodity, i.e. depending on whether the country is a net exporter or importer of the product (as to whether an FOB or CIF price is used) and the regularity and quantity of product traded (as to whether the country’s own or another country’s CIF or FOB prices are used).

168. The implicit prices of milkfat and non-fat-solids are calculated by solving the following equations.

\[
\begin{align*}
aX + cY &= P_{wb} \\
bX + dY &= P_{ws}
\end{align*}
\]
where \( X \) and \( Y \) are the implicit prices of milkfat and non-fat-solids respectively, \( a \) and \( b \) are the milk fat contained in one tonne of butter and SMP respectively, \( c \) and \( d \) are non-fat-solids contained in one tonne of butter and SMP respectively, \( P_{wb} \) and \( P_{ws} \) are butter and SMP prices at the border of the country in question respectively.

169. Solving the above equations results in:

\[
X = \frac{dP_{wb} - cP_{ws}}{ad - bc} \quad \text{and} \quad Y = \frac{aP_{ws} - bP_{wb}}{ad - bc}
\]

170. The implicit border price of raw milk can be written as \( P_{wm}^1 = eX + fY \) where \( e \) and \( f \) are the milkfat and non-fat-solids contained in one tonne of raw milk respectively.

Using results of \( X \) and \( Y \), \( P_{wm}^1 \) can be written as:

\[
P_{wm}^1 = \alpha P_{wb} + \beta P_{ws}
\]

where \( \alpha = \frac{de - bf}{ad - bc} \) and \( \beta = \frac{af - ce}{ad - bc} \)

**Three dairy products (butter, SMP and cheese)**

171. Where three dairy products are used, three main solid components are considered: milkfat, protein and lactose. From the border prices of the three dairy products and their percentage of milkfat, protein and lactose, the implicit prices of three solid components are calculated. The implicit border price of raw milk can be calculated from these three implicit prices and the percentage of the three solid components in raw milk.

172. In equation form, the implicit raw milk price can be written as:

\[
P_{wm}^2 = eX + nZ + oW
\]

where \( X, Z \) and \( W \) are implicit prices of milkfat, protein and lactose respectively, at the border, and \( e, n \) and \( o \) are the tonnes of milkfat, protein and lactose contained in one tonne of raw milk respectively.

173. From the information about the composition of the three dairy products, the implicit prices of the three components can be estimated as the solution of the following equations.

\[
\begin{bmatrix}
a & h & k \\
b & i & l \\
g & j & m
\end{bmatrix}
\begin{bmatrix}
X \\
Z \\
W
\end{bmatrix} =
\begin{bmatrix}
P_{wb} \\
P_{ws} \\
P_{wc}
\end{bmatrix}
\]

where \( a, b \) and \( g \) are the tonnes of milkfat contained in one tonne of butter, SMP and cheese respectively; \( h, i, \) and \( j \) are the tonnes of protein contained in one tonne of butter, SMP and cheese respectively; \( k, l, \) and \( m \) are the tonnes of lactose contained in one tonne of butter, SMP and cheese respectively; \( P_{wc} \) is the cheese price at the border.
174. Applying Cramer’s Rule obtains:

\[
\begin{align*}
X &= \frac{P_{wa}(im-jl) + P_{wa}(jk-hm) + P_{wa}(hl-ik)}{aim + ghl + bjk - ajl - bhm - gik} \\
Z &= \frac{P_{wa}(gl-bm) + P_{wa}(am-gk) + P_{wa}(bk-al)}{aim + ghl + bjk - ajl - bhm - gik} \\
W &= \frac{P_{wa}(bj-gi) + P_{wa}(gh-aj) + P_{wa}(ai-bh)}{aim + ghl + bjk - ajl - bhm - gik}
\end{align*}
\]

Using the above results, \( P_{wm}^2 \) can be rewritten as:

\[
P_{wm}^2 = \gamma P_{wb} + \delta P_{ws} + \epsilon P_{wc} \quad \text{where } \gamma, \delta \text{ and } \epsilon \text{ are defined as:}
\]

\[
\gamma = \frac{e(im-jl) + n(gl-bm) + o(bj-gi)}{a(im-jl) + h(gl-bm) + k(bj-gi)}
\]

\[
\delta = \frac{e(jk-hm) + n(am-gk) + o(gh-aj)}{b(jk-hm) + i(am-gk) + l(gh-aj)}
\]

\[
\epsilon = \frac{e(hl-ik) + n(bk-al) + o(ai-bh)}{g(hl-ik) + j(bk-al) + m(ai-bh)}
\]

Processing margin

175. The above implicit border price includes marketing margins, since it is derived from processed dairy products. Therefore, the margin must be subtracted from the implicit border price in order to obtain the reference price. However, in most countries data on marketing margins is not available from official statistical sources. As a practical alternative, the implicit wholesale price of raw milk is calculated from the wholesale prices of butter and SMP in the same way as the implicit border price of milk was calculated from the border prices of butter and SMP. The processing margin is obtained by subtracting the manufacturing milk price from the implicit wholesale price of raw milk. In equation form, processing margin \( C \) can be written as:

\[
C = (\alpha P_{wb} + \beta P_{ws} - P_m) \quad \text{where } \alpha = \frac{de-bf}{ad-bc} \text{ and } \beta = \frac{af-ce}{ad-bc}
\]

where \( P_{wb} \) and \( P_{ws} \) are butter and SMP prices in the domestic wholesale market and \( P_m \) is the domestic manufacturing milk price.

176. The next issue concerns the choice of the marketing margin. It is assumed that the average marketing margin of butter and SMP in four countries — Australia, the European Union, New Zealand and the United States — is the representative marketing margin. Because a large proportion of world dairy exports comes from these four countries, this seems a reasonable approximation. For those four major exporting countries themselves, their own marketing margins are used to make the adjustment.
The reference price

177. The reference price for milk is obtained by subtracting the marketing margin from the implicit border prices of raw milk. Milk reference prices for countries other than the four major exporting countries can be written as:

\[ P_{rp}^1 = (\alpha P_{wb} + \beta P_{wm}) - C \]  
\[ P_{rp}^2 = (\epsilon P_{wb} + \delta P_{wm}) - C \]

where \( C \) is the average of the processing margins for butter and SMP in Australia, the European Union, New Zealand and the United States.

178. Since their own processing margins are used in the major exporting countries, their reference prices can be written as:

\[ P_{rp}^1 = (\alpha P_{wb} + \beta P_{wm}) - C \]  
\[ P_{rp}^2 = (\gamma P_{wb} + \delta P_{wm}) - C \]
CHAPTER 5.

ESTIMATING POLICY TRANSFERS:
OTHER TRANSFERS

179. This chapter completes the discussion of policy transfers, focusing on transfers that emerge from policies 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.

5.1. Budgetary transfers

- Budgetary transfers through all government institutions and coming from both national and sub-national governments are included.
- Budgetary transfers are allocated to calendar years, and in cases where agricultural, fiscal and calendar years do not coincide, various procedures are needed to attribute transfers appropriately.
- Budgetary transfers associated with the administration of policies (design, implementation and evaluation) are not included in the estimates of support.
- Care should be taken to avoid double counting of support, in particular in treating budgetary transfers associated with market price support policies.

180. Budgetary transfers are the most “visible” policy transfers. They are observed and do not need to be estimated as is the case with the price transfers or support based on revenue foregone. The measurement of direct budgetary transfers is an accounting task, which consists of the appropriate use of information on budgetary spending. This section details the main procedures for accounting for budgetary transfers in support estimation.

5.1.1. Complete coverage of institutions, administrative levels and financing instruments

181. The first step is to identify all budgetary expenditures underlying policies which support agricultural production – whether provided to producers individually, producers collectively, or consumers of agricultural commodities. The principle of complete identification of all publicly financed transfers has three aspects:

- First, all financing through public institutions involved should be captured, paying attention to the fact that implementation and funding of some agricultural measures may be outside the remit of agricultural ministries. This often concerns general services for agriculture, such as agricultural education, research, pest and disease control, or infrastructural development. Another example is agri-environmental measures which may be implemented by and financed through the ministries and agencies specifically responsible for environmental issues.

- Second, funding from all administrative levels should be covered. Agricultural policy measures are financed at multiple levels of government. For example, in a country with a Federal government structure, national, as well as state, province or prefecture level support should be covered, as well as measures that are financed more locally, for example counties, communes or townships. By convention, all expenditures beneath the national level are termed sub-national.
Also by convention, EU-level expenditures are considered the national level, with EU country expenditures (including those made at regional levels), the sub-national level. Some policies, such as elements of Rural Development policy, are co-financed across several levels of government, with the EU budget financing part of the costs of a programme, augmented by expenditure from an EU country government’s budget, with the possibility of additional expenditure by a regional or local government entity within that country.

- Third, all public finance instruments should be covered. In some non-OECD countries, for example, such as Brazil and Russia, agricultural support may also be financed from the so-called extra-budget funds – instruments which do not formally constitute part of the national budgets. Such funds may be created at the national or regional level and are usually used for implementation of specific programmes.

5.1.2. Accounting of effectively disbursed funds

182. Data on effectively disbursed – as opposed to planned or budgeted funds – should be used. The principle is to capture transfers that actually affect producer revenues. The difference between budgeted and effectively disbursed outlays can be large, for example when emergency assistance is provided over and above the initial budget appropriation, or in the case of deficiency payments, when there is considerable under-spending due to favourable market conditions. It is important to ensure that all spending items are accounted for consistently in terms of amounts effectively disbursed. However, if the estimations are done on an annual basis, such information may not be available in time for the latest year – in this case data on budgeted expenditures are used, which are then adjusted the following year to reflect actual spending.

5.1.3. Treatment of policy administration costs

183. Administration costs include those associated with the design, implementation and evaluation of agricultural policies. It is important to distinguish different types of budgetary expenditures related to administration of agricultural policies:

- Administrative expenditures by ministries, including staff salaries, material, building and other costs.
- Salaries and wages of those employed in research, inspection, extension and other services.
- Payments to banks, insurance companies, producer organisations or commodity boards to cover their costs associated with implementing support policies.

184. The principle is to exclude administrative expenditures of the ministries from the estimation of support as they represent expenditures on operations common to any public structure and are not policy transfers as such. However, when the policy measure is actually delivering a service that benefits producers individually (e.g. extension) or collectively (e.g. research and inspection), expenditures associated with the delivery of the service, mainly the salaries of extension advisors, inspection officers, researchers, etc., are included in the PSE and the GSSE respectively.

185. In some countries, the government grants other agencies (public, mixed or private bodies) responsibility for implementing some agricultural policy measures. Commodity boards can be in charge of intervention and storage measures. Producer organisations may be involved in policy implementation. Banks may deliver agricultural investment loans with preferential conditions (generally interest concessions) and in many countries, insurance companies deliver subsidised insurance programmes. Consulting companies or NGOs can help farmers prepare applications for project-based measures.
186. When policies are delivered by semi-public or private companies, the government may compensate them for part or all of the costs associated with implementing the policy measure, in addition to channelling support to farmers through these organisations. As in the case of direct delivery by ministry officials, these implementation costs are excluded from the PSE. In the case of investment and insurance programmes, the government may pay for two components: support to farmers (e.g. interest concession on loans or a subsidy to insurance premia), as well as the programme administration costs, which are transfers to the implementation agencies. Those two cost components are usually identified in the programme. The first one is included in the PSE while the other is not.

5.1.4. Avoiding double counting of support: an example of outlays on price regulation

187. In the work with budgetary expenditures special care should be taken to avoid double counting of support in the PSE. This risk exists when budgetary expenditures underlie support, which has already been included elsewhere. The clearest example is budgetary expenditures related to domestic price interventions. Several such expenditures can be distinguished: (a) intervention purchases; (b) export subsidisation (outlays on export subsidies, export credits or food aid); (c) price subsidies (deficiency payments); (d) payments for on-farm stockholding; (e) and outlays for public stockholding, which include operational costs of public purchasing agencies and depreciation and disposal costs associated with public stocks; (f) compensatory payments to consumers, or subsidies to the first purchasers of agricultural commodities – mills, dairies, slaughterhouses, etc. – provided to reduce the burden imposed on them by agricultural price support.

188. When the Market Price Differential (MPD), and consequently, the price transfers are estimated by comparing domestic and border prices, outlays for intervention purchases (group (a) above) or export subsidies (group b), if they are applied, should not be included in the PSE. The purpose of these expenditures is to raise the level of domestic prices and this support is already captured through the price gap. Inclusion of groups (a) and (b) in the budgetary part of support in this case would create double counting with price transfers. When the MPD is estimated based on per tonne deficiency payments (group c) or per tonne export subsidies (group b) – these budgetary items represent direct input into estimation of price transfers, and also should not appear in the budgetary transfers. The groups that should be accounted in the budgetary transfers are: payments for on-farm stockholding (group e), classified in PSE category B3, “Payments based on input use, on-farm services”; expenditures on public stockholding (group d), classified in GSSE category M, “Public stockholding”; and compensatory payments to consumers (group f), classified in the CSE as a Transfers to Consumers from Taxpayers (TCT).

5.1.5. Attribution of budgetary allocations to calendar years

189. Support estimates are made on a calendar year basis and, as such, budgetary expenditures should be allocated to calendar years. This may not be straightforward, as some support programmes have cycles that correspond to crop (agricultural) years, while the budgetary funding is based on fiscal years. As a result, calendar, crop and fiscal years may not fully coincide, i.e. they may cover different time laps. The principle is to allocate a payment of a particular crop year to the calendar year to which the production of that crop year is attributed. For example, a crop year $t$ starts in calendar year $t$, and the crop is harvested and thus attributed to calendar year $t$. However, payment with respect to crop year $t$ is made on the basis of the fiscal year and falls mostly upon calendar year $t+1$. In this case, payment made in calendar year $t+1$ should be allocated to calendar year $t$ because the crop for which the payment was made is attributed to that calendar year. With decoupling, the rule is extended to cover payments with respect to land in agricultural use at given dates or for environmental actions taken over specific periods. For example, if a payment is based on land in agricultural use or animals held at a given date, it would be assigned to the calendar year in which this date occurs.
5.1.6. Classification of budgetary spending

190. Once all budgetary spending items are identified, adjusted and allocated to appropriate years, they should be attributed to and then classified to the three main categories of support – support to producers individually (PSE), financing of general services to agriculture (GSSE), and support to consumers (CSE). This task is treated in detail in Chapter 3. One specific problem which may be encountered in classifying expenditures is that the budgetary data reported is too aggregated to be directly allocated to a particular category, for example, when the data are presented by broad agricultural programmes or by implementing agencies – groupings that are heterogeneous and combine various types of expenditures. In such cases it is important to make an attempt to obtain disaggregated data. If additional information is not available, then some form of allocation key is required to allocate the spending items to individual policy measures.

5.2. Support based on revenue foregone

• Producers can 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 forgone are tax concessions, preferential lending, debt restructuring, and administered prices for inputs and services.
• A price gap method, similar to that used to estimate MPD, is often the most appropriate method. However, selecting an appropriate reference variable may be difficult.

191. Support may be provided in forms that do not imply actual budgetary transfers, but at the cost of revenue foregone by the government or other economic agents. Such support creates implicit transfers to producers – and should also be identified and quantified. This section presents several types of support based on revenue foregone currently covered in support estimations. Approaches to quantify the associated policy transfers are also discussed. The measurement of transfers based on revenue foregone is largely an empirical task, involving assumptions and judgement about the appropriate reference against which to measure the transfer. A good understanding of implementation mechanisms underlying such policies and the broader economic context are prerequisite.

5.2.1. Tax concessions

192. Tax concessions are a common type of support to agricultural producers that generate budgetary revenue foregone. Concessions may apply to taxes on income, profits and capital gains, real estate and land. Agricultural producers may be granted preferential treatment on VAT (e.g. applied to purchased inputs), on fuel taxes, or on depreciation methods. Farm operators may benefit from preferential treatment on taxes on payroll. The principle of consistent coverage of all policy measures supporting agriculture means that tax concessions should be included in estimated support when they are agriculture-specific or when agricultural producers are their principal beneficiaries. Tax concessions occur when a fiscal advantage is conferred on a group of individuals, or a particular activity, by reducing tax liability rather than by direct cash subsidy (James and Nobles, 1992). Tax concessions can come in various forms of special treatment that relate to one of the basic features that characterise the structure of a tax. These can be formulated as follows:

• Exemptions: amounts excluded from the tax base.
• Allowances: amounts deducted from the benchmark to arrive at the tax base.
• Credits: amounts deducted from tax liability.
• Rate relief: a reduced rate of tax applied to a class of tax payers or taxable transactions.
• Tax deferral: a relief that takes the form of a delay in paying tax.
193. Each of these forms imply that some tax revenue is forgone and economic incentives provided in much the same way as would happen had a programme involving budgetary expenditure been used.

194. The definition of a tax concession given above presumes a counterfactual, \textit{i.e.} the existence of a group of individuals or activity for which no such fiscal advantage is given. The support associated with preferential taxation can therefore be measured by establishing a counterfactual and quantifying the monetary value of the reduction in tax liability against that counterfactual.

195. A complete and reliable quantification of tax concessions is therefore a complex empirical task, requiring a considerable amount of resources and information. Very few countries themselves calculate the value of tax revenue foregone. An approach has been adopted to limit the coverage of tax concessions to those that unambiguously confer benefits on agriculture, and the value of which can be estimated at reasonable cost and with reasonable accuracy.

196. In this context, a special effort has been made to estimate the value of the fuel tax concession to cover all countries where such policy exists. This choice reflects the fact that this policy occurs in many countries and is relatively easily measured. Other tax concessions covered in the current indicator database relate to income tax (\textit{e.g.} in Australia, Mexico, Norway and the United States) and to property tax exemption (in Canada). The monetary estimates of related concessions are provided by the countries and are usually based on information from ministries of finance.

197. Agricultural producers are often treated differently than other citizens with respect to the social security systems. The differences may concern the principles of participation (voluntary or compulsory), contribution rates, and entitlement. In some cases this may result in preferential treatment. However, by convention these issues are not covered within the framework of measured support, because the level of special treatment is difficult to establish. For example, transfers may reflect the demographic structure of the farm population, rather than a concession as such. Therefore, no attempt is made to estimate transfers associated with differentiated social security treatment or with any other social benefits accorded to agricultural producers.

5.2.2. Preferential lending

198. Governments often intervene to reduce the cost of borrowing for agricultural producers. When agricultural producers are enabled to borrow at favourable terms compared to other businesses, transfers are created, which need to be accounted for in producer support.

199. Some governments subsidise interest rates charged to agricultural borrowers. The lending banks receive a budgetary compensation which covers part of the interest rate due on agricultural loans. This describes preferential lending in a number of OECD and non-OECD countries. In these cases government spending can be used as a measure of the related policy transfers.

200. In some cases governments rely on mechanisms of credit support that do not generate budgetary spending. Special conditions may apply, such as fixed or minimum interest rates; credit institutions may be required to direct certain amounts of credit to agriculture. When such policies are implemented through state-owned lending institutions, the interest lost is a form of budgetary revenue foregone. Sometimes private lenders are also obliged to apply reduced interest rates to agricultural loans and allocate certain amounts of their credit for such lending. In this case provision of preferential credit is based on administrative regulation, and the associated support to agricultural borrowers is provided at the cost of revenue foregone by private lenders (who most likely cross-subsidise these operations through other lending). This situation is characteristic of Brazil where a large share of agricultural loans is provided under the administrative control. When government sets interest rates and directs resources for lending
administratively, without compensation, the associated support needs to be estimated. For OECD countries the estimates are provided by member countries, while for non-OECD countries estimations are carried out by the OECD.

201. The approach used is similar to a price gap measurement, with the preferential interest rate compared to a reference (opportunity cost) rate. The transfers arising from preferential lending (TPL) are equal to the interest rate differential multiplied by the amount of credit, more formally expressed as follows:

\[
TPL_Y = \sum (i_r - i_p) \times L_t
\]

[5.1]

where:

- \( Y_{TPL} \) – policy transfers from preferential lending accumulated over a year \( Y \)
- \( r \) – reference interest rate at point of time \( t \) in year \( Y \)
- \( p \) – preferential (controlled) interest rate at point of time \( t \) in year \( Y \)
- \( L_t \) – value of outstanding preferential debt at point of time \( t \) in year \( Y \)

202. The value of the outstanding debt (\( L_t \)) is a stock value corresponding to a specific point in time. \( TPL_Y \) in Formula 5.1 is the sum of discrete values of interest foregone estimated for a number of time points in a given year. In order to capture most accurately the annual value of TLP, as many time points as possible should be included, e.g. the monthly data on outstanding credit and interest rates.

203. Information on the value of the outstanding debt may only be available on a quarterly or annual basis. It is possible to interpolate these data to obtain monthly estimates of outstanding debt by applying some assumptions on the evolution of the debt between the two known points in time. If data on outstanding debt is not available, information on the amount of new preferential loans may be used. It is possible to estimate the amount of outstanding credit by using these data and information on the standard time structure of these loans.

204. Estimation of transfers associated with preferential lending demands good knowledge of agricultural lending conditions, which may vary by lending programmes and types of beneficiaries and may be subject to frequent changes. It is also important to have adequate information on the values of outstanding debt and/or allocations of new preferential loans. A choice of appropriate reference interest rate to represent the opportunity cost for preferential credit requires judgement based on overall knowledge of credit markets in a given country.

5.2.3. Agricultural debt concessions

205. Agricultural producers sometimes benefit from debt concessions provided by the government to overcome problems of bad debts, or as part of a reform package, etc. Agricultural debt forgiveness has occurred, for example, in Australia, Canada, Mexico, New Zealand, and some EU member-states. Non-OECD countries, such as Brazil, Russia, Romania and Ukraine, saw severe farm finance crises in the period of transition to the market economy. The governments responded by large-scale restructurings of accumulated bad debt, often followed by further restructurings involving additional bad debts, and/or repackaging of previous schemes.

206. Debt concession schemes can may also involve extensions of repayment periods, reduced interest on overdue debt, and partial write-offs. These concessions create transfers to debtors, which need to be quantified and included in the estimation of support, irrespective of what caused the accumulation of debt and the objectives which led the government to restructure it. For OECD countries, the estimates are
usually provided by the countries themselves, while for non-OECD countries, estimations are carried out by the OECD.

207. The quantification of transfers associated with debt rescheduling, through the extension of the repayment period and/or reduced interest, is also based on estimating the interest foregone, as applied to preferential lending of the type discussed in sub-section 5.2.2. Equation 5.1 can be used, where \( i_r \) is set at zero over the period of debt non-repayment, while for the period of repayment of the restructured debt the rate that is applied for such repayments (usually a preferential rate set below the financial market level). The estimation requires the time series of outstanding overdue credit \( (L_t) \) and the relevant interest rates to calculate the interest rate differential. It is necessary to establish the time structure of overdue debt – the period over which it has accumulated and how its value has been evolving during the period, as well as the schedule adopted for the repayment. In addition, the interest rate set for the repayments \( (i_p) \) needs to be obtained and an adequate reference interest rate \( (i_r) \) selected.

208. As concerns the transfers associated with write-offs of capital, penalties and/or interest, these values are often officially reported and should also be captured in the measured support. However, care should be taken in attribution of the amounts to particular years. It would be incorrect to allocate a sum written off to one year when the writing off is implemented, as this sum represents debt accumulated over a number of years. The debt forgiven should be allocated retrospectively to the period over which it is known (or assumed) to have built up. In the absence of sufficient detail the written off debt can be allocated back to previous years based on the time structure of the total overdue debt subject to restructuring, or based on some other appropriate allocation principle.

