



# **Development of a Price Squeeze Model**

**User Manual**

**December 2020**



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# 1. Introduction

This user manual provides a set of instructions on how to open, operate and update the Price Squeeze Model (hereinafter, 'the PSM' or 'the model') commissioned to Axon Partners Group Consulting (hereinafter, 'Axon' or 'Axon Consulting') by the Hellenic Telecommunications & Post Commission (hereinafter, 'the EETT').

This document has been conceived for a consultation process and therefore all the contents are potentially subject to change based on the feedback received from stakeholders.

The primary aim of the PSM is to assess the economic replicability of the SMP operator's retail tariffs in markets 3a and 3b by a reference operator defined as per the methodology<sup>1</sup>.

This manual has been split among the following sections:

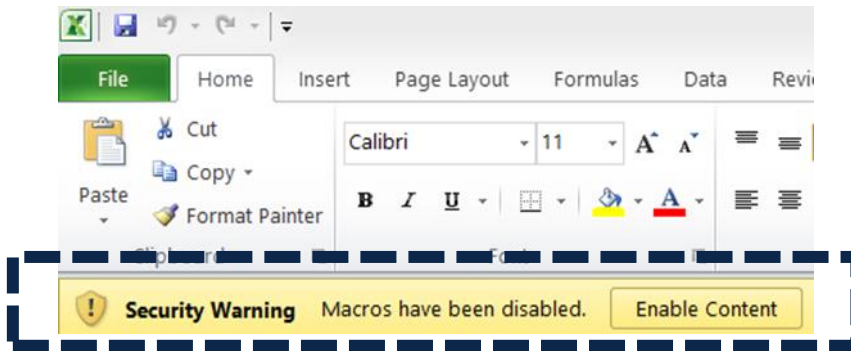
- ▶ **General overview of the model**, describing the structure and the worksheets of the PSM.
- ▶ **Understanding the control panel**, focused on the operation and implications of the Control Panel of the PSM, which is the main user interface where the main parameters and options are selected. Additionally, this worksheet contains the 'RUN' button to execute the model.
- ▶ **How to update the PSM's inputs**, providing indications and examples on the process that shall be followed to update the model's inputs.
- ▶ **How to**, describing the process to be followed to include and analyse new tariffs in the model.

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<sup>1</sup> "Margin Squeeze Test, Methodological Framework" EETT, Aug 2020, Source: <https://www.eett.gr/opencms/export/sites/default/admin/downloads/Consultations/telecoms/PCMethodFramework.pdf>

## 2. General overview of the model

The PSM is a Microsoft Excel<sup>2</sup> document that, when populated with the required inputs, performs all the relevant calculations to conclude about the economic replicability of the retail tariffs under assessment. In order to perform these calculations, the model makes use of Macros (embedded programs in Visual Basic) which need to be enabled when opening the model. In case the following warning message appears, please click “Enable Content”:



**Exhibit 2.1: Warning message that appears in MS Excel 2010 when the model is opened and Macros are not enabled [Source: Axon Consulting]**

All the algorithms and codes of the model are open and can be fully reviewed. Moreover, all the calculations are performed through the MS Excel formulas included in the different cells of the model.

Once the model is open the following screen will show up:

---

<sup>2</sup> The PSM is compatible with MS Excel 2010 onwards.