5.2.4. Administered input prices

209. Agricultural producers may also be supported through the administration of prices for inputs and services such as energy, irrigation water and transportation. Governments, may impose upper price limits for inputs and services provided to agricultural buyers. Some inputs (e.g. electricity) may be supplied by state monopolies, which practice differentiated pricing, whereby agricultural buyers are charged prices below levels set for other users. Such policies are similar in nature to the provision of input subsidies. The associated transfer to producers per unit of input purchased is equivalent to the price reduction accorded to them compared to the price paid by a “reference” (alternative) buyer of the same input. This approach has been used in estimation of implicit support through reduced prices for electricity provided to agricultural producers in Russia. The associated transfer \( (TPEP) \) is estimated as follows:

\[
TPEP_Y = \left( PE_{\text{in}} - PE_{\text{ag}} \right) \times W_{\text{ag}} \tag{5.2}
\]

where: 
\( TPEP_Y \) – transfers to producers from preferential electricity price over a year \( Y \)
\( PE_{\text{in}} \) – average price per kwt/hour of electricity charged to industrial users in year \( Y \)
\( PE_{\text{ag}} \) – price per kwt/hour of electricity charged to agricultural users in year \( Y \)
\( W_{\text{ag}} \) – kwt/hours of electricity provided to agricultural users in year \( Y \)

210. The estimation of the implicit price discount depends on the establishment of a “reference buyer” and the extent to which prices charged to different buyers can be compared. Data quality and availability mean that estimating the value of transfers through the use of price gaps is not always possible. For example, in the case of support for water in agriculture, it is difficult to find a price charged to other sectors for water that has the same characteristics as water used for agriculture, e.g. in terms of quality, reliability or timing.
CHAPTER 6.

CALCULATING INDICATORS OF SUPPORT TO PRODUCERS

211. Indicators of support to individual producers are the most widely used of all the indicators. The procedure for calculating producer support indicators is summarised in Diagram 6.1. The process begins by calculating Market Price Support (MPS) for a number of individual commodities from which a national (aggregate) MPS value is extrapolated (section 6.1). This is then combined with the value of other transfers arising from policies that support individual producers to derive a value for the Producer Support Estimate (PSE) at the national level (section 6.2). From this value, the relative indicators, the %PSE and producer NAC are derived (section 6.3).

212. The PSE can be separated into four components representing different degrees of commodity specificity, i.e. transfer provided on the basis of single commodities e.g. wheat (SCT), a group of commodities, e.g. cereals (GCT), all commodities (ACT), or without obligation to produce commodities (OTC). Transfers to single commodities or groups of commodities are further distinguished at the individual commodity or groups of commodities level (section 6.4). From these values, the relative indicators, the producer NPC and %SCT can be derived for individual commodities and at the national level (sections 6.5 and 6.6).

Diagram 6.1. The procedure for calculating producer support indicators

---

Commodity or groups of commodities Level

- MPSi
- GCTx
- MPS
- PSE
- Producer SCTi
- Producer NPCi
- %SCTi
- %PSE and Producer NAC
- %SCT
- Producer NPC

Monetary indicators

Percentage indicators or ratios

National (aggregate) Level

- GCT
- ACT
- OTP
6.1. Market Price Support (MPS)

**Market Price Support (MPS):** the annual monetary value of gross transfers from consumers and taxpayers to agricultural producers, arising from policy measures that create a gap between domestic market prices and border prices of a specific agricultural commodity, measured at the farm gate level.

213. The conceptual basis for calculating MPS is described in sections 4.1 and 4.2. This section explains the procedure to calculate a national (aggregate) MPS based on MPS values for individual commodities.

6.1.1. MPS for individual commodities

214. The process begins by calculating individual commodity MPS values for a representative sample of commodities. A standard set of commodities is first considered – wheat (WT), maize (MA), other grains (OG)\(^{14}\), rice (RI), rapeseed (RS), soybean (SB), sunflower (SF), refined sugar (RS), milk (MK), beef and veal (BF), sheepmeat (SH), wool (WL), pigmeat (PK), poultry (PT) and eggs (EG). These are termed “standard MPS commodities” (SMC). See Annex table A6.1 for illustration.

215. These commodities were chosen initially because they represented a significant proportion of agricultural production in a large number of OECD countries, and support policies were mainly targeted to them. A standard set of commodities allows comparisons between countries not only at the national (aggregate) level but also at the individual commodity level or for subsets of commodities.

216. As individual commodity MPS values are used to calculate the national (aggregate) MPS for a country, they should represent a significant share of the total value of agricultural production in a country. In general, efforts are made to ensure that the sum of the value of production of the individual commodities for which MPS is calculated represents at least 70% of the total value of agricultural production on average over the previous three years. If production of a standard MPS commodity is very small, i.e. less than 1% of total value of production, MPS is not calculated for this commodity. If the sum of the value of production for the standard MPS commodities with the individual shares above 1% is less than 70% of the total value of agricultural production in a country, additional commodities are added until this threshold is reached. The combined group of commodities for which MPS is calculated, both standard and additional, are termed “All MPS commodities” (AMC).\(^{15}\)

217. Table 6.1 presents a country which produces only six of the fifteen standard commodities – wheat, barley (i.e. other grains), milk, beef and veal, poultry and eggs, so MPS cannot be calculated for the other nine standard commodities. Further, the value of production for both poultry and eggs is below 1% of the total value of production, and so MPS is not calculated for these two commodities either.

---

\(^{14}\) OG is considered as single commodity. In practice, however, it is a composite commodity that includes barely (BA), sorghum (SO), oats (OT) and/or rye (RY). Similarly, wheat in case of the EU is a composite commodity that includes durum wheat (DW) and common wheat (CW).

\(^{15}\) Note that this procedure for defining a representative set of commodities relates only to the MPS calculation. Other transfers (budgetary and revenue foregone) cover all agricultural commodities produced in the country.
Table 6.1. Selection of individual commodities for MPS estimation (example)

<table>
<thead>
<tr>
<th>Commodities</th>
<th>Value of production $ million</th>
<th>Shares in production %</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Individual</td>
<td>Cumulative</td>
</tr>
<tr>
<td>Wheat</td>
<td>515</td>
<td>22</td>
</tr>
<tr>
<td>Maize</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Other grains</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Barley</td>
<td>126</td>
<td>5</td>
</tr>
<tr>
<td>Oats</td>
<td>52</td>
<td>2</td>
</tr>
<tr>
<td>Rice</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Rapeseed</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Soybean</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Sunflower</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Sugar</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Milk</td>
<td>400</td>
<td>17</td>
</tr>
<tr>
<td>Beef and veal</td>
<td>250</td>
<td>11</td>
</tr>
<tr>
<td>Sheepmeat</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Wool</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Pigmeat</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Poultry</td>
<td>18</td>
<td>0.8</td>
</tr>
<tr>
<td>Eggs</td>
<td>16</td>
<td>0.7</td>
</tr>
<tr>
<td>Standard MPS commodities, sub-total (excl poultry and eggs)</td>
<td>1 343</td>
<td>58</td>
</tr>
<tr>
<td>Cotton</td>
<td>180</td>
<td>8</td>
</tr>
<tr>
<td>Potato</td>
<td>160</td>
<td>7</td>
</tr>
<tr>
<td>Additional MPS commodities, sub-total</td>
<td>340</td>
<td>15</td>
</tr>
<tr>
<td>All MPS commodities</td>
<td>1 683</td>
<td>72</td>
</tr>
<tr>
<td>Non-MPS commodities</td>
<td>642</td>
<td>28</td>
</tr>
<tr>
<td>Total value of agricultural production</td>
<td>2 325</td>
<td>100</td>
</tr>
</tbody>
</table>

218. The four standard commodities for which MPS is calculated (barley and oats treated as one commodity “other grains”) represent 58% of the total value of agricultural production. Additional commodities are thus needed to reach the 70% threshold. In this example, cotton and potatoes have important shares in the value of production. By adding these two commodities, the MPS is calculated for six commodities that together represent 72% of the total value of agricultural production. Annex Table 6.1 shows the individual commodities for which MPS is calculated (both standard and additional MPS commodities) for OECD and several non-OECD countries, as well as the aggregate share of these commodities in the total value of agricultural production.

219. Having defined the scope of commodities, the next step is to estimate the MPS for each commodity. The process begins with the estimation of MPDs, but first it is required to determine whether there are policies in place which create a price gap between domestic market and border prices of the commodity in question. If such policies are in place, an MPD is estimated based on the procedures explained in section 4.4. If there are no such policies in place for the commodity in question, the MPD for this commodity is set at zero.16 Note that commodities for which MPS is not calculated are different from those for which MPD is set at zero: the former are those with a share of production of less than 1%; the

16. MPD is also set to zero in some cases when it takes negative value (Box 4.1).
latter do not have policies affecting their market price. Once the MPDs have been estimated for all selected commodities, the Excess Feed Cost (EFC) and then the MPS are calculated (as described in section 4.2).

220. Tables 6.2 and 6.3 illustrate the procedure for calculating MPS and EFC for individual commodities. When “data” is indicated as a source in the last column, the variable comes from an original data input. The data required for the calculations are discussed in Chapter 10. The MPD is set to zero in the case of oats and potatoes. The quantity of feed consumed by livestock producers includes only domestically produced feed.

---

### Table 6.2. Calculation of MPS for individual commodities (example)

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Description</th>
<th>Units</th>
<th>Wheat</th>
<th>Barley</th>
<th>Oats</th>
<th>Milk</th>
<th>Beef</th>
<th>Cotton</th>
<th>Potatoes</th>
<th>Source/equation</th>
</tr>
</thead>
<tbody>
<tr>
<td>QPi</td>
<td>Level of production</td>
<td>000t</td>
<td>250</td>
<td>100</td>
<td>90</td>
<td>200</td>
<td>100</td>
<td>380</td>
<td>160</td>
<td>data or (QPi + QMi - QXi)</td>
</tr>
<tr>
<td>VPi</td>
<td>Value of production (at farm gate)</td>
<td>$ million</td>
<td>515</td>
<td>126</td>
<td>52</td>
<td>400</td>
<td>250</td>
<td>180</td>
<td>160</td>
<td>data or (VPi + PPi)</td>
</tr>
<tr>
<td>QCi</td>
<td>Level of consumption</td>
<td>000t</td>
<td>200</td>
<td>150</td>
<td>200</td>
<td>300</td>
<td>75</td>
<td>400</td>
<td>120</td>
<td>data or (QPi + QMi - QXi)</td>
</tr>
<tr>
<td>QMi</td>
<td>Imports</td>
<td>000t</td>
<td>50</td>
<td>50</td>
<td>150</td>
<td>100</td>
<td>0</td>
<td>40</td>
<td>0</td>
<td>data or (QPi + QMi - QXi)</td>
</tr>
<tr>
<td>QXi</td>
<td>Exports</td>
<td>000t</td>
<td>100</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>25</td>
<td>0</td>
<td>40</td>
<td>data or (QPi + QMi - QXi)</td>
</tr>
<tr>
<td>PPi</td>
<td>Producer price (at farm gate)</td>
<td>$/T</td>
<td>2 060</td>
<td>1 260</td>
<td>1 040</td>
<td>2 000</td>
<td>2 500</td>
<td>500</td>
<td>1 000</td>
<td>VPi / QPi or data</td>
</tr>
<tr>
<td>RPi</td>
<td>Reference price</td>
<td>$/T</td>
<td>1 890</td>
<td>1 200</td>
<td>1 040</td>
<td>1 350</td>
<td>2 000</td>
<td>450</td>
<td>1 000</td>
<td>data</td>
</tr>
<tr>
<td>MPDi</td>
<td>Market Price Differential</td>
<td>$/T</td>
<td>170</td>
<td>60</td>
<td>0</td>
<td>650</td>
<td>500</td>
<td>50</td>
<td>0</td>
<td>data or (RPi + PPi)</td>
</tr>
<tr>
<td>TPCi</td>
<td>Transfers to producers from consumers</td>
<td>$ million</td>
<td>34</td>
<td>6</td>
<td>0</td>
<td>130</td>
<td>38</td>
<td>18</td>
<td>0</td>
<td>data or (QC &gt; QP ? MPD * QC : 0)</td>
</tr>
<tr>
<td>TPTi</td>
<td>Transfers to producers from taxpayers</td>
<td>$ million</td>
<td>9</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>13</td>
<td>0</td>
<td>0</td>
<td>data or (QC &gt; QP ? MPD * QC : 0)</td>
</tr>
<tr>
<td>LVi</td>
<td>Price levies</td>
<td>$ million</td>
<td>20</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>10</td>
<td>0</td>
<td>0</td>
<td>data</td>
</tr>
<tr>
<td>EFCi</td>
<td>Excess Feed Cost</td>
<td>$ million</td>
<td>-</td>
<td>-</td>
<td>13</td>
<td>9</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>data or (QC &gt; QP ? MPD * QC : 0)</td>
</tr>
<tr>
<td>MPSi</td>
<td>Market Price Support</td>
<td>$ million</td>
<td>23</td>
<td>6</td>
<td>0</td>
<td>117</td>
<td>31</td>
<td>18</td>
<td>0</td>
<td>data or (TPCi + TPTi - LVi - EFCi)</td>
</tr>
</tbody>
</table>

---

### Table 6.3. Calculation of EFC for livestock commodities (example)

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Description</th>
<th>Units</th>
<th>Wheat</th>
<th>Barley</th>
<th>Oats</th>
<th>Milk</th>
<th>Beef</th>
<th>Source/equation</th>
</tr>
</thead>
<tbody>
<tr>
<td>MPDi</td>
<td>Market Price Differential</td>
<td>$/T</td>
<td>170</td>
<td>60</td>
<td>0</td>
<td></td>
<td></td>
<td>data or (QPi + QMi - QXi)</td>
</tr>
<tr>
<td>EFCi</td>
<td>Excess Feed Cost</td>
<td>$ million</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>13</td>
<td>9</td>
<td>data or (QPi + QMi - QXi)</td>
</tr>
<tr>
<td>QCi</td>
<td>Quantity of wheat used for feed by livestock i</td>
<td>000t</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>50</td>
<td>40</td>
<td>data or (QPi + QMi - QXi)</td>
</tr>
<tr>
<td>QMi</td>
<td>Excess Feed Cost of wheat for livestock commodity i</td>
<td>$ million</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>9</td>
<td>7</td>
<td>data or (QPi + QMi - QXi)</td>
</tr>
<tr>
<td>QXi</td>
<td>Quantity of oats used for feed by livestock i</td>
<td>000t</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>0</td>
<td>30</td>
<td>10</td>
</tr>
<tr>
<td>QMi</td>
<td>Excess Feed Cost of oats for livestock commodity i</td>
<td>$ million</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>0</td>
<td>0</td>
<td>data or (QPi + QMi - QXi)</td>
</tr>
</tbody>
</table>

---

17. As opposed to being not calculated (“nc”) for the other 11 standard commodities.
Box 6.1. Description of a country spreadsheet

The Secretariat calculates the indicators of support for each country within individual Excel spreadsheets (with the EU25 treated as one country). The data contained within these spreadsheets are combined using a SAS programme to derive indicators at the total OECD level. While each individual country spreadsheet has a number of worksheets containing data on production, policy measures, reference prices, etc., there are four standardised worksheets found within each country file:

(1) A standard worksheet named “XX MPS” in which MPS is calculated for each commodity, where XX is a two letter commodity abbreviation, e.g. WT stands for wheat and MK for milk. This worksheet also contains the data and formulas for calculating the Consumer Single Commodity Transfer (consumer SCT) as well as the relative indicators, the producer NPC and consumer NPC, for the commodities concerned.

(2) A standard worksheet named “XX SCT” in which the Producer Single Commodity Transfer (producer SCT) and %STC indicators are calculated for each commodity, with a separate sheet for “other commodities” named “XE SCT”.

(3) A worksheet named “Total” in which most of the national (aggregate) indicators are calculated, such as the PSE, GSSE, CSE and TSE, as well as the relative indicators, the %PSE, producer NAC, %CSE and consumer NAC. This worksheet contains all policy transfers included in the estimation of support for a country, shown under the appropriate PSE, GSSE and CSE categories. Each transfer is also labelled with the six labels defined in sub-section 3.3.3.

(4) A worksheet named “SCT GCT” in which the individual commodity producer SCT values are combined to calculate national (aggregate) producer SCT and %SCT indicators. This worksheet is also used to identify the Group Commodity Transfers (GCT), and calculate All Commodity Transfers (ACT) and Other Transfers to Producers (OTC) based on the labels given to each policy measure in the “Total” worksheet.

The tables presented in Chapters 6, 7 and 8 are based on the structure of the country specific Excel spreadsheets described above, which are available in the indicator database (www.oecd.org/agr/support) along with the country specific documentation.

6.1.2. National (aggregate) MPS

221. Once MPS values have been calculated for individual commodities, a national (aggregate) MPS can be derived. This procedure is called “MPS extrapolation” and is based on the assumption that the ratio between the national (aggregate) MPS and the total value of production is equal to the ratio between MPS and the value of production for the commodities for which MPS has been calculated. This assumption is expressed as:

\[
\frac{MPS_C}{VP_C} = \frac{\sum_{i \in AMC} MPS_i}{\sum_{i \in AMC} VP_i}
\]  

[6.1]

where:  

- \( MPS_C \) – national (aggregate) MPS for country C
- \( VP_C \) – value of agricultural production in country C
- \( \sum_{i \in AMC} MPS_i \) – sum of MPS for all commodities for which MPS has been calculated (AMC)
- \( \sum_{i \in AMC} VP_i \) – sum of value of production for all commodities for which MPS has been calculated
Therefore the formula for estimating the national (aggregate) MPS for a country is:

\[
MPS_C = \frac{\sum_{i \in \text{AMC}} MPS_i}{\sum_{i \in \text{AMC}} VP_i} \times VP_C
\]

This procedure is shown in table 6.4. The values of MPS for each of the individual are added together, including those for which it is zero (giving $195 million). The result is divided by the value of production for these commodities, including those for which MPS is zero, and multiplied by the total value of production.

Table 6.4. Calculation of national (aggregate) MPS: example

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Description</th>
<th>$ million</th>
<th>Source/equation</th>
</tr>
</thead>
<tbody>
<tr>
<td>VP_C</td>
<td>Total value of production (at farm gate)</td>
<td>2 325</td>
<td>data</td>
</tr>
<tr>
<td>VP_MC</td>
<td>Value of production of MPS commodities</td>
<td>1 683</td>
<td>Sum of VP, of MPS commodities</td>
</tr>
<tr>
<td>MPSWT</td>
<td>Wheat MPS</td>
<td>23</td>
<td></td>
</tr>
<tr>
<td>MPSBA</td>
<td>Barley MPS</td>
<td>6</td>
<td></td>
</tr>
<tr>
<td>MPSOT</td>
<td>Oats MPS</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>MPSMK</td>
<td>Milk MPS</td>
<td>117</td>
<td></td>
</tr>
<tr>
<td>MPSBF</td>
<td>Beef and veal MPS</td>
<td>31</td>
<td></td>
</tr>
<tr>
<td>MPSAMC</td>
<td>Standard MPS commodities, sub-total</td>
<td>177</td>
<td>Sum of MPSi of standard MPS commodities</td>
</tr>
<tr>
<td>MPSCT</td>
<td>Cotton MPS</td>
<td>18</td>
<td></td>
</tr>
<tr>
<td>MPSPDO</td>
<td>Potato MPS</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>MPSAMC</td>
<td>MPS commodities, sub-total</td>
<td>195</td>
<td>Sum of MPSi of all MPS commodities</td>
</tr>
<tr>
<td>MPS_C</td>
<td>Market Price Support</td>
<td>269</td>
<td>MPSAMC / VPAMC * VP</td>
</tr>
</tbody>
</table>

6.1.3. MPS for “other commodities”

To standardise the presentation of support indicators for individual commodities, the OECD presents the estimated MPS values for each of the standard MPS commodities and the residual is shown as “MPS for other commodities” (MPSOC).\(^{18}\) This is done in order to make the MPSOC comparable between countries. It is found by subtracting the value of MPS for the standard commodities from the national (aggregate) MPS:

\[
MPS_{OC} = MPS_C - \sum_{i \in \text{SMC}} MPS_i
\]

where: \(MPS_{OC}\) – total value of MPS for commodities other than standard MPS commodities

\(MPS_C\) – national (aggregate) MPS for country C

\(\sum_{i \in \text{SMC}} MPS_i\) – sum of MPS for the standard MPS commodities (SMC)

To assist with the calculation of the producer SCT, an aggregate MPS value for non-MPS commodities (MPSXE) is also calculated. It is found by subtracting the value of MPS for all MPS commodities from the national (aggregate) MPS:

\[18.\] Those standard commodities for which MPS is not calculated are indicated by a “nc” symbol while those commodities for whom MPS is estimated to be zero are shown as “0”. 

84
\[ MPS_{XE} = MPS_C - \sum_{i=AMC} MPS_i \]  

where: \( MPS_{XE} \) – total value of MPS for non-MPS commodities  
\( MPS_C \) – national (aggregate) MPS for country \( C \)  
\( \sum_{i=AMC} MPS_i \) – sum of MPS for all MPS commodities

225. These two calculations are shown in Table 6.5.

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Description</th>
<th>$ million</th>
<th>Source/equation</th>
</tr>
</thead>
<tbody>
<tr>
<td>MPS_C</td>
<td>Market Price Support</td>
<td>269</td>
<td></td>
</tr>
<tr>
<td>MPS_{SMC}</td>
<td>Standard MPS commodities</td>
<td>177</td>
<td>MPS_C - MPS_{SMC}</td>
</tr>
<tr>
<td>MPS_{OC}</td>
<td>Other commodities</td>
<td>92</td>
<td></td>
</tr>
<tr>
<td>MPS_{AMC}</td>
<td>All MPS commodities</td>
<td>195</td>
<td></td>
</tr>
<tr>
<td>MPS_{XE}</td>
<td>Non-MPS commodities</td>
<td>74</td>
<td>MPS_C - MPS_{AMC}</td>
</tr>
</tbody>
</table>

6.2. Producer Support Estimate (PSE)

**Producer Support Estimate (PSE):** the annual monetary value of gross transfers from consumers and taxpayers to agricultural producers, measured at the farm gate level, arising from policies that support agriculture, regardless of their nature, objectives or impacts on farm production or income.

226. To calculate the PSE for a country, the value of transfers to producers from other agricultural policies are added to the country (aggregate) MPS obtained in section 6.1:

\[ PSE_C = MPS_C + \sum_{BOT_p} = \sum_{m=A}^{G} PSE(sub)Category^m \]  

where: \( PSE_C \) – PSE for country \( C \)  
\( MPS_C \) – national (aggregate) MPS for country \( C \)  
\( BOT_p \) – budgetary and other transfers to producers from policy \( p \)  
\( \sum_{m=A}^{G} PSE(sub)Category^m \) - sum of PSE (sub) categories \( m \) to which policies are classified from \( A \) to \( G \).

227. To ensure transparency and assist with the calculation of other indicators, the name of each policy measure and the resulting value of transfer are listed under the PSE categories and sub-categories to which they have been classified according to the process set out in section 3.3 (Table 6.6). For consistency purposes, a selection of the policy measures discussed in sub-section 3.3.4 as worked examples are used here to illustrate policy measures. A broad policy measure is listed more than once when transfers relate to different commodities or when groups of commodities can be identified, e.g. Agricultural Stabilization Act and Crop insurance payments.
Table 6.6. Calculation of PSE (example)

<table>
<thead>
<tr>
<th>Description</th>
<th>$ million</th>
<th>Source/equation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Producer Support Estimate (PSE)</td>
<td>685</td>
<td>MPS + (A.2 + B + C + D + E + F + G)</td>
</tr>
<tr>
<td><strong>A. Support based on commodity outputs</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>A1. Market Price Support</td>
<td>269</td>
<td></td>
</tr>
<tr>
<td>A2. Payments based on output</td>
<td>56</td>
<td></td>
</tr>
<tr>
<td>Agricultural Stabilization Act - Wheat</td>
<td>10 data</td>
<td></td>
</tr>
<tr>
<td>Agricultural Stabilization Act - Milk</td>
<td>20 data</td>
<td></td>
</tr>
<tr>
<td>Agricultural Stabilization Act - Other crops</td>
<td>10 data</td>
<td></td>
</tr>
<tr>
<td>Loan deficiency payments</td>
<td>6 data</td>
<td></td>
</tr>
<tr>
<td>Milk Price Supplement for Cheese Production</td>
<td>10 data</td>
<td></td>
</tr>
<tr>
<td><strong>B. Payments based on input use</strong></td>
<td>105</td>
<td>B.1 + B.2 + B.3</td>
</tr>
<tr>
<td>B1. Variable input use</td>
<td>25</td>
<td>Sum of payments in B.1</td>
</tr>
<tr>
<td>Fuel tax rebates</td>
<td>10 data</td>
<td></td>
</tr>
<tr>
<td>Irrigation maintenance payments</td>
<td>15 data</td>
<td></td>
</tr>
<tr>
<td>B2. Fixed capital formation</td>
<td>60</td>
<td>Sum of payments in B.2</td>
</tr>
<tr>
<td>Property tax exemptions</td>
<td>15 data</td>
<td></td>
</tr>
<tr>
<td>Interest rate concession</td>
<td>30 data</td>
<td></td>
</tr>
<tr>
<td>Capital grants for on-farm infrastructure</td>
<td>15 data</td>
<td></td>
</tr>
<tr>
<td>B3. On-farm services</td>
<td>20</td>
<td>Sum of payments in B.3</td>
</tr>
<tr>
<td>Extension and advisory services</td>
<td>10 data</td>
<td></td>
</tr>
<tr>
<td>Pest and disease control</td>
<td>5 data</td>
<td></td>
</tr>
<tr>
<td>FarmBis</td>
<td>5 data</td>
<td></td>
</tr>
<tr>
<td><strong>C. Payments based on current A/An/R/I, production required</strong></td>
<td>70</td>
<td>C.1 + C.2 + C.3</td>
</tr>
<tr>
<td>C1. single commodity</td>
<td>20</td>
<td>Sum of payments in C.1</td>
</tr>
<tr>
<td>Crop insurance payments - Wheat</td>
<td>10 data</td>
<td></td>
</tr>
<tr>
<td>Crop insurance payments - Barley</td>
<td>5 data</td>
<td></td>
</tr>
<tr>
<td>Crop insurance payments - Oats</td>
<td>5 data</td>
<td></td>
</tr>
<tr>
<td>C2. specific group of commodities</td>
<td>35</td>
<td>Sum of payments in C.2</td>
</tr>
<tr>
<td>Organic crop farming</td>
<td>30 data</td>
<td></td>
</tr>
<tr>
<td>Agri-environmental grass premium</td>
<td>5 data</td>
<td></td>
</tr>
<tr>
<td>C3. all commodities</td>
<td>15</td>
<td>Sum of payments in C.3</td>
</tr>
<tr>
<td>Income tax concessions</td>
<td>15 data</td>
<td></td>
</tr>
<tr>
<td><strong>D. Payments based on non-current A/An/R/I, production required</strong></td>
<td>50</td>
<td>Sum of payments in D</td>
</tr>
<tr>
<td>Structural payment to milk producers</td>
<td>50 data</td>
<td></td>
</tr>
<tr>
<td><strong>E. Payments based on non-current A/An/R/I, production not required</strong></td>
<td>110</td>
<td>E.1 + E.2</td>
</tr>
<tr>
<td>E1. Variable rates</td>
<td>60</td>
<td>Sum of payments in E.1</td>
</tr>
<tr>
<td>Counter Cyclical Payments</td>
<td>60 data</td>
<td></td>
</tr>
<tr>
<td>E2. Fixed rates</td>
<td>50</td>
<td>Sum of payments in E.2</td>
</tr>
<tr>
<td>Single Payment Scheme</td>
<td>50 data</td>
<td></td>
</tr>
<tr>
<td><strong>F. Payments based on non-commodity criteria</strong></td>
<td>25</td>
<td>F.1 + F.2 + F.3</td>
</tr>
<tr>
<td>F1. long-term resource retirement</td>
<td>15</td>
<td>Sum of payments in F.1</td>
</tr>
<tr>
<td>Afforestation</td>
<td>5 data</td>
<td></td>
</tr>
<tr>
<td>Conservation Reserve Program</td>
<td>10 data</td>
<td></td>
</tr>
<tr>
<td>F2. a specific non-commodity output</td>
<td>10</td>
<td>Sum of payments in F.2</td>
</tr>
<tr>
<td>Payments for Hedges and Rustic Groves</td>
<td>5 data</td>
<td></td>
</tr>
<tr>
<td>Payments for Floral Fallow</td>
<td>5 data</td>
<td></td>
</tr>
<tr>
<td>F3. other non-commodity criteria</td>
<td>0</td>
<td>Sum of payments in F.3</td>
</tr>
<tr>
<td><strong>G. Miscellaneous payments</strong></td>
<td>0</td>
<td>Sum of payments in G</td>
</tr>
</tbody>
</table>
6.3. Percentage PSE (%PSE) and Producer Nominal Assistance Coefficient (producer NAC)

**Percentage PSE (%PSE):** PSE as a share of gross farm receipts.

**Producer Nominal Assistance Coefficient (producer NAC):** The ratio between the value of gross farm receipts (including support) and gross farm receipts valued at border prices (measured at farm gate).

228. The %PSE is calculated by dividing the PSE by the value of gross farm receipts (GFR), and multiplying the result by 100:

\[
%PSE_c = \frac{PSE_c}{GFR_c} \times 100 = \frac{PSE_c}{VP_c + BOT_c} \times 100
\]  

[6.6]

229. GFR represents the value of production (VP), including budgetary and other transfers (BOT). Working through this formula in the example results in a %PSE of 25% (Table 6.7)

**Table 6.7. Calculation of %PSE and Producer NAC (example)**

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Description</th>
<th>Units</th>
<th>Source/equation</th>
</tr>
</thead>
<tbody>
<tr>
<td>VP</td>
<td>Total value of production (at farm gate)</td>
<td>$ million</td>
<td>2 325</td>
</tr>
<tr>
<td>PSE</td>
<td>Producer Support Estimate</td>
<td>$ million</td>
<td>685</td>
</tr>
<tr>
<td>MPS</td>
<td>Market Price Support</td>
<td>$ million</td>
<td>269</td>
</tr>
<tr>
<td>BOT</td>
<td>Budgetary and Other Transfers to Producers</td>
<td>$ million</td>
<td>416</td>
</tr>
<tr>
<td>GFR</td>
<td>Gross Farm Receipts</td>
<td>$ million</td>
<td>2 741</td>
</tr>
<tr>
<td>%PSE</td>
<td>Percentage Producer Support Estimate</td>
<td>%</td>
<td>25</td>
</tr>
<tr>
<td>producer NAC</td>
<td>Producer Nominal Assistance Coefficient</td>
<td>ratio</td>
<td>1.33</td>
</tr>
</tbody>
</table>

230. The producer NAC is calculated by dividing the value of gross farm receipts by the value of production at border prices. Expressed algebraically:

\[
producer NAC_c = \frac{GFR_c}{VP_c - MPS_c}
\]  

[6.7]

231. The value of production at border prices is obtained by subtracting the value of MPS from the total value of production, e.g. $2 044 million in the example. The producer NAC is mathematically related to the %PSE, and can be alternatively derived as:

\[
producer NAC_c = 1 + \frac{%PSE_c}{(100 - %PSE_c)}
\]  

[6.8]

232. Working through this formula in the example results in a producer NAC of 1.33.
6.4. Indicators of producer support based on the degree of commodity specificity

233. The PSE can be broken down into four separate indicators of support based on the degree to which policy measures deliver support on a commodity basis: separated out into support provided to a single commodity, a group of commodities, all commodities, or whether producers are not required to produce commodities to receive support (Table 6.8).

Table 6.8. Indicators of producer support based on the degree of commodity specificity

<table>
<thead>
<tr>
<th>Indicator</th>
<th>Relationship with PSE categories</th>
</tr>
</thead>
<tbody>
<tr>
<td>I. Producer Single Commodity Transfers (producer SCT)</td>
<td>Sum of all single commodity transfers in PSE categories A, B, C and D</td>
</tr>
<tr>
<td>— Commodity i (1 to n) (producer SCT_i)</td>
<td>- Includes only specific policy measures for commodity i</td>
</tr>
<tr>
<td>II. Group Commodity Transfers (GCT)</td>
<td>Sum of transfers to groups of commodities in PSE categories B, C, and D</td>
</tr>
<tr>
<td>— Group k (1 to m) (GCT_k)</td>
<td>- Includes only specific policy measures for group k</td>
</tr>
<tr>
<td>III. All Commodity Transfers (ACT)</td>
<td>Sum of transfers to all commodities in PSE categories B, C, and D</td>
</tr>
<tr>
<td>IV. Other Transfers to Producers (OTP)</td>
<td>Sum of transfers in PSE categories E, F and G</td>
</tr>
<tr>
<td>Total PSE (I+II+III+IV)</td>
<td>Sum of transfers to single, group and all commodities and other transfers (producer SCT+GCT+ACT+OTP)</td>
</tr>
</tbody>
</table>

The database contains complete information on the list of commodities to which each policy measure applies.

234. These four categories are mutually exclusive in the sense that payments included in one category are not included in others, e.g. transfers to wheat in the producer SCT are not included in transfers to cereals as a group in the GCT category. In this way, there are no overlaps between the categories and they therefore add up to the total PSE.

235. The first step in calculating these indicators is to attribute each policy measure to one of these four categories, and then within the producer SCT and GCT categories to specific commodities or groups of commodities respectively. This is part of the process of labelling policy measures based on various implementation criteria as detailed in section 3.3.3. The following four sub-sections explain further details about these indicators.

236. Table 6.9 shows how this attribution is made for policy measures in the example. The two digit symbol in the column titled “Single commodity” indicates the commodity to which support is provided. These are policies whereby receipt of the transfer requires the production of that designated commodity. MPS is by definition included in the producer SCT, as it captures the transfers associated with policies affecting the price of a particular commodity. The label “AC” is given to policy measures which place no restrictions on the commodity produced but require the recipient to produce some commodity of their choice. Policy measures in the last three PSE categories are labelled “OTP” because by definition these provide transfers that either do not require commodity production or their commodity specificity is unknown.
### Table 6.9. Attribution of PSE policies to commodities (example)

<table>
<thead>
<tr>
<th>Description</th>
<th>$ million</th>
<th>Single commodity</th>
<th>Attribution to commodities</th>
<th>All Commodities</th>
<th>Non commodity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Producer Support Estimate (PSE)</td>
<td>685</td>
<td>395</td>
<td>35</td>
<td>120</td>
<td>135</td>
</tr>
<tr>
<td>A. Support based on commodity outputs</td>
<td>325</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>A1. Market Price Support</td>
<td>269</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. MPS commodities</td>
<td>195</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Wheat MPS</td>
<td>23</td>
<td>WT</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Barley MPS</td>
<td>6</td>
<td>BA</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Oats MPS</td>
<td>0</td>
<td>OT</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Milk MPS</td>
<td>117</td>
<td>MK</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Beef and veal MPS</td>
<td>31</td>
<td>BF</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cotton MPS</td>
<td>18</td>
<td>CT</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Potato MPS</td>
<td>0</td>
<td>PO</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>A2. Payments based on output</td>
<td>56</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Agricultural Stabilization Act - Wheat</td>
<td>10</td>
<td>WT</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Agricultural Stabilization Act - Milk</td>
<td>20</td>
<td>MK</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Agricultural Stabilization Act - Other crops</td>
<td>10</td>
<td>XE</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Loan deficiency payment - Wheat</td>
<td>6</td>
<td>WT</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Milk Price Supplement for Cheese Production</td>
<td>10</td>
<td>MK</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>B. Payments based on input use</td>
<td>105</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>B1. Variable input use</td>
<td>25</td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Fuel tax rebates</td>
<td>10</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Irrigation maintenance payments</td>
<td>15</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>B2. Fixed capital formation</td>
<td>60</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Property tax exemptions</td>
<td>15</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Interest rate concession</td>
<td>30</td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Capital grants for on-farm infrastructure</td>
<td>15</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>B3. On-farm services</td>
<td>20</td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Extension and advisory services</td>
<td>10</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pest and disease control</td>
<td>5</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>FarmBis</td>
<td>5</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>C. Payments based on current A/An/R/I, production required</td>
<td>70</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>C1. single commodity</td>
<td>20</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Crop Insurance Payments - Wheat</td>
<td>10</td>
<td>WT</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Crop Insurance Payments - Barley</td>
<td>5</td>
<td>BA</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Crop Insurance Payments - Oats</td>
<td>5</td>
<td>OT</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>C2. specific group of commodities</td>
<td>35</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Organic crop farming</td>
<td>30</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Agri-environmental grass premium</td>
<td>5</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>C3. all Commodities</td>
<td>15</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Income tax concessions</td>
<td>15</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>D. Payments based on non-current A/An/R/I, production required</td>
<td>50</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>D1. Structural payment to milk producers</td>
<td>50</td>
<td>MK</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>E. Payments based on non-current A/An/R/I, production not required</td>
<td>110</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>E1. Variable rates</td>
<td>60</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Counter Cyclical Payments</td>
<td>60</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>E2. Fixed rates</td>
<td>50</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Single Payment Scheme</td>
<td>50</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>F. Payments based on non-commodity criteria</td>
<td>25</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>F1. long-term resource retirement</td>
<td>15</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Afforestation</td>
<td>5</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Conservation Reserve Program</td>
<td>10</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>F2. a specific non-commodity output</td>
<td>10</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Payments for Hedges and Rustic Groves</td>
<td>5</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Payments for Floral Fallow</td>
<td>5</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>F3. other non-commodity criteria</td>
<td>0</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>G. Miscellaneous payments</td>
<td>0</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
6.4.1. **Producer Single Commodity Transfers (producer SCT)**

**Producer Single Commodity Transfers (producer SCT):** the annual monetary value of gross transfers from consumers and taxpayers to agricultural producers, measured at the farm gate level, arising from policies linked to the production of a single commodity such that the producer must produce the designated commodity in order to receive the transfer.

237. A national (aggregate) producer SCT can be found by summing up the value of transfers arising from policies that have been attributed to a single commodity (SC):

\[ \text{producerSCT}_C = MPS_C + \sum_{l=SC} BO\text{T}^i_p \]  

[6.9]

where: \( \sum_{l=SC} BO\text{T}^i_p \) – sum of budgetary and other transfers to producers from policy \( p \) that have been labelled as based on a single commodity (SC).

238. This is in general the sum of categories A and C1 plus the value of transfers from policies labelled as going to single commodities in categories B and D. Based on Table 6.9, the value of producer SCT is USD 395 million. This total includes transfers to commodities other than MPS commodities.

239. On a similar basis, a producer SCT can be calculated for individual commodities (Table 6.10):

\[ \text{producerSCT}_i = MPS_i + \sum_{l=i} BO\text{T}^i_p \]  

[6.10]

where: \( \sum_{l=i} BO\text{T}^i_p \) – budgetary and other transfers to producers from policy \( p \) that have been labelled as based on commodity \( i \)

240. As for MPS, a producer SCT for other commodities (representing commodities other than standard MPS commodities) can be found by subtracting the sum of producer STC for the standard MPS commodities from the national (aggregate) value:

\[ \text{producerSCT}_{OC} = \text{producerSCT}_C - \sum_{i\in SMC} \text{producerSCT}_i \]  

[6.11]

where: \( \sum_{i\in SMC} \text{producerSCT}_i \) – sum of transfers to producers for the standard MPS commodities

<table>
<thead>
<tr>
<th>Description</th>
<th>Wheat</th>
<th>Barley</th>
<th>Oats</th>
<th>Milk</th>
<th>Beef</th>
<th>Cotton</th>
<th>Potato</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>A1. Market Price Support</td>
<td>23</td>
<td>6</td>
<td>0</td>
<td>117</td>
<td>31</td>
<td>18</td>
<td>0</td>
<td>177</td>
</tr>
<tr>
<td>A2. Payments based on output</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>30</td>
<td>0</td>
<td>6</td>
<td>0</td>
<td>40</td>
</tr>
<tr>
<td>Agricultural Stabilization Act</td>
<td>0</td>
<td>0</td>
<td>20</td>
<td>0</td>
<td>0</td>
<td>30</td>
<td>10</td>
<td>40</td>
</tr>
<tr>
<td>Loan deficiency payments</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>6</td>
<td>-</td>
<td>0</td>
<td>6</td>
<td>6</td>
</tr>
<tr>
<td>Milk Price Supplement for Cheese Production</td>
<td>-</td>
<td>-</td>
<td>10</td>
<td>-</td>
<td>-</td>
<td>0</td>
<td>10</td>
<td>10</td>
</tr>
<tr>
<td>B. Payments based on input use</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>C1. Payments based on current A/An/R/I, production required, single commodity</td>
<td>10</td>
<td>5</td>
<td>5</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>20</td>
</tr>
<tr>
<td>Crop Insurance Payments</td>
<td>10</td>
<td>5</td>
<td>5</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>20</td>
</tr>
<tr>
<td>D. Payments based on non-current A/An/R/I, production required</td>
<td>0</td>
<td>0</td>
<td>50</td>
<td>0</td>
<td>0</td>
<td>50</td>
<td>0</td>
<td>50</td>
</tr>
<tr>
<td>Structural payment to milk producers</td>
<td>-</td>
<td>-</td>
<td>50</td>
<td>-</td>
<td>-</td>
<td>50</td>
<td>0</td>
<td>50</td>
</tr>
</tbody>
</table>

Table 6.10. Calculation of producer SCT (example)
6.4.2. **Group Commodity Transfers (GCT)**

**Group Commodity Transfers (GCT):** the annual monetary value of gross transfers from consumers and taxpayers to agricultural producers, measured at the farm gate level, arising from policies whose payments are made on the basis that one or more of a designated list of commodities is produced, i.e. a producer may produce from a set of allowable commodities and receive a transfer that does not vary with respect to this decision.

241. The value of Group Commodity Transfers for a country is calculated by adding together the value of transfers that have been attributed to groups of commodities (GC):

\[
GCT_C = \sum_{l=GC}^{GCl} BOT^{l}_{p} \tag{6.12}
\]

where: \(\sum_{l=GC}^{GCl} BOT^{l}_{p}\) – budgetary and other transfers to producers from policy \(p\) that have been labelled as based on a group of commodities.

242. Based on Table 6.9, this comes to $35 million. On a similar basis, a GCT can be calculated for groups of commodities where:

\[
GCT_{k} = \sum_{l=k}^{kl} BOT^{l}_{p} \tag{6.13}
\]

where: \(\sum_{l=k}^{kl} BOT^{l}_{p}\) – budgetary and other transfers to producers from policy \(p\) that have been labelled as based on a commodity group \(k\).

243. There are nine standard commodity groups (Table 6.11). If the policy measure is targeting a group of commodities not covered by any of these nine groups, an additional group may be created to reflect actual support policies. Detailed country lists of commodity groups included in the GCT are provided in Annex 6.1. Transfers allocated to the different groups within the GCT are mutually exclusive, e.g. transfers to the **grains** group are not included in transfers to a **grains and oilseeds** group.

**Table 6.11. Calculation of GCT (example)**

<table>
<thead>
<tr>
<th>Group Commodity Transfers (GCT)</th>
<th>$ million</th>
<th>Share of GCT %</th>
</tr>
</thead>
<tbody>
<tr>
<td>National (aggregate)</td>
<td>35</td>
<td>86</td>
</tr>
<tr>
<td>All crops</td>
<td>30</td>
<td>0</td>
</tr>
<tr>
<td>All arable crops</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Grains</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Oilseeds</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Other crops</td>
<td>5</td>
<td>14</td>
</tr>
<tr>
<td>All fruits and vegetables</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>All livestock</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Ruminants</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Non-ruminants</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

244. Table 6.11 illustrates the allocation of transfers to the different groups based on the attribution done in Table 6.9. In this case all the policy measures are targeted to the standard groups, so no additional groups are required.
6.4.3. All Commodity Transfers (ACT)

All Commodity Transfers (ACT): the annual monetary value of gross transfers from consumers and taxpayers to agricultural producers, measured at the farm gate level, arising from policies that place no restrictions on the commodity produced but require the recipient to produce some commodity of their choice.

245. The value of All Commodity Transfers for a country is calculated by adding together the value of transfers that have been attributed to all (AC):

\[ ACT_c = \sum_{l=AC}^{m} BOT_l^p \]

where: \( \sum_{l=AC}^{m} BOT_l^p \) – sum of budgetary and other transfers to producers from policy \( p \) that have been labelled as based on all commodities (AC)

246. Table 6.9 shows that there were seven policies attributed to ACT, including fuel tax, interest rate and income tax concessions, as well as extension and pest and disease control services provided to all farmers. Summing up the value of transfers from these seven policies gives an ACT estimate of $120.

6.4.4. Other Transfers to Producers (OTP)

Other Transfers to Producers (OTP): the annual monetary value of gross transfers from consumers and taxpayers to agricultural producers, measured at the farm gate level, arising from policies that do not require any commodity production at all.

247. Other transfers to producers are calculated by summing together the value of transfers received by producers from policies that are classified into the PSE categories E, F and G.

\[ OTP_c = \sum_{m=E,F,G}^{PSE\ categories} PSE\ categories^m \]

where: \( \sum_{m=E,F,G}^{PSE\ categories} PSE\ categories^m \) – the sum of transfers to producers that have been classified in PSE categories E, F and G

248. In the example, there are six such policies, providing USD 135 million in support to producers.
6.5. Producer Nominal Protection Coefficient (producer NPC)

**Producer Nominal Protection Coefficient (producer NPC):** the ratio between the average price received by producers at the farm gate (including payments per tonne of current output), and the border price, measured at the farm gate.

249. Like MPS, the producer NPC indicator is first calculated at the individual commodity level. The results are then used to derive a national (aggregate) producer NPC.

### 6.5.1. Producer NPC for individual commodities

250. The producer NPC for an individual commodity can be derived in two ways. First by comparing domestic and border prices, where the domestic price is the producer price plus the per unit transfers received from payments based on output:

\[
producerNPC_i = \left( \frac{PP_i + \frac{PO_i}{QP_i}}{RP_i} \right) [6.16]
\]

where:
- \(PP_i\) – producer price of commodity \(i\)
- \(PO_i\) – sum of transfers to commodity \(i\) in PSE category A.2
- \(QP_i\) – quantity produced of commodity \(i\)
- \(RP_i\) – reference price of commodity \(i\)

251. Table 6.12 illustrates the calculation of producer NPC for individual commodities. Producer NPC values for individual commodities vary from 1.59 in the case of milk to 1.00 in the case of oats and potatoes.

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Description</th>
<th>Units</th>
<th>Wheat</th>
<th>Barley</th>
<th>Oats</th>
<th>Milk</th>
<th>Beef</th>
<th>Cotton</th>
<th>Potato</th>
<th>Source/equation</th>
</tr>
</thead>
<tbody>
<tr>
<td>QP_i</td>
<td>Level of production</td>
<td>000t</td>
<td>250</td>
<td>100</td>
<td>50</td>
<td>200</td>
<td>100</td>
<td>360</td>
<td>160</td>
<td></td>
</tr>
<tr>
<td>PP_i</td>
<td>Producer price (at farm gate)</td>
<td>$/T</td>
<td>2,060</td>
<td>1,260</td>
<td>1,040</td>
<td>1,350</td>
<td>2,000</td>
<td>2,500</td>
<td>500</td>
<td>1,000</td>
</tr>
<tr>
<td>VP_i</td>
<td>Value of production (at farm gate)</td>
<td>$ million</td>
<td>515</td>
<td>126</td>
<td>52</td>
<td>400</td>
<td>250</td>
<td>180</td>
<td>160</td>
<td></td>
</tr>
<tr>
<td>RP_i</td>
<td>Reference Price (at farm gate)</td>
<td>$/T</td>
<td>1,890</td>
<td>1,200</td>
<td>1,040</td>
<td>1,350</td>
<td>2,000</td>
<td>450</td>
<td>1,000</td>
<td></td>
</tr>
<tr>
<td>PO_i</td>
<td>A2. Payments based on output</td>
<td>$ million</td>
<td>10</td>
<td>0</td>
<td>0</td>
<td>30</td>
<td>0</td>
<td>6</td>
<td>0</td>
<td>(PO_i / QP_i)</td>
</tr>
<tr>
<td>POT_i</td>
<td>Payments per tonne</td>
<td>$/T</td>
<td>40</td>
<td>0</td>
<td>0</td>
<td>150</td>
<td>0</td>
<td>0</td>
<td>17</td>
<td>(POT_i / QP_i)</td>
</tr>
<tr>
<td>TPC_i</td>
<td>Transfers to producers from consumers</td>
<td>$ million</td>
<td>34</td>
<td>6</td>
<td>0</td>
<td>130</td>
<td>38</td>
<td>18</td>
<td>0</td>
<td>(TPC_i / QP_i)</td>
</tr>
<tr>
<td>TPT_i</td>
<td>Transfers to producers from taxpayers</td>
<td>$ million</td>
<td>9</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>13</td>
<td>0</td>
<td>0</td>
<td>(TPT_i / QP_i)</td>
</tr>
<tr>
<td>Producer NPC_i</td>
<td>Producer Nominal Protection Coefficient</td>
<td>ratio</td>
<td>1.11</td>
<td>1.05</td>
<td>1.00</td>
<td>1.59</td>
<td>1.25</td>
<td>1.15</td>
<td>1.00</td>
<td>((PP_i + POT_i) / RP_i\text{ or} \frac{VP_i + PO_i}{VP_i - TPC_i - TPT_i})</td>
</tr>
</tbody>
</table>

### 6.5.2. Producer NPC for a country

252. Once producer NPC values have been calculated for each individual commodity, a national (aggregate) NPC can be derived. As prices and quantities cannot be aggregated for different commodities, the producer NPC for a country is calculated using the value of transfers:
where: $V_P$ – total value of production for country $C$

$P_O$ – total sum of transfers in PSE category A.2 for country $C$

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

$T_P T$ – total Transfers to Producers from Taxpayers for country $C$

253. The producer 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. This is also shown in Table 6.11. When expressed in this form it can be seen that the denominator for the producer NPC, while very close to, is different from the denominator used to calculate the producer NAC (equation 6.11). The denominator for the producer NAC subtracts the total MPS value from the value of production and not just transfers from consumers and taxpayers to producer, i.e. the denominator for the producer NAC is potentially a larger number as it adds back in levies and excess feed cost as appropriate

254. While the $V_P$ and $P_O$ values are known at the national level, values for $T_P C$ and $T_P T$ have to be calculated. Following the assumption and procedure for deriving a national (aggregate) MPS, these values are derived by extrapolating from $T_P C$ and $T_P T$ for the individual commodities according to:

$$
T_P C = \frac{\sum_{i \in AMC} T_P C_i}{\sum_{i \in AMC} V_P_i} \times V_P \\
T_P T = \frac{\sum_{i \in AMC} T_P T_i}{\sum_{i \in AMC} V_P_i} \times V_P
$$

where:

\[\sum_{i \in AMC} T_P C_i\] – sum of $T_P C$ for all commodities for which MPS has been calculated

\[\sum_{i \in AMC} T_P T_i\] – sum of $T_P T$ for all commodities for which MPS has been calculated

\[\sum_{i \in AMC} V_P_i\] – sum of $V_P$ for all commodities for which MPS has been calculated

255. Table 6.13 shows the calculation of a national (aggregate) producer NPC, which at 1.20 is exactly the same as the aggregate producer NPC for the commodities for which MPS has been calculated.

Table 6.13. Calculation of a national (aggregate) producer NPC (example)

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Description</th>
<th>Units</th>
<th>All MPS commodities</th>
<th>Total</th>
<th>Source/equation</th>
</tr>
</thead>
<tbody>
<tr>
<td>$V_P$</td>
<td>Value of production (at farm gate)</td>
<td>$\text{million}$</td>
<td>1 683</td>
<td>2 325</td>
<td>data</td>
</tr>
<tr>
<td>$P_O$</td>
<td>A2. Payments based on output</td>
<td>$\text{million}$</td>
<td>46</td>
<td>56</td>
<td>data</td>
</tr>
<tr>
<td>$T_P C$</td>
<td>Transfers to producers from consumers</td>
<td>$\text{million}$</td>
<td>226</td>
<td>312</td>
<td>$T_P C_{AMC} * V_P / V_P_{AMC}$</td>
</tr>
<tr>
<td>$T_P T$</td>
<td>Transfers to producers from taxpayers</td>
<td>$\text{million}$</td>
<td>21</td>
<td>29</td>
<td>$T_P T_{AMC} * V_P / V_P_{AMC}$</td>
</tr>
<tr>
<td>Producer NPC</td>
<td>Producer Nominal Protection Coefficient</td>
<td>ratio</td>
<td>1.20</td>
<td>1.20</td>
<td>$(V_P + P_O)/(V_P - T_P C - T_P T)$</td>
</tr>
</tbody>
</table>
6.5.3. Producer NPC for other commodities

256. As for MPS, a producer NPC for “other commodities”, i.e. non standard MPS commodities, is also calculated. Again this is estimated based on the value method in equation 6.21 rather than the price method in equation 6.20. 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:

\[
\text{producerNPC}_{oc} = \left( VP_C - \sum_{i \in \text{SMC}} VP_i \right) + \left( PO_C - PO_{oc} \right) \]

257. Table 6.14 illustrates how this calculation is performed. Note that in this instance the producer NPC for other commodities is lower than the national (aggregate) producer NPC because the producer NPC derived for the standard commodities is higher than that for national average.

Table 6.14. Calculation of a producer NPC for Other Commodities (example)

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Description</th>
<th>Units</th>
<th>Total Standard MPS</th>
<th>Other commodities</th>
<th>Source/equation</th>
</tr>
</thead>
<tbody>
<tr>
<td>VP_i</td>
<td>Value of production (at farm gate)</td>
<td>$ million</td>
<td>2 325</td>
<td>1 343</td>
<td>VP_i - VP_{smc}</td>
</tr>
<tr>
<td>PO_i</td>
<td>A2. Payments based on output</td>
<td>$ million</td>
<td>56</td>
<td>40</td>
<td>PO_i - PO_{smc}</td>
</tr>
<tr>
<td>TPC_i</td>
<td>Transfers to producers from consumers</td>
<td>$ million</td>
<td>312</td>
<td>208</td>
<td>TPC_i - TPC_{smc}</td>
</tr>
<tr>
<td>TPT_i</td>
<td>Transfers to producers from taxpayers</td>
<td>$ million</td>
<td>29</td>
<td>21</td>
<td>TPT_i - TPT_{smc}</td>
</tr>
<tr>
<td>PNP</td>
<td>Producer Nominal Protection Coefficient</td>
<td>ratio</td>
<td>1.20</td>
<td>1.24</td>
<td>(VP_i + PO_i)/(VP_i - TPC_i)</td>
</tr>
</tbody>
</table>

6.6. Percentage Producer Single Commodity Transfers (%SCT)

258. The general method for calculating the %SCT follows that for the %PSE, although fewer categories of support are involved in the calculation.

6.6.1. %SCT for individual commodities

259. The %SCT for an individual commodity is found by dividing the value of producer SCT for that commodity by gross receipts (GFR) for that commodity and multiplying the result by 100:

\[
\%SCT_i = \frac{\text{producerSCT}_i}{\text{GFR}_i} \times 100 = \frac{\text{producerSCT}_i}{\text{producerSCT}_i + VP_i - MPS_i} \times 100
\]

260. GFR is calculated as the sum of policy transfers to that commodity and market receipts. Like for the %PSE, MPS is subtracted to avoid double-counting as price transfers to producers are included in both the producer SCT and VP values.

261. Table 6.15 demonstrates this procedure. Value figures for the various transfers were obtained in Table 6.9. %SCT values range from 0% for potatoes through to 41% for milk. Note that oats, which had a PNPC of 1 because it does not receive transfers through market price support or payments based on output, receives support through category C1 (PCS) and therefore has a %SCT of 9%.
Table 6.15. Calculation of %SCT for individual commodities (example)

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Description</th>
<th>Units</th>
<th>Wheat</th>
<th>Barley</th>
<th>Date</th>
<th>Milk</th>
<th>Beef</th>
<th>Cotton</th>
<th>Potato</th>
<th>Source/equation</th>
</tr>
</thead>
<tbody>
<tr>
<td>VPi</td>
<td>Value of production</td>
<td>$ million</td>
<td>515</td>
<td>126</td>
<td>52</td>
<td>400</td>
<td>250</td>
<td>180</td>
<td>160</td>
<td></td>
</tr>
<tr>
<td>PSCTc</td>
<td>Producer Single Commodity Transfers</td>
<td>$ million</td>
<td>43</td>
<td>11</td>
<td>5</td>
<td>197</td>
<td>31</td>
<td>24</td>
<td>0</td>
<td>MPS, + PO, + PI + PCS + PHR,</td>
</tr>
<tr>
<td>MPSc</td>
<td>A1. Market Price Support</td>
<td>$ million</td>
<td>23</td>
<td>6</td>
<td>0</td>
<td>117</td>
<td>31</td>
<td>18</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>POc</td>
<td>A2. Payments based on output</td>
<td>$ million</td>
<td>10</td>
<td>0</td>
<td>30</td>
<td>0</td>
<td>6</td>
<td>0</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>Pic</td>
<td>B. Payments based on input use</td>
<td>$ million</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>PCSi</td>
<td>C1. Payments based on current A/An/R/I, product</td>
<td>$ million</td>
<td>10</td>
<td>5</td>
<td>5</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>PHRc</td>
<td>D. Payments based on non-current A/An/R/I, product</td>
<td>$ million</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>50</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td></td>
</tr>
</tbody>
</table>

6.6.2. %SCT for a country

262. A national (aggregate) %SCT is obtained using the same formulas as for individual commodities except that the values represent the national (aggregate) values:

\[
\%SCT_C = \frac{\text{producerSCT}_C}{\text{GR}_C} \times 100 = \frac{\text{producerSCT}_C}{\text{producerSCT}_C + \text{VP}_C - \text{MPS}_C} \times 100 \quad [6.21]
\]

263. These value figures have already been calculated in Tables 6.1, 6.4 and 6.8. Table 6.16 presents the results for this calculation.

Table 6.16. Calculation of a national (aggregate) %SCT and a %SCT for Other Commodities (example)

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Description</th>
<th>Units</th>
<th>Total</th>
<th>Standard MPS commodities</th>
<th>Other commodities</th>
<th>Source/equation</th>
</tr>
</thead>
<tbody>
<tr>
<td>VPc</td>
<td>Value of production</td>
<td>$ million</td>
<td>2 325</td>
<td>1 343</td>
<td>982</td>
<td></td>
</tr>
<tr>
<td>PSCTc</td>
<td>Producer Single Commodity Transfers</td>
<td>$ million</td>
<td>395</td>
<td>287</td>
<td>108</td>
<td>PSCTc + PSCT_smc</td>
</tr>
<tr>
<td>MPSc</td>
<td>A1. Market Price Support</td>
<td>$ million</td>
<td>269</td>
<td>177</td>
<td>92</td>
<td>MPSc - MPS_smc</td>
</tr>
<tr>
<td>POc</td>
<td>A2. Payments based on output</td>
<td>$ million</td>
<td>56</td>
<td>40</td>
<td>16</td>
<td>POc - PO_smc</td>
</tr>
<tr>
<td>Pic</td>
<td>B. Payments based on input use</td>
<td>$ million</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>PIc - PI_smc</td>
</tr>
<tr>
<td>PCSc</td>
<td>C1. Payments based on current A/An/R/I, product</td>
<td>$ million</td>
<td>20</td>
<td>20</td>
<td>0</td>
<td>PCSc - PCS_smc</td>
</tr>
<tr>
<td>PHRc</td>
<td>D. Payments based on non-current A/An/R/I, product</td>
<td>$ million</td>
<td>50</td>
<td>50</td>
<td>0</td>
<td>PHRc - PHR_smc</td>
</tr>
<tr>
<td>Grc</td>
<td>Gross Receipts</td>
<td>$ million</td>
<td>2 451</td>
<td>1 453</td>
<td>998</td>
<td>GFRc - GFR_smc</td>
</tr>
<tr>
<td>%PSCTc</td>
<td>Percentage Producer Single Commodity Transfer</td>
<td>%</td>
<td>16</td>
<td>20</td>
<td>11</td>
<td></td>
</tr>
</tbody>
</table>

6.6.3. %SCT for other commodities

264. Like the producer NPC, the %SCT for other commodities can be found by using the producer SCT and GFR values for the standard MPS commodities and for the country as a whole:

\[
\%SCT_{oc} = \frac{(\text{producerSCT}_C - \sum_{i \in \text{SMC}} \text{producerSCT}_i)}{(\text{GFR}_C - \sum_{i \in \text{SMC}} \text{GFR}_i)} \times 100 \quad [6.22]
\]

265. Table 6.16 also shows the calculation of the %PSCT for other commodities.
Table A6.1. Commodities for which MPS is calculated in OECD and non-OECD countries

<table>
<thead>
<tr>
<th>ALL COMMODITIES</th>
<th>MPS COMMODITIES (AMC)</th>
<th>ADDITIONAL MPS COMMODITIES</th>
<th>NON MPS COMM</th>
<th>MPS commodities in VP 2006 %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Country</td>
<td>WT MA RY BA SO OT</td>
<td>OG5 RI RS SP FB SH PK PT EG</td>
<td>AP BN CC CF CT CU FL GA GR MN OR PN PO PP PR SP SW TB TM WI WM WO XE</td>
<td></td>
</tr>
<tr>
<td>Australia</td>
<td>x x x x x x x x x x x x x x x x</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Canada</td>
<td>x x x x x x x x x x x x x x x x</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>EU25</td>
<td>x x x x x x x x x x x x x x x x</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Iceland</td>
<td>x x x x x x x x x x x x x x x x</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Japan</td>
<td>x x x x x x x x x x x x x x x x</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Korea</td>
<td>x x x x x x x x x x x x x x x x</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mexico</td>
<td>x x x x x x x x x x x x x x x x</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Norway</td>
<td>x x x x x x x x x x x x x x x x</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>New Zealand</td>
<td>x x x x x x x x x x x x x x x x</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Switzerland</td>
<td>x x x x x x x x x x x x x x x x</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Turkey</td>
<td>x x x x x x x x x x x x x x x x</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>USA</td>
<td>x x x x x x x x x x x x x x x x</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Brazil</td>
<td>x x x x x x x x x x x x x x x x</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>China</td>
<td>x x x x x x x x x x x x x x x x</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Russia</td>
<td>x x x x x x x x x x x x x x x x</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>South Africa</td>
<td>x x x x x x x x x x x x x x x x</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ukraine</td>
<td>x x x x x x x x x x x x x x x x</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

1. Wheat is considered a single commodity but may be a composite of durum wheat and common wheat as in the case of the European Union.
2. Other Grain is considered a single commodity but may be a composite of rye, barley, sorghum and/or oats.

<table>
<thead>
<tr>
<th>COMMODITIES</th>
<th>MPS COMMODITIES (AMC)</th>
<th>ADDITIONAL MPS COMMODITIES</th>
<th>NON MPS COMM</th>
<th>MPS commodities in VP 2006 %</th>
</tr>
</thead>
<tbody>
<tr>
<td>AP – Apples</td>
<td>BA – Barley</td>
<td>BF – Beef and veal</td>
<td>BN – Dried beans</td>
<td>CC – Chinese cabbage</td>
</tr>
<tr>
<td>CT – Cotton</td>
<td>CU – Cucumber</td>
<td>EG – Eggs</td>
<td>FL – Plants &amp; flowers</td>
<td>GA – Garlic</td>
</tr>
<tr>
<td>MA – Maize</td>
<td>MK – Milk</td>
<td>MN – Mandarin</td>
<td>OG – Other grains</td>
<td>OR – Oranges</td>
</tr>
<tr>
<td>PK – Porkmeat</td>
<td>PN - Peanuts</td>
<td>PO – Potatoes</td>
<td>PP – Red pepper</td>
<td>PR – Pears</td>
</tr>
<tr>
<td>SH – Sheepmeat</td>
<td>SO – Sorghum</td>
<td>SP – Spinach</td>
<td>SW – Strawberries</td>
<td>TB – Tobacco</td>
</tr>
</tbody>
</table>
Annex 6.1.

Commodity Groups Applied in OECD Countries

266. This annex, sourced from Agricultural Policies in OECD Countries: Monitoring and Evaluation 2007, provides illustrative information on the commodity groups identified in OECD countries. This grouping is based on a common set of groups which are most commonly found in the policies applied within OECD countries but leaves flexibility to reflect specific policy mixes. The generic categories are a menu. The selection of groups should provide an opportunity to categorise all programmes summed up as transfers to groups of products and may vary from year to year as new programmes are added and continuing programmes may be modified. The Secretariat will continue to improve the consistency of the groups used in the different countries, i.e. the same group name should have the same meaning in terms of commodities covered.

Australia

267. Four different commodity groups have been defined for Australia based on the policies in place over the period starting in 1986. These are:

- **All crops**: includes mostly disaster payments and weed strategy payments;
- **Fruits and vegetables**: disease control and eradication payments;
- **All livestock**: payments related to animal identification and control and disease control and eradication;
- **Ruminants**: disease control and eradication payments.

Canada

268. Three different commodity groups have been defined for Canada based on the policies in place over the period starting in 1986. These are:

- **Crops**: includes any policy that is available to producers of any grain or oilseed crop.
- **Livestock**: includes policies directed at producers of livestock, including cattle, pigs, dairy, and poultry. Some examples are the BSE Recovery Program (2003), and the Feed Freight Assistance Program (until 1995).
- **All commodities except supply managed**: includes Canada’s major agricultural support polices, including the stabilisation component of the Canadian Agricultural Income Stabilisation (CAIS) programme (started 2003) and the Net Income Stabilization Account (NISA) programme (1994-2002).
European Union

269. Twelve different commodity groups have been defined for the EU based on the policies in place over the period starting in 1986. These commodity groups are:

- **All crops**: includes any policy that is available to producers of any crop, such as measures for irrigation, pest control or environmentally friendly crop farming.

- **All arable crops**: includes any policy that is available to producers of any crop. This group is only used for measures such as payments for crop rotation, as most area payments under Agenda 2000 were restricted to COP (see below).

- **Cereals, oilseeds and protein crops (COP)**: includes any policy that is available to producers of any COP crop, such as set-aside payments and Agenda 2000 area payments after 2003.

- **Grains**: includes payments per hectare of cereals, with a rate per ha for any cereal different from that for oilseeds or protein crops. They were introduced by the 1992 reform. In 2004, these payments became part of the COP group.

- **Oilseeds**: includes payments per hectare of oilseeds, with a rate per ha for any oilseed different from that for cereals or protein crops.

- **Protein crops**: includes payments per hectare of protein crops, with a rate per ha for any protein crops different from that for cereals or oilseeds.

- **All fruits and vegetables**: includes measures for the whole fruit and vegetable sector, such as measures for orchard improvement.

- **Other crops**: includes payments to crops other than COP, including grass and forage crops.

- **All livestock**: includes policies directed at producers of livestock, including cattle, pigs, dairy, and poultry. Examples are measures for disease control, breeding improvement, compensating losses or manure handling, as well as some regional payments.

- **Ruminants**: includes payments for beef, sheep and goats such as less-favoured area payments before 2000, which were paid per livestock unit.

- **Non-ruminants**: No payment is made specifically to non-ruminants in EU member states.

- **Milk and beef**: includes payments to the dairy sector, which cannot be associated to either milk production of meat production, such as investments in stables.

Iceland

270. Three different commodity groups have been defined for Iceland based on the policies in place over the period starting in 1986. These commodity groups are:

- **Livestock**: includes policies directed at producers of livestock, including cattle, pigs, dairy, and poultry. An example is the animal breeding programme.

- **Ruminants**: includes policies directed at producers of cattle, dairy and sheepmeat.
• **Sheepmeat and poultry:** includes policies directed at producers of sheepmeat and poultry. An example is the animal disease control programme.

**Japan**

271. Two different commodity groups have been defined for Japan based on the policies in place over the period starting in 1986. These commodity groups are:

- **Livestock:** includes policy directed at producers of livestock, including cattle, pigs, dairy, and poultry. Animal disease control programme is an example.

- **Wheat, barley and soybeans:** includes policy that is available to producers of wheat, barley and soybeans.

**Korea**

272. Four different commodity groups have been defined for Korea based on the policies in place over the period starting in 1986. These commodity groups are:

- **All crops:** includes any policy that is available to producers of any crop. This set of transfers includes payments based on input use such as fertilizer, seeds and pesticides. In more recent years (starting from 1999), this group includes also payments for set-aside, direct payment for environment-friendly farming practices, paddy-field environmental conservation payment and direct payment for landscape preservation.

- **All livestock:** includes policies directed at producers of livestock, including cattle, pigs, dairy, and poultry. The transfers in this category include three programmes; direct payment for environment-friendly livestock practices, payments for management of livestock waste, and credit concessions to livestock farmers.

- **Beef and pigmeat:** includes payments in the meat quality enhancement programme. It is the payments per head of animal to encourage good quality beef and pigmeat.

- **Beef and milk:** includes payments in the cattle reproduction programme which includes artificial insemination.

**Mexico**

273. Two main commodity groups have been defined for Mexico based on the policies in place over the period starting in 1986. These commodity groups are:

- **Crops:** includes any policy that is available to producers of any grain or oilseed crop. Most of the policies in this group belong to ALIANZA. This group of policies decreased in importance in the GCT between 1991-93 and 2004-06, decreasing from 6 to 2%.

- **Livestock:** group includes policies directed at producers of livestock, including cattle, pigs, dairy, and poultry. Some examples are ALIANZA programs such as the Livestock Improvement, and the Genetic Improvement. This group of policies has become an important part of the GCT in 2004-06, but was not used at all in the base period of 1991-93.
• Several smaller groups of commodities emerged, such as fruits, flowers, industrial crops, and alternative crops. Some of these payments are sub-national to take advantage of specific agro climatic conditions. None of these payments was materialized recently.

New Zealand

274. Two different commodity groups have been defined for New Zealand based on the policies in place over the period starting in 1986. These commodity groups are:

• All livestock: includes the payments on animal disease control programmes that seek to safeguard the health of the agricultural animal population. These programmes include export quality assurance for live animals, the reduction of production limiting diseases, disease surveillance and disease eradication. This payment represented 100% of GCT since 1993 when the payments for the other group (sheepmeat, wool, beef and milk) were completely stopped.

• Sheepmeat, wool, beef and milk: includes policies directed at producers of sheep and cattle. The transfers in this category represent payments in seven programmes; labour subsidy programme, fertilizer price subsidy programme, livestock incentive scheme, land development and encouragement loan scheme, interest concession programme from the rural bank and finance corporation, debt discounting write-off programme from the rural bank and finance corporation, the debt write-off programme for producer boards. The payments for this category were completely stopped in 1992 as the reform of these sectors was accomplished.

Norway

275. Eleven different commodity groups have been defined for Norway based on the policies in place over the period starting in 1986. The main commodity groups are:

• All crops: includes any policy that is available to producers of any crop, such as measures for irrigation, pest control or environmentally friendly crop farming.

• Grains: includes payments based on output, payments per hectare of grains, transport subsidies, and regional subsidies.

• All livestock: includes payments to producers of livestock, including cattle, pigs, dairy, and poultry. Examples are deficiency payments, headage payments, and the vacation and temporary substitute scheme for livestock producers, as well as some regional payments.

• Feed crops: includes all subsidies to coarse feed, including acreage support to mountain farming, and support to meadowseed storage.

Switzerland

276. Eight different commodity groups have been defined for Switzerland based on the policies in place over the period starting in 1986 (6 of them were used in 2004-06). These commodity groups are:

• All livestock: This set of transfers includes policies that are available to livestock raised in difficult conditions (Livestock in mountain areas, 1986-98; livestock in difficult conditions, 1999-2006). At a later stage this group includes also payments for animal welfare (Payments for Animal housing systems, from 1996; Payments for keeping animal outdoors, from 1999).
• **Ruminants:** The transfers in the category represent payments of two programmes Base area payment for grassland (1993-98) and Payments for roughage eating animals (from 1999). The programme consists of headage payments available to all producers for ruminants (beef, sheep and goats, horses, lamas, alpagas, etc.).

• **All crops:** includes any policy that is available to producers of any crop. This set of transfers includes payments based on input use such as fertilizer, seeds and pesticides. However, the most important part of transfers within this group were the payments for integrated production (1992-98).

• **Arable crops:** transfers to this group are mainly the Base area payment to arable land applied in the 1992-98 period.

• **Grains:** includes mainly the Base premium for coarse grains (1986-2000), relatively small amounts of payments were for Extensive production of grains (1992-98).

• **Oilseeds:** Area payments for oilseeds (from 1999).

• **Grains and oilseeds:** Area payments for extensive grains and rapeseed cultivation (from 1999).

• **All crops except wine:** Payments for crop production on steep slopes.

**Turkey**

277. Six different commodity groups have been identified, based on the policies in place over the period starting in 1986.

• **All Crops:** primarily includes support for input use, such as fertiliser subsidies, pesticide subsidies, hybrid seed subsidies and support for natural disasters.

• **All Livestock:** includes transfers to livestock producers in the form of input support, such as support for feed, capital grants, livestock replacement and control of disease.

• **Milk, beef and sheepmeat:** includes support to producers of cattle, dairy and sheep for animal replacement due to natural disasters through the Livestock Replacement Programme and for pasture improvement.

• **Irrigated crops:** Electricity and irrigation Subsidies

• **Wheat, Sugar, Cotton, Sunflower:** includes payments under the On Farm Development Support Programme.

• **Hazelnuts and tobacco:** includes payments under the Transition Programme.

**United States**

278. There are eight different commodity groups, based on the policies in place over the period starting in 1986. Of these, the first four accounted for all of GCT support in 2004-06.

• **All Crops:** primarily includes payments for environmental conservation and protection purposes. Examples of programmes in this group include the Farmland Protection Program, Conservation
Security Program, Environmental Quality Improvement Program and Conservation Technical Assistance Program.

- **Programme crops**: includes payments to producers of wheat, feed grains, upland cotton, rice, oilseeds tobacco and peanuts under the Crop Disaster Payments Program.

- **Irrigated crops**: includes support for irrigation provided through the Reclamation Program.

- **Milk, beef and sheepmeat**: includes support to producers of cattle, dairy and sheep under the Feed Assistance Program and the Grassland Reserve Program.

- **Non-program crops**: includes payments under the Non-insured Crops Disaster assistance program.

- **Milk and beef**: includes payments under the Livestock Indemnity Program.

- **Beef and sheepmeat**: includes payments for grazing support.

- **Tree and vineyard**: includes payments under the Tree and Vineyard Disaster Payments Program.
Annex 6.2.
Comparing the OECD Indicators of Support to Producers
with Other Measures of Support

279. In addition to the OECD indicators, there are a range of other measures which can be used to calculate support provided to agriculture. These have various strengths and limitations, and the choice among such measures depends on both practical considerations such as data availability and on the nature of the issues to be analysed.

Comparison with other economic measures

280. There are four widely known measures that are used in various studies to estimate support: the nominal rate of protection (NRP), the nominal rate of assistance (NRA), the effective rate of protection (ERP) and the effective rate of assistance (ERA). The NRP measures the increase in gross receipts from the sale of the commodity; the NRA measures the increase in gross receipts including support not linked to the sale of the commodity. The ERA measures the increase in the value added from the sale of the commodity, i.e. taking into account the price of inputs: the ERA measures the increase in value added from both the sale of the commodity and support not linked to the sale of the commodity.

281. Consequently, the measures can be distinguished with regard to the breadth and depth of policy coverage, and the economic value used for measuring the level of support (Table A6.2). In terms of policy coverage, assistance measures (NRA and ERA) are broader than protection measures (NRP and ERP) in the sense that they include a wider range of support policies for a particular sector than just policies that affect output prices. The NRA builds on the NRP by including, for example, payments based on area or animal numbers.

282. Effective measures (ERP and ERA) are deeper than nominal measures (NRP and NRA) in the sense that they also take into account the impact of government policies which support (or tax) the input sectors, affecting the cost of intermediate inputs. The ERP extends the NRP by taking into account the protection provided through border policies on intermediate inputs, e.g. tariffs raising farmers’ input costs. However, the ERP is not as broad as the NRA in terms of the sectoral support policies included. The ERA is the most comprehensive measure. The effective measures take into account assistance on production and the inputs used. They measure the assistance to the activity rather than to the product itself.

Table A6.2. Policy coverage of other measures of support

<table>
<thead>
<tr>
<th>Policies affecting the price of intermediate inputs included (depth)</th>
<th>Sectoral policies included (breadth)</th>
<th>Policies affecting the market price (e.g. tariffs)</th>
<th>plus other support policies (e.g. input subsidies)</th>
</tr>
</thead>
<tbody>
<tr>
<td>No</td>
<td>NRP</td>
<td>NRA</td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>ERP</td>
<td>ERA</td>
<td></td>
</tr>
</tbody>
</table>

283. In terms of the economic value used for measuring support, nominal measures are calculated on a revenue basis, with the level of support being the increase in revenue in the presence of the policies relative to output valued at world prices. In comparison, effective measures are calculated on a value-added basis, with the level of support being the change in value-added relative to the estimate of value-
added at world prices. Effective coefficients may be negative indicating that the protection/assistance offered on the final product is more than offset by the impact of protection/assistance on intermediate inputs.

284. The main advantage of effective measures is that they show the potential impact of government intervention on resource allocation since resources move between alternative activities not according to gross revenue but in accordance with the return to factors employed in that sector. The superiority of effective measures over nominal measures is more pronounced the more important input policies are and the smaller the share of value-added in the producer return (Josling and Tangermann, 1989). However, the calculation of effective measures requires detailed input-output coefficients which can be difficult to find, as well as a greater range of sectors for which policy measures need to be found and transfer values determined.

285. Comparing the OECD indicators with these four standard measures, it can be observed that the former are nominal rather than effective measures of support. Like the NRP and NRA, the indicators use revenue as the economic unit in which to measure support, both revenue including transfers arising from policies and revenue at border prices. For example, the consumer NPC indicator is a NRP measure, comparing a market price as a result of policies with a border price. The producer NPC indicator is slightly broader in that it also takes into account the impact on producer prices of policies that do not impact on the market price but on producer prices, e.g. deficiency payments.

286. In terms of policy coverage the PSE (and its derived indicators the %PSE and producer NAC) is a broader measure of support than the NRP, and closer to a NRA in that in addition to output based support it includes other policies. The PSE includes support to input sectors when it is provide to support agricultural production, e.g. a subsidy on the use of fertiliser, but does not include support for the input sector which has the effect of taxing agricultural production, e.g. tariffs on fertiliser. The advantage of the OECD indicators over effective measures is that they need less data, and are therefore simpler to calculate and more suitable to annual calculation.

Comparison with the WTO Aggregate Measure of Support

287. OECD indicators are often compared to the measures of support developed to establish and monitor the implementation of the domestic support reduction commitments under the WTO Uruguay Round Agreement on Agriculture (URAA). In particular, the PSE is often compared to the Aggregate Measurement of Support (AMS). Because the AMS was developed from the concept of the PSE, both indicators are constructed in a similar way. Both include market price support, budgetary outlays and revenue foregone by governments; account for national and sub-national support; deduct agricultural specific levies or fees paid by producers, and are measured on an annual basis.

288. However, while the AMS is conceptually based on the PSE, it has been done in context of international trade negotiations. Consequently, the AMS has some unique characteristics which are not necessarily based on purely economic criteria. As with the four economic measures discussed above, distinctions between the PSE and the AMS can be made in terms of policy coverage and economic value used to measure support (Diakosavvas, 2002).

289. In terms of policy coverage, the AMS is a narrower concept than the PSE, designed to only cover domestic policies considered trade distorting. In contrast to the PSE, the AMS does not include support to producers provided through:

---

11. Value-added is the difference between the value of final production and the value of the intermediate inputs entering into production.
• trade policies, e.g. tariffs and export subsidies, because these policies are covered under the market access and export competition disciplines of the URAA, and includes an estimate of market price support only when an administered price exists

• programmes that meet the specific production limiting requirements of Article 6, paragraph 5 of the URAA, the “Blue Box”

• policies that meet the criteria of Annex 2 of the URAA, the “Green Box”

• policies that would otherwise be included but are excluded because the level of product specific or non-product specific domestic support falls below a specified de minimus level, 5% for developed and 10% for developing countries of the value of production (Article 6, paragraph 4 of the URAA)

290. In terms of economic value, while the PSE is a measure of actual “current” support to agricultural producers, the AMS is not. Although both indicators include Market Price Support, there are important differences in the way that it is calculated. In the PSE, MPS is calculated using current prices, i.e. domestic producer and reference prices pertaining to the year in question. In the AMS, MPS is calculated using domestic administrative support prices and a fixed reference price, defined as border prices in domestic currency in a base period, generally the three year 1986-88 average. The value of MPS calculated in the AMS does not provide a figure for the support actually being received by producers.

291. In comparison to the PSE, the AMS is therefore narrower in scope and does not measure “current” support to agricultural producers. Given the different purposes for which the two methodologies were developed they are bound to differ, and caution should be exercised when comparing them. While the WTO methodology is a legal device for negotiating and monitoring domestic support commitments, the OECD methodology aims at obtaining a comprehensive economic picture of the actual level and composition of agricultural support.

12. It should be noted that policies excluded from the AMS because they meet the requirements of paragraph 2 (General Services) of the Green Box are also not included in the PSE, and are instead included in the GSSE.
CHAPTER 7.
CALCULATING INDICATORS OF SUPPORT TO CONSUMERS

292. 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 to obtain consumer single commodity transfers for individual commodities. These are then used to calculate a CSE for the country as a whole. From these nominal indicators, the relative indicators of support can then be derived.

Diagram 7.1. The procedure for calculating consumer support indicators

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

<table>
<thead>
<tr>
<th>Monetary indicators</th>
<th>Percentage indicators or ratios</th>
</tr>
</thead>
<tbody>
<tr>
<td>MPS_i</td>
<td>consumer NPC_i</td>
</tr>
<tr>
<td>consumer SCT_i</td>
<td>%CSE and consumer NAC</td>
</tr>
</tbody>
</table>

7.1. 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.

293. The process begins by calculating a consumer SCT value for each of the individual commodities for which MPS has been calculated in section 6.1.1.

\[
consumer\text{SCT}_i = TCT_i - (TPC_i + OTC_i) + EFC_i
\]  

[7.1]

where: 

- \( TCT_i \) – Transfers to Consumers from Taxpayers for commodity \( i \)
- \( TPC_i \) – Transfers to Producers from Consumers of commodity \( i \)
294. TCT are budgetary payments to consumers that are given for the specific purposes 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 an observed value, obtained from the information on budgetary expenditures.

295. The sum of other three components corresponds to Price Transfers from Consumers (PCT), explained in detail in section 4.3.

296. The information and analysis used to calculate MPS in 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: for 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 in this case, 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).

297. Tables 7.1 demonstrate 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 (USD 22 million) in this calculation is the same as that calculated for MPS (Table 6.3), except that in this case it is added back into transfers from consumers rather than subtracted out of transfers to producers.

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Description</th>
<th>Units</th>
<th>Wheat</th>
<th>Barley</th>
<th>Oats</th>
<th>Milk</th>
<th>Beef</th>
<th>Cotton</th>
<th>Potato</th>
<th>Source/equation</th>
</tr>
</thead>
<tbody>
<tr>
<td>QPi</td>
<td>Level of production</td>
<td>000t</td>
<td>250</td>
<td>100</td>
<td>50</td>
<td>200</td>
<td>100</td>
<td>360</td>
<td>160</td>
<td>data</td>
</tr>
<tr>
<td>QC</td>
<td>Level of consumption</td>
<td>000t</td>
<td>200</td>
<td>150</td>
<td>200</td>
<td>300</td>
<td>75</td>
<td>400</td>
<td>120</td>
<td>data or (QP + OM - QX)</td>
</tr>
<tr>
<td>QCfeed</td>
<td>Quantity of i consumed for feed</td>
<td>000t</td>
<td>90</td>
<td>110</td>
<td>40</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>data or QTfeed + QMfeed + QXfeed</td>
</tr>
<tr>
<td>MPD</td>
<td>Market Price Differential</td>
<td>$/T</td>
<td>170</td>
<td>60</td>
<td>650</td>
<td>500</td>
<td>50</td>
<td>0</td>
<td>0</td>
<td>data</td>
</tr>
<tr>
<td>TCT</td>
<td>Transfer to consumers from taxpayers</td>
<td>$ million</td>
<td>0</td>
<td>0</td>
<td>50</td>
<td>0</td>
<td>10</td>
<td>0</td>
<td>0</td>
<td>data</td>
</tr>
<tr>
<td>TPC</td>
<td>Transfers to producers from consumers</td>
<td>$ million</td>
<td>34</td>
<td>6</td>
<td>130</td>
<td>38</td>
<td>18</td>
<td>0</td>
<td>0</td>
<td>If QC&gt;QP then MPD<em>QP otherwise MPD</em>QC</td>
</tr>
<tr>
<td>OTC</td>
<td>Other transfers from consumers</td>
<td>$ million</td>
<td>0</td>
<td>3</td>
<td>65</td>
<td>0</td>
<td>2</td>
<td>0</td>
<td>0</td>
<td>If QC&gt;QP then MPD*(QC-QP) otherwise 0</td>
</tr>
<tr>
<td>EFC</td>
<td>Excess Feed Cost</td>
<td>$ million</td>
<td>15</td>
<td>7</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>MPD* QCfeed</td>
</tr>
<tr>
<td>consumer SCT</td>
<td>Consumer Single Commodity Transfer</td>
<td>$ million</td>
<td>-19</td>
<td>-2</td>
<td>-40</td>
<td>-38</td>
<td>-10</td>
<td>0</td>
<td>0</td>
<td>TCT, TPC, OTC, EFC, (for crop producer)</td>
</tr>
</tbody>
</table>

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.

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

\[
CSE_C = TCT_C - (TPC_C + OTC_C) + EFC_C
\] [7.2]

299. 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:
\[ TCT_c = \sum_{i \in AMC} TCT_i + TCT_{XE} \]  

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

\[ EFC_c = \sum_{i \in AMC} EFC_i \]

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

\[ TPC_c = \frac{\sum_{i \in AMC} TPC_i}{\sum_{i \in AMC} VP_i} \times VP_c \quad \text{and} \quad OTC_c = \frac{\sum_{i \in AMC} OTC_i}{\sum_{i \in AMC} VP_i} \times VP_c \]

\[ \text{where: } \sum_{i \in AMC} TPC_i - \text{sum of TPC for the set of all commodities for which MPS has been calculated} \]
\[ \sum_{i \in AMC} OTC_i - \text{sum of OTC for the set of all commodities for which MPS has been calculated} \]
\[ \sum_{i \in AMC} VP_i - \text{sum of value of production for the set of all commodities for which MPS has been calculated} \]

302. Table 7.2 demonstrates this procedure.

**Table 7.2. Calculation of CSE (example)**

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Description</th>
<th>$ million</th>
<th>Source/equation</th>
</tr>
</thead>
<tbody>
<tr>
<td>VP</td>
<td>Total value of production (at farm gate)</td>
<td>2 325</td>
<td>data</td>
</tr>
<tr>
<td>VPAMC</td>
<td>Value of production of MPS commodities</td>
<td>1 683</td>
<td>Sum of VP, of MPS commodities</td>
</tr>
<tr>
<td>TCT</td>
<td>Transfers to consumers from taxpayers</td>
<td>70</td>
<td>TPTAMC + TPTother</td>
</tr>
<tr>
<td>TPTAMC</td>
<td>Transfers to consumers from taxpayers of MPS commodities</td>
<td>60</td>
<td>Sum of TPT, of MPS commodities</td>
</tr>
<tr>
<td>TPTother</td>
<td>Transfers to consumers for others</td>
<td>10</td>
<td>data</td>
</tr>
<tr>
<td>TPC</td>
<td>Transfers to producers from consumers</td>
<td>312</td>
<td>TPCAMC / VPAMC * VP</td>
</tr>
<tr>
<td>TPCAMC</td>
<td>Transfers to producers from consumers of MPS commodities</td>
<td>226</td>
<td>Sum of TPC, of MPS commodities</td>
</tr>
<tr>
<td>OTC</td>
<td>Other transfers from consumers</td>
<td>97</td>
<td>OTCAMC / VPAMC * VP</td>
</tr>
<tr>
<td>OTCAMC</td>
<td>Other transfers from consumers of MPS commodities</td>
<td>70</td>
<td>Sum of OTC, of MPS commodities</td>
</tr>
<tr>
<td>EFC</td>
<td>Excess Feed Cost</td>
<td>22</td>
<td></td>
</tr>
<tr>
<td>CSE</td>
<td>Consumer Support Estimate</td>
<td>-316</td>
<td>TCT-TPC-OTC+EFC</td>
</tr>
</tbody>
</table>
7.2. 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).

303. 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 can be expressed as:

\[
\%CSE_C = \frac{CSE_C}{VC_C - TCT_C} \times 100
\]  

where: \( VC_C \) – value of consumption in country C

304. The national (aggregate) value of consumption is found by extrapolating the sub-total value of consumption for the set of individual commodities for which MPS is calculated:

\[
VC_C = \sum_{i}^{VCi} \sum_{i}^{VCi} (PP_i \times QC_i) \sum_{i}^{VPi} \sum_{i}^{VPi} \times VP_C
\]  

where: \( \sum_{i}^{VCi} \) – sum of VC for the set of all commodities for which MPS has been calculated

\( \sum_{i}^{VPi} \) – sum of VP for the set of all commodities for which MPS has been calculated

305. The value of consumption for an individual 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)

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

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Description</th>
<th>Units</th>
<th>Year</th>
<th>Source/equation</th>
</tr>
</thead>
<tbody>
<tr>
<td>VP</td>
<td>Total value of production (at farm gate)</td>
<td>$ million</td>
<td>2 325</td>
<td>data</td>
</tr>
<tr>
<td>VP&lt;sub&gt;AMC&lt;/sub&gt;</td>
<td>Value of production of MPS commodities</td>
<td>$ million</td>
<td>1 683</td>
<td>Sum of VP&lt;sub&gt;i&lt;/sub&gt; of MPS commodities</td>
</tr>
<tr>
<td>VC</td>
<td>Total value of consumption (at farm gate)</td>
<td>$ million</td>
<td>2 648</td>
<td>VC&lt;sub&gt;AMC&lt;/sub&gt; * VP / VP&lt;sub&gt;AMC&lt;/sub&gt;</td>
</tr>
<tr>
<td>VC&lt;sub&gt;AMC&lt;/sub&gt;</td>
<td>Value of consumption of MPS commodities</td>
<td>$ million</td>
<td>1 917</td>
<td>Sum of VC&lt;sub&gt;i&lt;/sub&gt; of MPS commodities</td>
</tr>
<tr>
<td>CSE</td>
<td>Consumer Support Estimate</td>
<td>$ million</td>
<td>-316</td>
<td></td>
</tr>
<tr>
<td>TCT</td>
<td>Transfers to consumers from taxpayers</td>
<td>$ million</td>
<td>70</td>
<td></td>
</tr>
<tr>
<td>%CSE</td>
<td>Percentage Consumer Support Estimate</td>
<td>%</td>
<td>-12</td>
<td>CSE / (VC - TCT) * 100</td>
</tr>
<tr>
<td>consumer NAC</td>
<td>Consumer Nominal Assistance Coefficient</td>
<td>ratio</td>
<td>1.14</td>
<td>VC / (VC + CSE) * (100 - %CSE) / (100 + %CSE)</td>
</tr>
</tbody>
</table>
306. The consumer NAC is calculated by dividing the value of consumption by the value of consumption at border prices. Expressed algebraically:

\[
\text{consumer}\text{NAC}_c = \frac{VC_c}{VC_c + CSE_c}
\] [7.7]

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

\[
\text{consumer}\text{NAC}_c = 1 - \frac{\%CSE_c}{100 - \%CSE_c}
\] [7.8]

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

### 7.3. 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).

309. Like 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) producer NPC.

#### 7.3.1. Consumer NPC for individual commodities

310. The consumer NPC for an individual commodity is derived by comparing domestic and border prices, where the domestic price is the consumption price plus the per unit transfers received from payments based on output:

\[
\text{consumer}\text{NPC}_i = \frac{PP_i}{RP_i}
\] [7.9]

where: 
- \(PP_i\) – consumer price of commodity \(i\)
- \(RP_i\) – reference price of commodity \(i\)

311. The difference between the consumer and producer NPC is that the later includes the per unit value of output support that is provided to producers through policies which do not affect market prices. Table 6.12 illustrates the calculation of consumer NPC for individual commodities.

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

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Description</th>
<th>Units</th>
<th>Wheat</th>
<th>Barley</th>
<th>Oats</th>
<th>Milk</th>
<th>Beef</th>
<th>Cotton</th>
<th>Potato</th>
<th>Source/equation</th>
</tr>
</thead>
<tbody>
<tr>
<td>QC_i</td>
<td>Level of consumption</td>
<td>Q000t</td>
<td>200</td>
<td>150</td>
<td>200</td>
<td>300</td>
<td>75</td>
<td>400</td>
<td>120</td>
<td></td>
</tr>
<tr>
<td>PP_i</td>
<td>Producer price (at farm gate)</td>
<td>$/t</td>
<td>2,060</td>
<td>1,260</td>
<td>1,040</td>
<td>2,000</td>
<td>2,500</td>
<td>500</td>
<td>1,000</td>
<td></td>
</tr>
<tr>
<td>RP_i</td>
<td>Reference Price (at farm gate)</td>
<td>$/t</td>
<td>1,890</td>
<td>1,200</td>
<td>1,040</td>
<td>1,350</td>
<td>2,000</td>
<td>450</td>
<td>1,000</td>
<td></td>
</tr>
<tr>
<td>TPC_i</td>
<td>Transfers to producers from consumers</td>
<td>$ million</td>
<td>34</td>
<td>6</td>
<td>0</td>
<td>130</td>
<td>38</td>
<td>18</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>OTC_i</td>
<td>Other transfers from consumers</td>
<td>$ million</td>
<td>0</td>
<td>3</td>
<td>0</td>
<td>65</td>
<td>0</td>
<td>2</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>VC_i</td>
<td>Value of consumption (at farm gate)</td>
<td>$ million</td>
<td>412</td>
<td>189</td>
<td>208</td>
<td>600</td>
<td>188</td>
<td>200</td>
<td>120</td>
<td>PP_i * QC_i</td>
</tr>
<tr>
<td>consumer NPC_i</td>
<td>Consumer NPC_i (ratio)</td>
<td>1.09</td>
<td>1.05</td>
<td>1.00</td>
<td>1.48</td>
<td>1.25</td>
<td>1.11</td>
<td>1.00</td>
<td></td>
<td>PP_i / RP_i, or VC_i / (VC_i - TPC_i - OTC_i)</td>
</tr>
</tbody>
</table>
7.3.2. Consumer NPC for a country

312. Once consumer NPC values have been calculated for each of the individual commodities, a national (aggregate) NPC can be derived. 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:

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

where:  

- \( VP_c \) – 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 \( C \)

313. 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. This is also shown in Table 7.4.

314. 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 the commodities for which MPS has been calculated. 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 consumers.

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Description</th>
<th>Units</th>
<th>MPS commodities</th>
<th>Total</th>
<th>Source/equation</th>
</tr>
</thead>
<tbody>
<tr>
<td>VC(_C)</td>
<td>Value of consumption (at farm gate)</td>
<td>$ million</td>
<td>1 917</td>
<td>2 648</td>
<td></td>
</tr>
<tr>
<td>TPC(_C)</td>
<td>Transfers to producers from consumers</td>
<td>$ million</td>
<td>226</td>
<td>312</td>
<td>( TP_{CAMC} \times VP_{AMC} / VP_{AMC} )</td>
</tr>
<tr>
<td>OTC(_C)</td>
<td>Other transfers from consumers</td>
<td>$ million</td>
<td>70</td>
<td>97</td>
<td>( TP_{TAMC} \times VP_{AMC} / VP_{AMC} )</td>
</tr>
<tr>
<td>consumer NPC</td>
<td>consumer NPC(_C)</td>
<td>ratio</td>
<td>1.18</td>
<td>1.18</td>
<td>( VC_c / (VC_c - TPC_c - OTC_c) )</td>
</tr>
</tbody>
</table>

7.3.3. Consumer NPC for other commodities

315. 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:

\[
\text{consumerNPC}_{oc} = \frac{(VC_c - \sum_{i \in SMC} VP_i)}{(VC_c - \sum_{i \in SMC} VC_i) - (TPC_c - \sum_{i \in SMC} TPC_i) - (OTP_c - \sum_{i \in SMC} OTP_i)} \quad [7.14]
\]

316. 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.
Table 7.6. Calculation of a consumer NPC for Other Commodities (example)

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Description</th>
<th>Units</th>
<th>Standard MPS commodities</th>
<th>Other commodities</th>
<th>Source/equation</th>
</tr>
</thead>
<tbody>
<tr>
<td>VC&lt;sub&gt;i&lt;/sub&gt;</td>
<td>Value of consumption (at farm gate)</td>
<td>$ million</td>
<td>2 648</td>
<td>1 597</td>
<td>1 051</td>
</tr>
<tr>
<td>TPC&lt;sub&gt;i&lt;/sub&gt;</td>
<td>Transfers to producers from consumers</td>
<td>$ million</td>
<td>312</td>
<td>208</td>
<td>104</td>
</tr>
<tr>
<td>OPT&lt;sub&gt;i&lt;/sub&gt;</td>
<td>Other transfers from consumers</td>
<td>$ million</td>
<td>97</td>
<td>68</td>
<td>29</td>
</tr>
<tr>
<td>NPC&lt;sub&gt;C&lt;/sub&gt;</td>
<td>Producer NPC</td>
<td>ratio</td>
<td>1.18</td>
<td>1.21</td>
<td>1.14</td>
</tr>
</tbody>
</table>
CHAPTER 8.
CALCULATING INDICATORS OF SUPPORT TO GENERAL SERVICES AND TOTAL SUPPORT TO AGRICULTURE

317. This chapter explains the calculation of indicators that measure support provided to producers through general services to agriculture, and that provided to the sector as a whole. The procedure for calculating these indicators is summarised in Diagram 8.1. The process begins by calculating the General Service Support Estimate (GSSE) (section 8.1). This is combined with the value of transfers calculated in the PSE and CSE to calculate the Total Support Estimate (TSE), with care taken to avoid double-counting of transfers (section 8.2). From these two absolute indicators, the relative indicators of support, the %GSSE and the %TSE are derived (section 8.3). As indicated by Diagram 8.1, these indicators are only calculated at the national (aggregate) level and not at the commodity or group of commodities level.

Diagram 8.1. The procedure for calculating indicators of support to the sector

<table>
<thead>
<tr>
<th>Commodity or groups of Level</th>
<th>Monetary indicators</th>
<th>Percentage indicators</th>
</tr>
</thead>
<tbody>
<tr>
<td>National (aggregate) Level</td>
<td>GSSE</td>
<td>%GSSE</td>
</tr>
<tr>
<td></td>
<td>PSE</td>
<td>%TSE</td>
</tr>
<tr>
<td></td>
<td>CSE</td>
<td></td>
</tr>
</tbody>
</table>

8.1. General Services Support Estimate (GSSE)

**General Services Support Estimate (GSSE):** the annual monetary value of gross transfers to general services provided to agriculture as a sector (such as research, development, training, inspection, marketing and promotion), arising from policy measures that support agriculture regardless of their nature, objectives and impacts on farm production, income, or consumption. The GSSE does not include any payments to individual producers.

318. The GSSE measures the value of transfers provided through policies that support producers collectively rather than an individual producers. The GSSE can be estimated as:

\[ GSSE_c = \sum TGS_p = \sum GSSEC_{category}_c \]  

Where: \( GSSE_c \) – GSSE for country \( C \)
$TGS_p$ – Transfers to General Services from policy $p$

$GSSECategorie$ - GSSE categories to which policies are classified

319. A numerical example is presented in Table 8.1. In order to aid transparency and to assist in analysing the composition of the GSSE, the name of each policy and the resulting value of transfer are listed under the GSSE categories to which they have been classified according to the process set out in section 3.4

<table>
<thead>
<tr>
<th>Description</th>
<th>Source/equation</th>
</tr>
</thead>
<tbody>
<tr>
<td>General Services Support Estimate (GSSE)</td>
<td>H + I + J + K + L + M</td>
</tr>
<tr>
<td>H. Research and development</td>
<td>35</td>
</tr>
<tr>
<td>National Agricultural Research Institute</td>
<td>25</td>
</tr>
<tr>
<td>Organic agriculture research - tender</td>
<td>10</td>
</tr>
<tr>
<td>I. Agricultural schools</td>
<td>15</td>
</tr>
<tr>
<td>University bursary for farmers</td>
<td>10</td>
</tr>
<tr>
<td>Professorship</td>
<td>5</td>
</tr>
<tr>
<td>J. Inspection services</td>
<td>40</td>
</tr>
<tr>
<td>National Food Safety Authority</td>
<td>20</td>
</tr>
<tr>
<td>National Grain Inspection Service</td>
<td>20</td>
</tr>
<tr>
<td>K. Infrastructure</td>
<td>20</td>
</tr>
<tr>
<td>Irrigation and drainage development</td>
<td>10</td>
</tr>
<tr>
<td>Early Retirement Scheme</td>
<td>5</td>
</tr>
<tr>
<td>Purchase of milk quotas</td>
<td>5</td>
</tr>
<tr>
<td>L. Marketing and promotion</td>
<td>25</td>
</tr>
<tr>
<td>Market campaign to promote country's products</td>
<td>15</td>
</tr>
<tr>
<td>Commodity Grading Scheme</td>
<td>10</td>
</tr>
<tr>
<td>M. Public stockholding</td>
<td>5</td>
</tr>
<tr>
<td>Intervention storage of cotton</td>
<td>5</td>
</tr>
<tr>
<td>N. Miscellaneous</td>
<td>0</td>
</tr>
</tbody>
</table>
8.2. Total Support Estimate (TSE)

**Total Support Estimate (TSE):** The annual monetary value of all gross transfers from taxpayers and consumers arising from policies that support agriculture, net of the associated budgetary receipts, regardless of their objectives and impacts on farm production and income, or consumption of farm products.

320. Two methods can be used to calculate the TSE for a country. In practice, both are used to help ensure that all the indicators of support are correctly calculated (Table 8.2). The first method sums up the transfers distinguished by recipient, *i.e.* transfers to producers (PSE), transfers to general services (GSSE) and transfers to consumers from taxpayers, *i.e.* consumer subsidies (TCT):

\[
TSE_c = PSE_c + GSSE_c + TCT_c
\]  

[8.2]

321. The second method sums up the transfers distinguished by source, *i.e.* transfers from consumers and transfers from taxpayers (equation 8.3). The former is calculated by adding together the value of transfers from consumers to producers (TPC) and transfers from consumers to others (OTC). The latter is calculated by adding together the value of transfers from taxpayers to producers (the PSE less transfers from consumers to producers (TPC)), transfers from taxpayers to general services (GSSE) and the value of transfers from taxpayers to consumers (TCT), and subtracting transfers from consumers to others (OTC). This value is subtracted in recognition of the fact that these transfers offset to their value transfers from taxpayers, *i.e.* referred to as budget revenue:

\[
TSE_c = (TPC_c + OTC_c) + (((PSE_c - TPC_c) + GSSE_c + TCT_c) - OTC_c)
\]  

[8.3]

### Table 8.2. Calculation of TSE (example)

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Description</th>
<th>$ million</th>
<th>Source/equation</th>
</tr>
</thead>
<tbody>
<tr>
<td>PSE</td>
<td>Producer Support Estimate</td>
<td>685</td>
<td></td>
</tr>
<tr>
<td>GSSE</td>
<td>General Services Support Estimate</td>
<td>140</td>
<td></td>
</tr>
<tr>
<td>TCT</td>
<td>Transfers to consumer from taxpayers</td>
<td>83</td>
<td></td>
</tr>
<tr>
<td>TSE</td>
<td>Total Support Estimate (TSE)</td>
<td>908</td>
<td>PSE + GSSE + TCT</td>
</tr>
<tr>
<td>TFC</td>
<td>Transfers from consumers</td>
<td>408</td>
<td>TPC + OTC</td>
</tr>
<tr>
<td>TPC</td>
<td>Transfers to producers from consumers</td>
<td>312</td>
<td></td>
</tr>
<tr>
<td>OTC</td>
<td>Other transfers from consumers</td>
<td>97</td>
<td></td>
</tr>
<tr>
<td>TFT</td>
<td>Transfers from taxpayers</td>
<td>596</td>
<td>PSE - TPC + GSSE + TCT</td>
</tr>
<tr>
<td>BR</td>
<td>Budget revenues (-)</td>
<td>97</td>
<td>OTC</td>
</tr>
<tr>
<td>TSE</td>
<td>Total Support Estimate (TSE)</td>
<td>908</td>
<td>TFC + TFT - BR</td>
</tr>
</tbody>
</table>

322. It should be noted that both methods for calculating the TSE involve an assumption that the total value of transfers from consumers to others (OTC) is received as budget revenue.
8.3. Percentage GSSE (%GSSE) and Percentage TSE (%TSE)

**Percentage GSSE (%GSSE):** transfers to general services (GSSE) as a share of TSE.

**Percentage TSE (%TSE):** TSE as a share of GDP.

323. Two relative indicators of support are derived from absolute values of GSSE and TSE. The %GSSE indicates the importance of support to general services within total support. It is calculated as the percent share of the TSE:

\[
\%	ext{GSSE}_C = \frac{\text{GSSE}_C}{\text{TSE}_C} \times 100
\]  

[8.4]

324. The %TSE indicates the level of total support to agriculture relative to a country’s gross domestic product (GDP). The %TSE is found as a percent share of the value of GDP:

\[
\%	ext{TSE}_C = \frac{\text{TSE}_C}{\text{GDP}_C} \times 100
\]  

[8.5]

325. Table 8.3 presents the results of these calculations. The %GSSE is estimated at 15% while the %TSE is estimated at 1.5%.

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Description</th>
<th>Units</th>
<th>Source/equation</th>
</tr>
</thead>
<tbody>
<tr>
<td>GSSE</td>
<td>General Services Support Estimate</td>
<td>$ million</td>
<td>140</td>
</tr>
<tr>
<td>TSE</td>
<td>Total Support Estimate</td>
<td>$ million</td>
<td>908</td>
</tr>
<tr>
<td>%GSSE</td>
<td>Percentage General Services Support Estimate</td>
<td>%</td>
<td>15%</td>
</tr>
<tr>
<td>GDP</td>
<td>Gross Domestic Product</td>
<td>$ million</td>
<td>60,500</td>
</tr>
<tr>
<td>%TSE</td>
<td>Percentage Total Support Estimate</td>
<td>%</td>
<td>1.50%</td>
</tr>
</tbody>
</table>
CHAPTER 9.

CALCULATING INDICATORS OF SUPPORT FOR THE OECD AS A WHOLE

326. This chapter explains the procedure for calculating indicators of support for the OECD as a whole through the aggregation of support indicators for individual OECD countries. There are two steps that must be followed. First, monetary transfers and values of production are converted from national currencies into a common currency. Once this is done, two methods are used to aggregate the country values together in order to validate the results. Once absolute indicators have been estimated at the OECD level, the relative indicators can be derived.

9.1. Conversion into a common currency

327. To obtain OECD total support indicators, the value of transfers and production in national currencies must be converted into a common currency. The choice of the common currency has an important impact on the results in terms of how the absolute indicators: (a) compare between countries and (b) change from year to year. For this reason, OECD total support indicators are calculated in both US dollars and in Euros. However, the relative indicators are the same whatever common currency is chosen.

328. The conversion of national currency values into US dollar values is done as follows:

\[
MV_{C}^{USD} = \frac{MV_{C}^{NC}}{XR_{NC/USD}} \quad [9.1]
\]

where:

- \( MV_{C} \) – Monetary value, whether transfers or value of production, for country \( C \)
- \( USD \) – US dollars
- \( NC \) – National currency
- \( XR_{NC/USD} \) – exchange rate between local currency and USD

329. In case of the PSE, for example, it becomes:

\[
PSE_{C}^{USD} = \frac{PSE_{C}^{NC}}{XR_{NC/USD}} \quad [9.1a]
\]

330. The Euro values are derived as:

\[
MV_{C}^{EUR} = MV_{C}^{USD} \times XR_{EUR/USD} \quad [9.2]
\]

where:

- \( XR_{EUR/USD} \) – exchange rate between Euro and USD

331. Again, in the case of the PSE, it becomes:

\[
PSE_{C}^{EUR} = PSE_{C}^{USD} \times XR_{EUR/USD} \quad [9.2a]
\]
9.2. Aggregation to OECD totals

332. Once the values of transfers and production have been converted into US dollars and Euros, aggregation into OECD totals is carried out. There are two complementary methods to perform the aggregation for the PSE (Diagram 9.1).

333. The first aggregation uses the PSE categories (left-hand side); the second uses the four indicators of commodity specificity that are derived from the PSE (right hand side), i.e. the summing together the producer single commodity transfers (SCT), groups of commodities transfers (GCT), all commodities transfers (ACT) and other transfers to producers (OTP). The two methods act as a cross-check validating the result of the aggregation, i.e. the OECD total PSE.

334. Each of these two methods can be applied in two ways: (a) aggregating monetary transfers into the OECD total at the (sub)category level and then deriving the indicators (labelled “for database” in Diagram 9.1); and (b) re-calculating the absolute indicators at the national level, this time in a common currency, and aggregating them into an OECD total (labelled “for cross-checking” in Diagram 9.1). The former provides all the necessary details to break down the OECD total absolute indicators into their components, such as PSE categories or indicators of commodity specificity. For this reason it is used to derive the OECD total PSE and is explained in detail below for each of the two methods. In practice, the second possibility is also used to cross-check the results of both methods.

9.2.1. Aggregation based on PSE categories

335. In this method, the PSE sub-categories and categories are summed up for all countries. Using values expressed in US dollars as the example, this can be expressed as:

\[ PSE_{sub \text{Category}}^{USD}_{OECD} = \sum C_{PSE_{Category}}^{USD} \]  \[ \text{[9.3]} \]

336. For example, in the case of PSE category A, payments based on commodity outputs (CO) that becomes:

\[ CO^{USD}_{OECD} = MPS^{USD}_{OECD} + PO^{USD}_{OECD} = \sum MPS^{USD}_{C} + \sum PO^{USD}_{C} \]  \[ \text{[9.4]} \]

337. Once all country sub-categories and categories have been aggregated together, the OECD total PSE is calculated using the same formula as for individual countries:

\[ PSE_{USD}_{OECD} = \sum PSEC_{Category}^{USD}_{OECD} \]  \[ \text{[9.5]} \]

338. A similar procedure is followed for deriving the OECD total GSSE and CSE indicators, i.e. OECD values are first calculated for each of the various GSSE categories and for the various categories of transfers in the CSE, before being added together to derive the OECD total GSSE and CSE indicators.
Diagram 9.1. The procedure for calculating the OECD total PSE

aggregation over PSE categories

PSE CATEGORIES
OECD

A + B + C + D + E + F + G
OECD

aggregation

PSE CATEGORIES
by country

A + B + C + D + E + F + G
by country

aggregation

PSE
by country

COMMODITY SPECIFIC INDICATORS
by country

PSCT + GCT + ACT + OTPT
by country

aggregation

COMMODITY SPECIFIC INDICATORS
OECD

PSCT + GCT + ACT + OTPT
OECD

aggregation

OECD TOTAL PSE

121

for database

for cross-checking

for cross-checking

for database
9.2.2. Aggregation based on degree of commodity specificity

339. In this method, the four indicators of commodity specificity are aggregated over countries. This method does not apply to GSSE and CSE. The procedure begins by calculating an OECD total producer SCT value for each of the standard MPS commodities as follows:

\[ \text{producerSCT}_{\text{USD,OECD}} = \sum \text{producerSCT}_{\text{USD,SMC,C}} \]  

\[ [9.6] \]

where: SMC – standard MPS commodity

340. An OECD total producer SCT for Other Commodities (producer SCT_{OC}) is also calculated by a similar process:

\[ \text{producerSCT}_{\text{USD,OC,OECD}} = \sum \text{producerSCT}_{\text{USD,OC,C}} \]  

\[ [9.7] \]

341. From 9.6 and 9.7, the OECD total producer SCT is:

\[ \text{producerSCT}_{\text{USD,OECD}} = \sum \text{producerSCT}_{\text{USD,SMC,OECD}} + \text{producerSCT}_{\text{USD,OC,OECD}} \]  

\[ [9.8] \]

342. The OECD total GCT, ACT and OTP indicators are similarly calculated:

\[ \text{GCT}_{\text{USD,OECD}} = \sum \text{GCT}_{\text{USD,C}} \]  

\[ [9.9] \]

\[ \text{ACT}_{\text{USD,OECD}} = \sum \text{ACT}_{\text{USD,C}} \]  

\[ [9.10] \]

\[ \text{OTP}_{\text{USD,OECD}} = \sum \text{OTP}_{\text{USD,C}} \]  

\[ [9.11] \]

343. Once all four indicators of commodity specificity are calculated, they can be summed to an OECD total PSE as follows:

\[ \text{PSE}_{\text{USD,OECD}} = \text{producerSCT}_{\text{USD,OECD}} + \text{GCT}_{\text{USD,OECD}} + \text{ACT}_{\text{USD,OECD}} + \text{OTP}_{\text{USD,OECD}} \]  

\[ [9.12] \]

344. The final step is to compare and validate the results. If both methods result in the same OECD total PSE, the TSE for the OECD as a whole is calculated. Once the absolute indicators have been computed at the OECD level, the relative indicators are calculated, using the various formulas contained in Chapters 6, 7 and 8.
CHAPTER 10.

DATA AND INFORMATION REQUIREMENTS FOR CALCULATING THE INDICATORS

346. This chapter lists the data and information requirements for calculating the indicators of support, drawing on the methodology detailed in the previous chapters of Part II. Its purpose is to assist those involved in calculating indicators, whether Secretariat staff, Member country governments, independent researchers, etc., in gathering the necessary information which may need to be collected from a wide range of sources.

347. The indicators are calculated on an annual basis. The time scale (e.g. the number of years) over which the indicators are calculated will, accordingly, increase the quantity of information required.

10.1. Requirements for calculating price transfers

348. Information required on the domestic market:

- Value and volume of production information for individual commodities and total agriculture at the farm gate level.

- Producer (farm gate) prices, clearly indicating the unit that it is based on. For consistency within the transfer calculation either the value of production is found by multiplying quantity by price, or alternatively the value is divided by quantity to derive a producer price.

- In the case of cereals that are used for feed, separate production and prices are required for product used as feed and that used for food, e.g. the PP for wheat is often the weighted average price of wheat used for feed and wheat used for food.

- Consumption data is also required (QC). This can be obtained directly or as a result of adding the volume of production and imports and subtracting imports, ensuring that the same product weight basis is used.

- Quantities of product used for feed use in the livestock sector – divided into type of feed and the livestock commodities which use the feed.

349. Sources that can be used to obtain information related to marketing margins include:

- Estimations published by national authorities. However, such data are relatively rare as the information is often private.

- Estimations obtained on a regular but often ad hoc basis from national authorities, commodity boards, major cooperatives, industry organisations or major private processing companies. For example, OFIVAL in France, which estimated the processing costs of abattoirs based on survey data.
• Estimating the marketing margin as the difference between the producer price and an average wholesale price in the country considered. However, this type of estimation leads to very variable margins and it may be appropriate to use a moving average margin for several years. This is an option that is less preferable to the previous two.

• Using marketing margins available in other countries if no domestic information is available. This is the case for the milk reference price in importing countries, which is adjusted by subtracting the average margin in four main exporting countries (Annex 4.1). Several non-EU European countries use EU marketing margins for certain products.

350. **Trade data** includes:

- Values and volumes information for both exports (FOB) and imports (CIF) of agricultural commodities and products.
- Tariff schedule for the country – to understand the profile of tariffs imposed on imports.
- Export subsidy budgetary information.
- Exchange rate information – preferably on a monthly basis so that any seasonal calculations can be made.

10.2. **Requirements for calculating budgetary and other transfers**

351. Data on budgetary transfers related to the implementation of agricultural policies is based on official budgetary information on the execution of national budgets and reports by relevant agencies. The majority of this information is publicly available on the internet sites of the ministries of finance, agriculture and central banks of the countries concerned. Administrative databases which provide detailed information on current expenditures by programmes also exist within the ministries, often on a monthly basis. These help to adequate allocation of payments to calendar years. This information, however, is not publicly available.

352. Care should be exercised when budgetary information is compiled from several sources. Some sub-national expenditures may be reported both independently and as part of the expenditures made at higher administrative levels. Another case warranting caution in order to avoid double counting is where data on the budgetary outlays is compiled through combination of sources reporting the public spending by agencies and by specific programmes/activities. It is generally preferable to use a single source of budgetary information, however, this does not often provide sufficient detail on the budgetary spending, thus making it necessary to use several sources. It is therefore important to understand the composition of the budgetary data reported in various sources used. Specific country sources on agricultural budgetary spending may be found in the country specific documentation available on OECD public website.

353. Estimation of support based on the revenue foregone demands recourse to official documents describing the relevant mechanisms. For example, to estimate transfers related to preferential lending, normative documents are required describing the conditions of lending, including time terms of loans, repayment schedules and interest rates applied. In the case of debt rescheduling, all relevant government decisions outlining the conditions and schedules for repayments should be used. Information on preferential interest rates is usually available from the Ministry of Agriculture and banks involved in preferential lending. Information on market (reference) interest rates is usually published by the central banks. Ministries and agencies dealing with macro-economic issues typically provide various price and financial data.
PART III

INTERPRETING AND USING THE INDICATORS

FOR POLICY ANALYSIS
CHAPTER 11.
INTERPRETING THE INDICATORS

354. The indicators can be used to assess both the level and the composition of support that arise from policies supporting agriculture.\(^{21}\) The level of producer support and its composition is the information most commonly utilised. This chapter shows how the indicators can be used to interpret developments in the level of producer support, how the composition of producer support can be shown in terms of the categories (and sub-categories) in which policies are classified and the labels attached to these policies, including the degree of commodity specificity. The level and composition of support to the agricultural sector as a whole can be accessed through the TSE.

11.1. Interpreting the level of support

- Percentage indicators such as the %PSE, and ratios, such as producer NAC and producer NPC are preferred over monetary indicators to interpret the level of support, particularly when comparing changes over time and between countries.
- The %PSE indicates the extent to which transfers increase gross farm receipts.
- The contribution analysis helps explain the annual changes in producer support by identifying the source of changes in the various components.

11.1.1. Level of producer support – national (aggregate) level

355. There are three main indicators used to show the level of support provided to individual agricultural producers at the national (aggregate) level: %PSE, producer NAC, and producer NPC. These indicators show, in aggregate, the importance of agricultural support relative to receipts or border prices. Such relative indicators are generally used in preference to the absolute indicators as they are not affected by the size and the structure of the agricultural sector as a whole, the relative importance of commodities within the sector, or the rate of inflation. The percentage and indicators and ratios allow greater comparability over time, across countries and within a country.

356. A %PSE of 20% means that the estimated total value of transfers to individual producers from consumers and taxpayers represents 20% of total gross farm receipts\(^{22}\). Alternatively, that 20% of gross farm receipts come from transfers due to policy measures supporting producers (Box 11.1). A %PSE of 0% indicates that the estimated aggregate value of transfers to individual producers from consumers and taxpayers represents 0% of total gross farm receipts.

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21. The most recent set of indicators found in the indicator database should be used to build a database series (www.oecd.org/agr/support). The current set of indicators is significantly different from those published in the late 1980s and early 1990s. To maintain consistency, the indicators have been recalculated back to 1986 whenever a significant change in methodology has occurred.

22. Recall that gross farm receipts is the value of production, including budgetary and other transfers provided to producers (i.e. VP + BOT).
taxpayers is zero. A %PSE cannot by definition be higher than 100%, at which level all farm receipts come from policy measures with no returns from the market.

357. A producer NAC of 1.2 indicates that the estimated aggregate value of transfers to individual producers from consumers and taxpayers in the country increases the gross farm receipts by 20% above what they would be if production is valued at border prices (market receipts). A producer NAC of 1 indicates that the estimated aggregate value of transfers to individual producers from consumers and taxpayers is zero. A producer NAC of 4 indicates that gross farm receipts are four times, or 300%, higher than if production is valued at border prices.

358. Together, the consumer and producer NPCs measure the level of domestic market protection; the former compares domestic market and border price, and the latter adds in the value of support provided through payments based on output. A producer NPC of 20% for a country indicates that domestic producer prices are on average 20% above border prices for the same commodities. A producer NPC of 1 indicates that prices received by producers are on average the same as border prices. A producer NPC of 4 indicates that farm gate prices are on average four times, or 300%, higher than border prices.

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**Box 11.1. Two common misunderstandings of the support indicators**

It is easy to conclude that farm incomes must increase by the amount of support provided, e.g. a %PSE of 20% means that farm income is 20% higher due to support policies. This is not the case because the PSE is a gross revenue based concept which does not take into account the additional costs, explicit or implicit, incurred by the producer to receive the support. In addition, some of the value of transfers made to support producers will be lost to inefficiencies generated by market distortions, higher expenditure on inputs, or increased cost of land and quotas.

The impact of policies on farm income can vary significantly and depends on the types of policies used to support agriculture, but it will always be lower than the increase in farm receipts as measured by the indicators. For example, OECD analysis shows that the transfer efficiency of MPS can be as low as 25%, meaning that only 25 cents of each additional dollar provided as MPS is actually retained by farmers as “income” while the rest is lost to added cost, inefficiency, or input suppliers.

A second misinterpretation is to suggest that aggregate producer receipts would decline by the PSE value if all agricultural policies were removed. This value would be equivalent to USD 276 billion or Euros 220 billion in 2006 as measured by the 2007 *Agricultural Policies in OECD countries: Monitoring and Evaluation* report.

As emphasised throughout the manual, the PSE captures the policy effort made by governments to support farmers in current world market conditions. These conditions are themselves affected by current agricultural policies and would change following the removal of all agricultural policies. In particular, world prices would be expected to increase as a result of the elimination of policies, and hence domestic prices would not drop to the current level of border prices used to calculate the MPD. That is, some of the reduction in farm revenues caused by the loss of policy-induced transfers would be offset by higher international prices.

Even with given world prices, however, a policy change reducing the PSE by a given amount might well result in a decline of farm gross receipts by more than that given amount. For example, if price support is reduced, production may decline and hence gross receipts will shrink not only by the extent of price decline, but also by the extent of production decline. Again, it should be noted that the change in gross receipts might not be equated with the resulting change in farm income.

359. While the %PSE and producer NAC are complementary measures that always move in the same direction, the %PSE is relatively sensitive to changes in support levels when support is low relative to

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23. This does not necessarily mean that there are no transfers to individual producers from consumers and taxpayers within the country. It could be that transfers to producers through support policies are offset by transfers from producers that result from policies which implicitly tax producers.

24. As for the %PSE and producer NAC, a producer NPC of 1 for a country does not necessarily mean that all producers are receiving prices equivalent to border prices. It could be that producer prices for some commodities are higher than border prices, while they are lower for others.

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receipts, whereas the producer NAC is relatively sensitive to changes in market receipts when support is high. In order to understand changes in policy support over a broad range of support levels, both measures should be considered.

360. The %PSE is the share of the PSE in gross farm receipts, including support. When the PSE is large relative to market receipts, changes in the PSE will move the %PSE by a relatively small amount as the change in PSE impacts both the numerator and denominator of the ratio that defines the %PSE. As a result, the %PSE is relatively insensitive to PSE changes when the PSE is significantly larger than market receipts. For example, a %PSE value of 75% indicates a situation where the PSE is three times the level of market receipts. To reduce the %PSE from 75% to 66%, nine percentage points, either the PSE has to be reduced by half, or market receipts must increase by 50%.

361. The producer NAC is the extent to which receipts come from the marketplace and so measures the ratio of total receipts to market receipts. When the PSE is large relative to market receipts, changes in the PSE will affect the producer NAC approximately linearly, but changes in market receipts can affect the producer NAC asymptotically. For example, for the same situation described above where the PSE is three times the level of market receipts (%PSE=75%), the producer NAC has a value of 4, reflecting a situation where total receipts are four times market receipts. Increasing market receipts by 50% would reduce the producer NAC to 3, a reduction of 100 percentage points and 25% of the value of the indicator.

362. Table 11.1 and Figure 11.1 illustrate how the changes in the level of support to producers over time can be shown for a country (Box 11.2).

<table>
<thead>
<tr>
<th>Table 11.1. Indicators of producer support (example)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
<tr>
<td><img src="https://example.com/table.png" alt="Table" /></td>
</tr>
</tbody>
</table>

363. The indicators show that while the aggregate value of transfers to producers (PSE) in national currency has increased, the level of producer support, as a share of gross farm receipts (%PSE), has fallen from 40% in 1986-88 to 20% in 2004-06 – a decline of one-half. In 1986-88 transfers arising from support policies increased farm receipts by 67% above what they would have if production was valued at border prices. By 2004-06, farm receipts were only 25% higher due to support policies. The producer NPC indicates that prices received by producers were on average 40% higher than border prices in 1986-88. By 2004-06, the gap had fallen by 75%, so that prices received by producers are now on average only 10% higher than border prices.
Two methods are used to show changes in both the level and composition of support over time. These are done in either tabular or graphical form. The first method is to simply show an annual series of indicators over an extended time period. Viewing developments over the long term allows both general trends and year-to-year fluctuations to be observed.

The second method involves comparing three-year averages and the selection of an appropriate base period from which to reference changes. A three-year average reduces some of the year-to-year variability in support levels that arise due to fluctuations in world prices, exchange rates, etc. For OECD countries generally the reference period is 1986-88; a period of relatively high support, the WTO Uruguay Round base period for domestic support reduction commitments for developed countries; and predates most of the substantial agricultural reforms that have taken place. Consequently, in presenting the results in the annual Agricultural Policies in OECD Countries in tabular form, a column with the indicator values for the 1986-88 period is included alongside the most recent three year period. In graphical form it shows two columns or bars, one representing 1986-88 and the other the most recent period.

For other countries a different base periods may be more appropriate. For example, for monitored non-OECD countries such as Brazil, China, Russia, South Africa and Ukraine, the period 1991-93 is considered to be a more appropriate benchmark given the radical political and economic changes that took place in these countries in the late 1980s – early 1990s. It is also sometimes more appropriate to compare with the 1991-93 period in Mexico given the negative support levels that existed in the mid-1980s when farmers were effectively “taxed” by government policies.

### 11.1.2. Level of producer support – commodity level

The previous two sub-sections examine indicators of producer support at the country level. There are two indicators of the level of support which are calculated at the individual commodity level: %SCT and producer NPC. The %SCT measures the extent to which production of individual commodities is supported by policies. Comparing %SCT values across a range of commodities provides an indication as to which commodities are being supported and which ones are not. Figure 11.2 shows how the results can be presented for a country, showing changes in the %SCT from a base period. It can be quite clearly seen that the reduction in transfers to a single commodity has not been uniform across commodities compared with 1986-88.
Figure 11.2. Producer %SCT by commodity (example)

365. A producer NPC can also be calculated at the individual commodity level. As discussed above, the producer NPC shows the level of domestic market protection by comparing domestic prices to border prices. The reduction in the level of price support is shown by the producer NPC for each commodity. A producer NPC of 20% indicates that domestic prices are on average 20% above border prices. Again, these can be graphed for each commodity (Figure 11.3).
11.1.2 Level of producer support – contribution analysis

While percentage and ratio indicators can provide a good picture of the level of support provided to producers and how the level of support has changed over time, they do not offer any explanation as to why the changes have occurred. In-depth policy analysis requires some examination as to what has caused the change in support levels.

Changes in support levels may be due to several factors, the most obvious being variations in domestic agricultural policies. However, changes in international conditions can also make an important contribution to measured fluctuations in PSE, even in the absence of changes in domestic agricultural policies. The variability of world market prices for agricultural commodities and changes in exchange rates are often the most important contributors to fluctuations in the market price support component of the PSE.

In looking at this issue it is useful to make the conceptual distinction between explicit and implicit components of agricultural support policies (Tangermann, 2005). The explicit component of policy is what results directly from policy parameters explicitly set by governments, such as the amount of budgetary payments made or the determination of a support price in domestic currency. The implicit component of policy arises when domestic policy settings do not adjust to market developments, such as change in the world market price. The key point here is that in the absence of the explicitly set domestic...
support price, the producer price would be aligned with the border price, and would therefore move up or down with changes in world market prices and exchange rates.

369. The **contribution analysis** helps interpret changes in the level of producer support from one year to another by mathematically isolating the impact of both the explicit and implicit components of agricultural support. It answers the question “what would the impact of a policy element if all other policies were held fixed, *ceteris paribus*?” For example, what is the contribution of exchange rate to the observed change in the reference price? The analysis can be conducted for a given country or for the OECD as a whole, and can include one, several or all commodities. This discussion focuses on individual countries and the OECD as a whole.

370. For individual countries, the contribution analysis is based on data expressed in national currency. To aggregate the PSE to an OECD level, a common currency must be chosen (section 9.1), leading to a systematic bias depending on the currency chosen.

371. To mitigate this bias, the contribution analysis calculates the annual % change in the OECD total PSE as an index of individual country PSE changes (in national currencies) weighted by the shares of the country PSEs in the OECD total PSE in the previous year. Similarly, the annual % change in the OECD total MPS is a weighted average of country MPS changes with weights being the shares of country MPS in the OECD total MPS in the previous year. An important feature of this weighting scheme is that countries (and commodities) are weighted according to their contribution to the total PSE (and MPS), rather than by their contribution to the value of production.

372. The elements of the **PSE contribution analysis** follow from the definition:

\[ PSE_C = MPS_C + BOT_C \]  \hspace{1cm} [11.1]

where: \( PSE_C \) – Producer Support Estimate for country \( C \),
\( MPS_C \) – Market Price Support for country \( C \),
\( BOT_C \) – Budgetary and other transfers to producers for country \( C \)

373. The % change in the PSE can be decomposed into contributions from MPS, and budgetary and other transfers to producers respectively:

\[ \%\Delta PSE'_C = \frac{PSE'_C - PSE'^{-1}_C}{PSE'^{-1}_C} \times 100 \]

\[ = \left( \frac{MPS'_C - MPS'^{-1}_C}{PSE'^{-1}_C} \times 100 \right) + \left( \frac{BOT'_C - BOT'^{-1}_C}{PSE'^{-1}_C} \times 100 \right) \]  \hspace{1cm} [11.2]

where: \( t \) – current period (year)
\( t-1 \) – previous period (year)

374. The first half of the equation is the contribution from MPS while the second half is the contribution from budgetary and other transfers to producers. The calculations can be done at the national (aggregate) level because all variables are expressed as monetary transfers.
375. The contribution from budgetary and other transfers can be further decomposed into the different categories of the PSE classification (based on output, input use, etc.) as follows:

\[
\% \Delta \text{BOT}_C^t = \frac{\text{BOT}_C^t - \text{BOTP}_C^{t-1}}{\text{PSE}_C^{t-1}} \times 100
\]

\[
= \left( \frac{\text{PO}_C^t - \text{PO}_C^{t-1}}{\text{PSE}_C^{t-1}} \times 100 \right) + \left( \frac{\text{PM}_C^t - \text{PM}_C^{t-1}}{\text{PSE}_C^{t-1}} \times 100 \right)
\]

where: \( \text{PO}_C \) – Payments based on output for country \( C \)

\( \text{PM}_C \) – Miscellaneous payments for country \( C \)

376. The contribution analysis for MPS is based on the sub-total MPS value for the set of MPS commodities only, i.e. it excludes the aggregate “non MPS commodity” (MPSXE) as no representative prices are available for this category (section 6.1.3). The methodology, similar to that described for the PSE above, utilises country level data expressed in national currencies. As certain variables such as price and quantity produced cannot be “added-up”, an index is created, using as weights the value of MPS in the previous period.

377. The elements of the MPS contribution analysis derive from the calculation of MPS as the level of production multiplied by a per unit MPS, measured as the difference between producer and border price of an agricultural commodity measured at the farm gate and adjusted for excess feed costs:

\[
\text{MPS}_i = \text{QP}_i \times \text{MPSu}_i
\]

\[
\text{MPSu}_i = \text{PP}_i - \text{RP}_i + \frac{\text{EFC}_i}{\text{QP}_i}
\]

where: \( \text{MPSu} \) – Per unit MPS

378. The calculations are done at the individual commodity level because quantities cannot be meaningfully aggregated, e.g. tonnes of wheat and tonnes of beef. At the individual commodity level, the formula is:

\[
\% \Delta \text{MPS}_i^t = \frac{\text{MPS}_i^t - \text{MPS}_i^{t-1}}{\text{MPS}_i^{t-1}} \times 100
\]

\[
= \left( \frac{\text{QP}_i^t - \text{QP}_i^{t-1}}{\text{abs(\text{MPS}_i^{t-1})}} \times \frac{\text{MPSu}_i^t + \text{MPSu}_i^{t-1}}{2} \times 100 \right) + \left( \frac{\text{MPSu}_i^t - \text{MPSu}_i^{t-1}}{\text{abs(\text{MPS}_i^{t-1})}} \times \frac{\text{QP}_i^t + \text{QP}_i^{t-1}}{2} \times 100 \right)
\]

where: \( i \) – individual commodity

\( \text{abs(MPS)} \) – absolute value of MPS

379. The first half of the equation calculates the contribution to the change in MPS from the change in quantity produced; the second half calculates the contribution from the change in MPSu. To ensure mathematical consistency in the rare instances where MPS is negative in the reference period, the absolute value of MPS\( ^{t-1} \) is applied in the denominator of the decomposition.
380. The resulting percent changes are then aggregated to a weighted average for all MPS commodities using as weights the previous year shares of individual commodity MPS in the sub-total MPS for MPS commodities. Using commodity MPS shares as weights gives more importance to commodities with higher MPS. An alternative weighting could be based on value of production, but this would not reflect the pattern of support which is the focus of this exercise. Expressed algebraically:

$$\%\Delta MPS_C^t = \sum_{i \in AMC} \left( \frac{MPS_{i,t-1}}{\sum_{i \in AMC} MPS_{i,t-1}} \times \%\Delta MPS_i \right)$$ \[11.7\]

381. The calculation may result in a very high % change in MPS for some countries. This is due to either: (a) a significant change in MPS, or (b) a modest change in MPS, but MPS in the base year is very small or close to zero. In the latter case the result needs to be interpreted with care. This potential shortcoming is also present in the calculations for PSE but is more likely to occur here because the MPS for some countries is very small or close to zero.

382. The % change in the reference price can be decomposed into the contribution of exchange rate changes and the reference price defined in US dollars:

$$RP_{i,LC}^t = XR \times RP_{i,USD}^t$$ \[11.8\]

where:

- $RP_{i,LC}^t$ – reference price in local currency
- $RP_{i,USD}^t$ – reference price in US dollars
- $XR$ – exchange rate between local currency and US dollars

383. This assumption is reasonable for countries where US dollars represent a high share of international transactions. For other countries, another currency such as the Euro would be more representative. Nevertheless, “arbitrarily” choosing the US dollar facilitates cross-country comparisons. At the commodity level, the formula is:

$$\%\Delta RP_i^t = \frac{RP_i^t - RP_i^{t-1}}{RP_i^{t-1}} \times 100$$

$$= \left( \frac{XR_i^t - XR_i^{t-1}}{RP_i^{t-1}} \times \frac{RP_{i,USD,j}^{t-1} + RP_{i,USD,j}^t}{2} \times 100 \right) + \left( \frac{RP_{i,USD,j}^t - RP_{i,USD,j}^{t-1}}{RP_i^{t-1}} \times \frac{XR_i^t - XR_i^{t-1}}{2} \times 100 \right)$$ \[11.9\]

where:

- $RP_i$ – reference price
- $RP_{i,USD}^t$ – reference price converted to US dollars
384. As in the decomposition for MPS in equation 11.8, the results can be aggregated to a weighted average for all MPS commodities using as weights the MPS of each commodity in the previous year. Expressed algebraically:

\[
\%\Delta R_P^{t' \rightarrow t}_C = \sum_{i \in AMC} \left( \frac{MPS_{j}^{t' \rightarrow t}}{\sum_{i \in AMC} MPS_{i}^{t' \rightarrow t}} \times \%\Delta R_P^{t'} \right) \tag{11.10}
\]

385. Chapter 2 of the *Agricultural Policies in OECD Countries: Monitoring and Evaluation* report (OECD, 2007) presents the results of this extrapolation.

### 11.1.4. Expressing the level of support in real terms

386. The PSE and TSE indicators, expressed in national currency, do not take inflation into account. Further, conversion of these indicators into USD or Euros and their aggregation via these rates may lead to very different findings regarding support trends, depending on whether the value of the dollar (or the euro) appreciates or depreciates. For the period between 1986-88 and 2000-02, the aggregate OECD PSE fell by 3% in USD, but rose by 16% in Euros, because the Euro depreciated against the US dollar at the end of the period. In years when the value of the dollar declines, aggregate PSEs expressed in dollars tend to rise, and fall if expressed in Euros.

387. In so far as TSEs and PSEs constitute transfers between farmers, taxpayers and consumers, it is appropriate to express these indicators in terms of purchasing power, *i.e.* in real terms. This is accomplished by deflating them by an index that accounts for inflation, such as the GDP price index, and aggregating them across the OECD area using purchasing power parities (PPPs) calculated according to the gross domestic product (GDP) of the various countries. Using this procedure, it is estimated that the PSE for the OECD area as a whole dropped in real terms by 27% between 1986-88 and 2000-02(OECD, 2003). The Secretariat does not undertake these calculations on an annual basis, but periodically calculates and publishes the results.
11.2. Interpreting the composition of support

- The composition of producer support can be shown in terms of PSE categories and sub-categories and labels, which focus on the implementation criteria of the policies.
- The composition of support to general services can be shown in terms of broad policy areas.
- The composition of total support to agriculture can be shown in terms of who pays and who receives the transfers arising from policies.

11.2.1. Why analyse the composition of support?

388. When the indicators were first developed by the OECD in the mid-1980s, the vast majority of support was provided through policies that created transfers to producers through higher market prices or payments based on output. This allowed the focus of attention to be on the total level of support provided. As policies in OECD countries have been reformed over time, the issue of the composition of support has become more important. Modern agricultural policy has increased in complexity, with the introduction of new policy objectives and new approaches to policy support undertaken to meet requirements imposed by multilateral commitments such as the WTO Uruguay Round commitments and Panel Decisions.

389. Policies intended to have a reduced impact on production decisions, while still supporting farm income or the farm sector as a whole, have become more important. Policies increasingly deliver transfers not on the basis of commodity production (whether past or present) or input use, but on other bases such as area, overall farm income or environmental criteria. Many policies now provide transfers on the basis of “current and past prices and production”, often with constraints imposed on the conditions under which farmers are eligible for payments. This requires making a better distinction between support to commodity production as such, or to inputs used to produce them, and support to the farm as an entity or the agricultural sector as a whole. These changes in policy implementation have led to a new focus on the composition of the PSE as a means of understanding the effects and the development of new tools and methods to analyse them (Chapter 12).

390. Policy developments in Switzerland illustrate this concern. The level of producer support in Switzerland, as measured by the %PSE, has fallen from 77% to 66% between 1986-88 and 2004-06 – seeming to indicate modest progress towards policy reform. However, over this period Switzerland has made significant changes to its agricultural support policies. While relatively high tariffs and tariff rate quotas remain in place, Switzerland has abolished all state guarantees for prices and sales. It has also reformed the way in which direct payments are provided to farmers, replacing most of the previous programmes with two main types of payments: General Direct Payments, mainly granted in the form of area and headage payments on condition that farmers comply with a set of environmental farm management practices; and Ecological Direct Payments, mainly granted to compensate farmers for undertaking additional environmental or animal welfare practices.

11.2.2. Composition of producer support – categories of expenditure

391. The composition of support is reflected in the PSE by the share of support that falls into each of the PSE categories or sub-categories (see section 3.3 for definitions of the seven PSE categories and various sub-categories). The PSE categories can be expressed as a share of the PSE, with the sum of the category shares equaling 100%. Alternatively they can be expressed as a share of gross farm receipts, summing to the %PSE. This latter approach has the advantage of showing both the level and composition of support together. Table 11.2 and Figure II.4 illustrate how the composition of support to producers can be shown for a country.
Table 11.2. Composition of PSE (example)

<table>
<thead>
<tr>
<th>PSE Categories</th>
<th>USD million</th>
<th>Share of PSE</th>
<th>Share of Gross Farm Receipts</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. Support based on commodity output</td>
<td>6 000</td>
<td>2 400</td>
<td>80%</td>
</tr>
<tr>
<td>B. Payments based on input use</td>
<td>750</td>
<td>400</td>
<td>10%</td>
</tr>
<tr>
<td>C. Payments based on current A/An/R/I, production required</td>
<td>750</td>
<td>2 800</td>
<td>10%</td>
</tr>
<tr>
<td>D. Payments based on non-current A/An/R/I, production required</td>
<td>0</td>
<td>0</td>
<td>0%</td>
</tr>
<tr>
<td>E. Payments based on non-current A/An/R/I, production not required</td>
<td>0</td>
<td>2 400</td>
<td>0%</td>
</tr>
<tr>
<td>F. Payments based on non-commodity criteria</td>
<td>0</td>
<td>0</td>
<td>0%</td>
</tr>
<tr>
<td>G. Miscellaneous</td>
<td>0</td>
<td>0</td>
<td>0%</td>
</tr>
<tr>
<td>Total</td>
<td>7 500</td>
<td>8 000</td>
<td>100%</td>
</tr>
</tbody>
</table>

392. Table 11.2 and Figure 11.4 show that while the level of producer support has fallen by half, significant improvements have also been made in shifting away from support based on commodity outputs, which is the most production distorting. In 1986-88, 80% of producer support arose from policies providing support based on commodity output (category A), representing 32% of gross farm receipts. By 2004-06, the importance of output based support had fallen considerably, comprising 30% of producer support and just 6% of gross farm receipts. On the other hand, payments based on current parameters (category C) have risen significantly, from 4% of gross farm receipts in 1986-88 to 7% in 2004-06. Payments based on non-current parameters and not requiring production (category E) have been introduced and now represent 30% of producer support, which is equivalent to 6% of gross farm receipts.
In a similar way to the PSE, the producer SCT indicator can be broken down into the various PSE categories. As this indicator is made up of a smaller number of categories, the usual breakdown is into three components at the sub-category level: MPS (sub-category A.1), Payments based on output (sub-category A.2), and Other SCT (sub-category C.1 and single commodity in B and D) – mostly payments based on area or animal numbers.

### 11.2.3. Composition of producer support – use of labels

When policies are classified in the various PSE categories, they are also labelled according to certain policy characteristics relating to the provision of support:

- with or without current commodity production limits (L)
- with variable or fixed payment rates (V/F)
- with or without input constraints (C)
- based on area, animal numbers, receipts or income (A/An/R/I)
- based on a single commodity, group of commodities or all commodities (SC/GC/AC)
- with or without commodity exceptions (E)

Full definitions of these labels can be found in sub-section 3.3.3. Labels increase the range of policy characteristics that can be used to describe a policy. They can be used to produce different aggregations of payments, emphasising a specific implementation criteria used in the policies applied. Again, these can be presented in either graphical or tabular form.
combination create subsets of subsets. For example, a table showing the share of support with production limits for the PSE as a whole and another table showing the share of support with production limits for the subset of support based on current area (another possible label) can be visually similar, even though they would contain very different numbers with a different interpretation.

11.2.4. Composition of producer support – degree of commodity specificity

397. Particular attention is required using the label indicating the degree of commodity specificity of policies – that is the share of Single Commodity Transfers (producer SCT), Group Commodity Transfers (GCT) and All Commodity Transfers (ACT) in the PSE. Like the other composition categories, these can be expressed as a share of PSE (adding to 100%) or as a share of gross farm receipts (adding to %PSE) and in tabular form. These can be shown in tabular or graphical form. Table 11.3 and Figure 11.5 illustrate how the composition of producer support based on the degree of commodity specificity can be shown for a country.

Table 11.3. Breakdown of PSE by degree of commodity specificity (example)

<table>
<thead>
<tr>
<th>Commodity Category</th>
<th>1986-88 average</th>
<th>2004-06 average</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>USD Million</td>
<td>Share of PSE</td>
</tr>
<tr>
<td>Producer Single Commodity Transfer (producer SCT)</td>
<td>7 200</td>
<td>96%</td>
</tr>
<tr>
<td>Group Commodity Transfer (GCT)</td>
<td>100</td>
<td>1%</td>
</tr>
<tr>
<td>All Commodity Transfer (ACT)</td>
<td>200</td>
<td>2%</td>
</tr>
<tr>
<td>Other transfers to producers (OTP)</td>
<td>0</td>
<td>0%</td>
</tr>
<tr>
<td>Producer Support Estimate</td>
<td>7 500</td>
<td>100%</td>
</tr>
</tbody>
</table>

Figure 11.5. PSE level and commodity specificity (example)
SCT made up 50% of the PSE in 2004-06, a reduction from 96% in 1986-88. GCT, where producers have the option to produce any one of a specified group of commodities as part of programme eligibility, made up 15% of the PSE in 2004-06 compared to 1% in 1986-88. Transfers provided under the headings ACT and OTP place no restriction on commodities that farmers choose to produce, the later also not requiring farmers to produce at all. Together these made up 35% of the PSE in 2004-06, up from 2% in 1986-88. The commodity specificity composition of producer support in the example shows a progression in policy support away from SCT, first towards GCT and then more recently towards OTP transfers.

11.2.5. Composition of producer support – other indicators

Changes in the composition of producer support can also be shown by comparing the producer NPC and the producer NAC. These indicators can be compared because they both use a very similar denominator, i.e. production valued at border prices, as opposed to the %PSE where the denominator includes the value of support. The distinction between them is in terms of the numerator: the producer NPC includes only transfers in category A – support based on output; the producer NAC includes all transfers in the PSE. Consequently if the share of category A in the PSE falls overtime then the producer NPC will fall at a faster rate than the producer NAC. This can be seen by observing the reduction in NPC and NAC in Figure 11.1 where the line representing NPC has a steeper decline than the NAC line.

Reductions in MPS are also shown by changes in the %CSE and consumer NAC. A negative %CSE is an indicator of the implicit tax on consumption (measured at the farm gate) resulting from policies which increase the price paid by consumers. The negative impact of these policies more than offsets the support received through transfers to consumers through subsidies.

11.2.6. Composition of support to general services

Like the PSE, the policies that are combined to calculate the GSSE are grouped into categories of expenditure (see section 3.4 for an explanation of the categories). The breakdown is made on the basis of policy area rather than implementation criteria. Table 11.4 illustrates how the composition of support to general services can be shown for a country.

<table>
<thead>
<tr>
<th>GSSE Category</th>
<th>1986-88 average</th>
<th>2004-06 average</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>USD Million</td>
<td>Share of GSSE</td>
</tr>
<tr>
<td>Public stockholding</td>
<td>400</td>
<td>50%</td>
</tr>
<tr>
<td>Marketing and promotion</td>
<td>50</td>
<td>6%</td>
</tr>
<tr>
<td>Infrastructure</td>
<td>120</td>
<td>15%</td>
</tr>
<tr>
<td>Research and development</td>
<td>140</td>
<td>18%</td>
</tr>
<tr>
<td>Agricultural schools</td>
<td>50</td>
<td>6%</td>
</tr>
<tr>
<td>Inspection services</td>
<td>40</td>
<td>5%</td>
</tr>
<tr>
<td>Miscellaneous</td>
<td>0</td>
<td>0%</td>
</tr>
<tr>
<td>TOTAL GSSE</td>
<td>800</td>
<td>100%</td>
</tr>
</tbody>
</table>

The example reflects the relative importance of the various GSSE categories across the OECD as a whole and how they have changed over time. For example, spending on public stockholding has fallen, reflecting a reduction in the budgetary costs of maintaining MPS to producers, or a move away from a
policy of food security/stocks. At the same time a higher share is being spent on marketing and promotion. A number of countries are increasing spending on Infrastructure to improve the efficiency of the sector in response to increased competition. Support for education and research and development has been fairly stable as a share of GSSE expenditure. The share of Inspection services is fairly low in most countries, but has generally increased, reflecting greater public policy focus on food safety and the rising costs of protecting sanitary and phyto-sanitary standards given the increase in trade.

11.2.7. Composition of total support to agriculture

403. There are two ways in which the composition of total support can be shown – the first shows to which economic agent the transfer is provided; the second shows from which economic agent the transfer originates, i.e. who is bearing the cost of the support policies (illustrated in Table 8.2).

404. In terms of beneficiaries, the TSE can be separated out into three components: the PSE, the GSSE, and transfers to consumers from taxpayers. The third component measures the value of transfers received by consumers and not transfers from consumers in terms of higher prices, i.e. it is not the CSE. Table 11.5 illustrates how the composition of total support can be broken down for a country.

Table 11.5. Composition of TSE by recipient of transfer (example)

<table>
<thead>
<tr>
<th></th>
<th>1986-88 average</th>
<th>2004-06 average</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>USD Million</td>
<td>Share of TSE</td>
</tr>
<tr>
<td>PSE</td>
<td>7 500</td>
<td>76.5%</td>
</tr>
<tr>
<td>GSSE</td>
<td>800</td>
<td>8.2%</td>
</tr>
<tr>
<td>Transfers to consumers</td>
<td>1 500</td>
<td>15.3%</td>
</tr>
<tr>
<td>from taxpayers</td>
<td></td>
<td></td>
</tr>
<tr>
<td>TSE</td>
<td>9 800</td>
<td>100%</td>
</tr>
</tbody>
</table>

405. In interpreting policy developments, the share of GSSE in total support is emphasised, defining this indicator as the %GSSE. The %GSSE shows the importance of transfers that are not received by individual farmers within overall support. GSSE transfers do not depend on any individual farmers’ decisions to produce goods or services, or use factors of production, and do not affect farm receipts directly. In the example given, it can be stated that support for general services provided to agriculture in increased from 8% of total support in 1986-88 to 20% in 2004-06.

406. In terms of the burden of support, the TSE can be separated into three components: transfers from consumers, transfers from taxpayers and budget revenues. The third component is negative, recognising that a part of the transfers from consumers are received by government in terms of tariff revenue, which offsets some of the taxpayer cost. Table 11.6 illustrates how this composition of total support can be shown for a country.
Table 11.6. Composition of TSE by source of transfer (example)

<table>
<thead>
<tr>
<th></th>
<th>1986-88 average</th>
<th>2004-06 average</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>USD Million</td>
<td>Share of TSE</td>
</tr>
<tr>
<td>Transfers from consumers</td>
<td>7 500</td>
<td>76.5%</td>
</tr>
<tr>
<td>Transfers from taxpayers</td>
<td>2 800</td>
<td>28.6%</td>
</tr>
<tr>
<td>Budget revenues</td>
<td>-500</td>
<td>-5.1%</td>
</tr>
<tr>
<td>TSE</td>
<td>9 800</td>
<td>100%</td>
</tr>
</tbody>
</table>

407. In most OECD countries, consumers have traditionally borne the largest share of the cost of total support. Policy reforms have almost always emphasised a desire to reduce the consumer cost of agricultural policies, and to offset the reduction in producer returns by increasing budgetary payments. This would be shown by a decrease in the value of transfers from consumers and an increase in transfers from taxpayers. As can be seen in Table 11.9, this is exactly what has happened in the example. The composition of total support reinforces the changes that are seen in the composition of producer support.
CHAPTER 12.
USING THE INDICATORS FOR POLICY MODELLING

408. This chapter describes how the Secretariat uses the indicators in policy simulation modelling. The main purpose of this chapter is to assist other modellers who are, or may be considering, using the support indicators in their models by informing them of Secretariat practice. Policy modelling is undertaken by the Secretariat as part of its work to move from analysing the policy effort, as shown by the indicators, to measuring and understanding the policy effect, how support policies impact on production, trade, etc. Policy simulations in a sector as complex as agriculture often require a variety of different models. Three different models are used by the Secretariat, and this chapter discusses the various modelling techniques as well as some of the main assumptions, limitations and results, of each.

12.1. Policy Evaluation Model (PEM)

- PEM is a partial equilibrium model that was specifically developed to simulate the impact of support on economic variables such as production, trade and welfare.
- Each PSE category (and some sub-categories) is modelled by price wedges in the output or input market in which they have first incidence of effect.
- Covers the major cereal and oilseeds crops, milk and beef production in six OECD countries/regions of which the European Union is one.

409. The main purpose of the Policy Evaluation Model (PEM) is to bridge the gap between the PSE information, which categorises and quantifies agricultural support, and the impacts of policies by providing an analytical instrument to measure the economic effects of support on production, trade, prices, income and welfare. The approach taken is to combine the PSE data with, at the aggregate level, basic information on production technology and assumptions about elasticities of supply and demand, based on an extensive literature review, in order to relate the level of different types of policy transfers as classified in the PSE to the economic effects of interest. The results can be presented in the form of indicators, such as a production impact ratio (discussed below) or as part of a complete policy scenario, as was done in the case of the study of the EU CAP reform (OECD 2004b).

410. The key advantage of the PEM approach is that it recognises that agricultural policies classified within each of the seven PSE categories based on implementation criteria have different initial incidences in the various factor (input) and output markets. By creating a model that can properly reflect these initial incidences, it captures the most economically significant differences in implementation that the PSE categories intend to highlight (Table 12.1). The outcome is a model that fits very well the sort of information contained in the PSE database.
Table 12.1. How different PSE categories may be represented in PEM

<table>
<thead>
<tr>
<th><strong>PSE classification</strong></th>
<th><strong>First incidence of support in price wedge between</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>A.1. Market price support (MPS)</td>
<td>Domestic (producer and consumer) and the world price</td>
</tr>
<tr>
<td>A.2. Payments based on output</td>
<td>Domestic producer and domestic consumer prices</td>
</tr>
<tr>
<td>B.1. Payments based on variable input use¹</td>
<td>Domestic supply price and demand price – not specific to any one commodity. Applies equally to all purchased inputs except fertiliser and hired labour and designed such that the rate of support for all inputs is equal.</td>
</tr>
<tr>
<td>C. Payments based on current A/An/R/I of a Specific commodity (C1), group of commodities (C2) or all commodities (C3), production required</td>
<td>Area – supply and demand functions for land used to produce the specific commodity (C1), group of commodities (C2) or all commodities in the model (C3)</td>
</tr>
<tr>
<td></td>
<td>Animal numbers – supply and demand price for cows (milk) or domestic producer and domestic consumer price (beef), either separately (C1) or simultaneously (C2)</td>
</tr>
<tr>
<td></td>
<td>Receipts – revenue and costs in the zero-profit condition of affected commodities (C1, C2 or C3) (not yet implemented)</td>
</tr>
<tr>
<td></td>
<td>Income – supply and demand price for farm-owned factors of production and land used to produce the affected commodities (C1, C2, or C3)²</td>
</tr>
<tr>
<td>D. Payments based on non-current A/An/R/I, production required</td>
<td>Demand and supply functions for land for all commodities eligible to receive the payment (based on commodity groupings label), calculated such that relative supply prices of land are not changed by the policy</td>
</tr>
<tr>
<td>E. Payments based on non-current A/An/R/I, production not required</td>
<td>Demand and supply functions for land for all commodities eligible to receive the payment (based on production exceptions label), calculated such that relative supply prices of land are not changed by the policy³</td>
</tr>
<tr>
<td>F. Payments based on non-commodity criteria</td>
<td>Not currently modelled</td>
</tr>
<tr>
<td>G. Miscellaneous payments</td>
<td>Not currently modelled</td>
</tr>
</tbody>
</table>

¹. PSE sub-categories B.2 Payments based on fixed capital formation and B.3 Payments based on-farm services are not included in the model. These are very heterogeneous groups whose effects are not straightforward and cannot be represented in a generic way.

². These factors are assumed to provide the economic returns to the farmers who own them (though some land may be rented), and so represent the only sources of farm income in the model, measured as producer surplus in these factor markets.

³. Payment exceptions exist in many cases, for example where land receiving a payment based on a historical use may not be used to produce fruit or vegetables.

411. PEM provides a stylised representation of production, consumption, and trade of aggregates of major cereal and oilseeds crops, milk, and beef production in six OECD countries or regions: Canada, the European Union²⁵, Japan, Mexico, Switzerland, and the United States. The commodity modules of the

²⁵. The EU-25 is treated as a single region in PEM. Work is underway to add the 12 new member countries of the EU as well as Korea.
PEM model were all developed according to a common structure, with some specifics added to deal with dairy quota and pricing systems where they exist. Policy experiments are carried out using a structure where these individual modules are linked together through world price and trade effects.

412. Commodity supply is represented through a system of factor demand and factor supply equations. Excepting the rest of world module, where supply functions are directly specified, there are equations representing demand and supply responses for at least four categories of inputs used to produce these commodities in the studied countries. The factor demand equations reflect the usual assumptions of profit maximisation constrained by the production relationship. Thus, the commodity supply for the six OECD countries or regions are embedded in the equations that determine equilibria in these input markets. Supply response corresponding to a medium term adjustment horizon of around five years is reflected in the values assumed for the price elasticities of factor supplies and the parameters measuring the substitutability of factors in production as well as the factor shares.

413. No factor is assumed to be completely fixed in production, but land and other farm-owned factors are assumed to be relatively more fixed (have lower price elasticities of supply) than the purchased factors. Likewise, no factor is assumed freely mobile, but purchased inputs are assumed relatively more mobile (have higher price elasticities of supply) than the farm-owned factors.

414. While the magnitude of the effects varies by country, PEM shows a certain consistency in the ranking of the potential economic effects of policies in different PSE categories. Using MPS as a basis of comparison (where 1 equals the impact of MPS), payments based on input use (IS) or output (OU) are generally more distorting of production while payments based on area (AP), animal numbers (AA) or income (FI) are less so. Payments based on non-current production (NCP) are the least distorting (Figure 12.1). This pattern is consistent for relative effects on trade and prices, and inversely so for effects on farm income (Figure 12.2).

Figure 12.1. Relative policy impacts on domestic production

Source: OECD PEM model.
Since the model is designed to be as agnostic as possible in terms of its structure (using a simple Constant Elasticity of Substitution production function and basic supply and demand functions), the values for the elasticities chosen are the main drivers of these results. This begs the question of how accurate are the choices made for elasticity parameters, and how misleading is the model if the wrong parameter values are used. The approach taken to answering these questions has been to use a Monte-Carlo method to systematically vary these estimates and observe the resulting changes in model results. This identifies both the robustness of the model to parameter choices, and the relative importance of different parameter types in determining the results. This approach produces graphs which show the possible range of impact ratios (as compared with MPS) for each policy (Figure 12.3). A smaller overlap in the probability distributions of each policy’s impact ratio indicates a greater level of robustness of the model.
These results indicate that in the case of the United States, the effects of input support and historical entitlements are all very likely different from each other, while the effects of payments based on area or farm income or animal numbers could conceivably be the same.

12.2. GTAPEM

- GTAPEM is a general equilibrium model that is based on GTAP and incorporates key features of PEM, notably the more complete representation of agricultural land markets.
- Market price support estimates are not included in GTAPEM as they are already included through tariffs, export subsidies, etc.
- PSE payments are incorporated into the GTAP model by the Secretariat who reclassifies them into four GTAP categories.

GTAPEM is based on a modified version of the Global Trade Analysis Project (GTAP) model that incorporates key features of PEM, hence the name which is a combination of the names of the parent models. Unlike PEM, which is a partial equilibrium model that focuses exclusively on the agricultural sector, GTAPEM is a general equilibrium model that contributes two key advantages: (a) coverage of all other sectors in the economy, including the backward and forward linkages between sectors through an input-output structure; and (b) global coverage of all regions in the world. These additional elements are necessary for a global evaluation of the impact of multilateral liberalization of agricultural policies, including trade measures.

Various refinements to the agricultural supply side have been made to the standard GTAP model formulation. First, the modelling of production technology has been significantly improved to: (a) include a new land allocation system developed in the most recent version of the PEM; and (b) allow substitution between farm-owned and purchased inputs. These modifications are crucial to fully exploit the information in the indicator database. Second, factors of production are segmented between agricultural and non-agricultural uses. To ensure consistency with PEM, the revised model has been validated by calculating the relative impact of various agricultural policies.

The segmentation of factor markets and the distinction between farm-owned and purchased inputs follow the approach taken by Hertel and Keeney (2003). The OECD’s specific contribution is the more complete representation of agricultural land markets. This is a necessary requirement to analyse agricultural policy reform where it involves a shift from commodity specific policies towards wider categories of commodities. This issue is at the heart of the debate on “decoupling”. Agricultural policies in some OECD countries contain instruments that are less targeted at specific products through output market interventions, but are instead based on the idea that farmers should receive direct income support with minimal impact on their production decisions. In practice, this is achieved through payments linked to land use or animal numbers.

Like PEM, GTAPEM uses the indicator database as the source of information on government payments in support of producers in OECD and selected non-OECD countries. However, the MPS component of the PSE is not needed because the GTAP database explicitly includes tariffs, tariff equivalents of quotas and TRQs, and export subsidies. Budgetary payments within the PSE are regrouped by the Secretariat into the GTAP database into the following four categories:

26. The starting point for GTAPEM was the TABLO code of GTAP model version 6.2, September 2003.
27. This information is incorporated in the GTAP version 6 database and is made available to a wide group of researchers throughout the world. Currently, the size of the world wide GTAP network is estimated at more...
Output payments
Intermediate input payments
Land-based payments
Capital-based payments

421. For each of these categories the GTAP (and the GTAPEM) model contains policy variables that can be altered in simulation experiments. In GTAPEM the payments are translated into price wedges that create a difference between the purchaser’s price and the seller’s price for the item in question. Except for output payments, the policy variables all affect factors of production.

422. In the GTAP database, the treatment of land and capital subsidies differs somewhat depending on whether the commodity is crop or animal based. For crop commodities, payments based on area planted and fixed input constraints are allocated to land based subsidies. For animal product commodities, payments based on animal numbers and fixed input constraints are allocated to capital-based subsidies.

423. Incorporating the PSE budgetary support data into the GTAP database leads to a practical problem of consistency that needs to be solved. Given the different sources of data, there is a slight discrepancy between the values of agricultural production recorded in GTAP and the values of production reported in the indicator database. Hence, simply using the budgetary support data from the PSE would result in incorrect levels of support expressed as a ratio of support to production values. Since the rate of support and its effects on the relative price system are the most important from an economic modelling perspective, the following approach has been taken to tally the two sources.

424. For each commodity, the aggregate rate of budgetary support is calculated by dividing the total value of payments by the value of production as published by OECD. The rate of budgetary support multiplied by the corresponding GTAP value of production (at market prices) gives the GTAP total value of payments. The value shares of output, input, land and capital-based payments are then used to allocate these payments to the corresponding tax wedges in GTAP.

425. The procedure described above also allocates payments to GTAP commodities, which was easily possible in the PSE classification system used up to 2007. The new classification system does not allow for a straightforward allocation of payments to individual commodities since it distinguishes single commodity transfers (about 10% of the total payments) from those allocated to groups of commodities. Future releases of the GTAP database will have to rely on the new PSE classification system and discussion is still underway to achieve a good match between the new PSE data and the needs of modellers.
12.3. Modelling environmental policies

- PEM can model some of the environmental effects of agricultural support policies but it is limited by spatial aggregation.
- A Stylised Agri-environmental Policy Impact Modelling (SAPIM) framework has been developed to simulate the environmental impacts of a broader range of policies at the farm-level with heterogeneous land quality.
- To successfully model agri-environmental policies that provide payments to farmers, additional information to that contained within the indicator database is required.

426. In addition to modelling the economic effects of policies on production, trade, income, etc., simulation models can also be used to capture the complex linkages between agricultural policies and their environmental effects. The OECD modelling toolkit provides two options for doing this.

427. PEM can be used to analyse the environmental effects of agricultural support policies, since it already contains several stylised PSE related policies and allows treatment of land use and input use (such as fertiliser) at a sectoral level. The effectiveness of PEM as a tool to carry out this kind of analysis is determined by the policy question addressed and by the ability to link environmental impact to commodities included in the model.

428. The main difficulty in carrying out analysis of environmental impacts with PEM is the spatial aggregation of the model. Both agricultural productivity and the site specificity of environmental effects, such as biodiversity, water pollution and soil erosion, show significant heterogeneity due to spatial variation in the natural resource base and natural conditions.

429. In this regard, farm-level models can provide an excellent basis for examining farmer’s input use and land allocation choices under heterogeneous land quality. Consequently, the Secretariat has developed a Stylised Agri-environmental Policy Impact Modelling (SAPIM) framework – a farm-level model that analyzes joint production of commodity and non-commodity outputs as well as negative externalities under heterogeneous land quality. The set of agricultural policies that can be analyzed is broader with SAPIM than with PEM, ranging from existing policy instruments such as crop area payments, environmental cross-compliance schemes and agri-environmental payments. It can also model the delivery mechanism for policies, such as for example whether a flat-rate payment is used or price discrimination is used by having farmers bid into a programme. The disadvantage of SAPIM relative to PEM is that being a farm-level model, price effects of policies are not taken into consideration endogenously.

430. The information on support measures contained within the indicator database is useful in determining the environmental impact of agricultural support policies. For example, in both PEM and SAPIM, an area payment will be associated to land as a factor of production, and may or may not be specified on the basis of commodity production on the land. A reduction in area payments will then have a different impact on the environment than would a reduction in market price support associated with prices paid to farmers for a specific commodity.

431. However, the indicator database in its current version does not lend itself to modelling agri-environmental policies. While these policies are characterized by an “input constraint” label, they can be classified under categories B through to F depending on the implementation criteria for disbursement. The input constraint may be linked to an environmental goal or not. Even if the modeller knows that a programme is agri-environmental, the input constraint label provides no information on the type of input being constrained and the level of constraint. Consequently, the analyst cannot distinguish between a policy limiting the stocking rate on pasture and one limiting fertiliser use. Furthermore, for modelling
purposes one would need to quantify the constraints to determine their environmental impact, which cannot be done.

432. In conclusion, information contained in the PSE can be used as a starting point to model the impact of agricultural policies on the environment, either at the sectoral level (PEM) or at the farm level (SAPIM). However, additional information on implementation details is necessary to model the impact of agri-environmental policies on the environment.
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