Price Squeeze Model			
Information			
<b>Title</b>	Price Squeeze Model		
<b>Version</b>	20.0		
<b>Status</b>	Final version		
<b>Author</b>	Axon Consulting		
<b>Email</b>	Axon Consulting		
	<a href="mailto:Dimitri.Kallinis@axonpartnersgroup.com">Dimitri Kallinis (dimitri.kallinis@axonpartnersgroup.com)</a>		
	<a href="mailto:Alfons.Oliver@axonpartnersgroup.com">Alfons Oliver (alfons.oliver@axonpartnersgroup.com)</a>		
	<a href="mailto:Fernando.Tornos@axonpartnersgroup.com">Fernando Tornos (fernando.tornos@axonpartnersgroup.com)</a>		
	<a href="mailto:Panagiotis.Trakas@axonpartnersgroup.com">Panagiotis Trakas (panagiotis.trakas@axonpartnersgroup.com)</a>		
Contents			
Sheet	Name	Description	Status
<a href="#">CONTENTS</a>	Price Squeeze Model	Provides high-level information about the PSM (i.e. version, status and points of contact). Provides a list and a brief description of the model's worksheets.	
<a href="#">CONTROL</a>	Control Panel	This worksheet includes the RUM button to perform the margin squeeze test calculations, the percentage of tariffs that do not pass the test, an interactive form that allows the user to see the main results of the test for a single tariff as well as a list of those tariffs not passing the test.	Finalised
<a href="#">MAP</a>	Model Map	Illustrates the relationship between the different blocks of worksheets of the PSM and includes shortcuts to access them.	Finalised
<a href="#">CHECKS</a>	Checks summary	Performs checks at different stages of the model to verify that it is behaving well and that no costs or revenues are "lost" in the process.	Finalised
<a href="#">0A PAR EXTERNAL SERVICES</a>	External services parameterisation	This worksheet lists all the relevant external services that are provided to a retail user and which conform the retail tariffs to be assessed within the PSM (e.g. PSTN line rental, FTTH 50 Mbps). An external service is defined as a product that a retail user may purchase, within a bundle or stand-alone, from its service provider.	Finalised
<a href="#">0B PAR INTERNAL SERVICES</a>	Internal services parameterisation	This worksheet lists all the relevant internal services that an OLO may use in order to provide the external services to its retail users (e.g. voice termination, backhaul IP conveyance). An internal service is defined as a product required by an OLO to provide the external services to its retail customers.	Finalised
<a href="#">0C PAR COST ITEMS</a>	Cost items parameterisation	This worksheet defines the parameterisation of the cost items considered throughout the model. A cost item refers to any billable service (recurring or one-off) that an OLO may have to pay for when providing an external service to its retail customers. These cost items may either take the shape of wholesale costs (i.e. payments to other operators), own network costs (i.e. investments in the deployment of own assets), retail costs or G&A.	Finalised
<a href="#">0D PAR NETWORK SCENARIOS</a>	Scenario Parameterisation	Definition of the different network scenarios/configurations that may be adopted by an OLO to provide the services to its customers.	Finalised

**Exhibit 2.2: Contents of the Price Squeeze Model [Source: Axon Consulting]**

The rows below "Contents" include a detailed overview of all the worksheets that comprise the PSM. Based on the starting number of the worksheets' names, these can be classified in separate blocks, as shown below:

- ▶ (No number): Support and control worksheets
- ▶ Block 0: Parameterisations
- ▶ Block 1: Tariffs and inputs
- ▶ Block 2: External services demand & revenues calculation
- ▶ Block 3: Internal services demand calculation
- ▶ Block 4: Calculation of own network and wholesale costs

- ▶ Block 5: Allocation of own network and wholesale costs to internal services
- ▶ Block 6: Calculation of retail and G&A costs
- ▶ Block 7: Calculation of unitary costs per retail tariffs
- ▶ Block 8: Annualisation of customer-dependent one-off costs
- ▶ Block 9: Results

The sub-sections below provide a brief description of the role and objectives of each of the worksheets that comprise the calculation blocks listed above.

Additionally, as it may be inferred from the previous exhibit, the model's worksheets have been labelled according to the following structure (except for the "Support and Control Worksheets" block):

- ▶ Block number and ordinal: It is composed of the number of the block (i.e. 0, 1, 2, ...) and the order in letter format (i.e. A, B ...).
- ▶ Type of worksheet indicators:
  - PAR: Definition of parameters
  - INP: Input worksheets
  - MAP: Mapping between items in two different dimensions
  - MAT: Matrix representing the relationship between two dimensions
  - CALC: Calculation worksheets
  - CONSOL: Consolidation of the results of previous calculations
  - OUT: Results worksheets
- ▶ Name of the worksheet.

As an example, the worksheet '1A INP RET TARIFFS' is the first (A) worksheet of the Block 1. It represents an input (INP) related with the retail tariffs (RET TARIFFS).

The table below describes the model's calculation blocks:

Block	Worksheet name	Description
<p><b>Support and control worksheets</b></p> <p><i>Worksheets within this block provide general information, support the calculation process and check if the execution has been performed properly</i></p>	<b>CONTENTS</b>	<ul style="list-style-type: none"> <li>▶ Provides high-level information about the PSM (i.e. version, status and points of contact).</li> <li>▶ Provides a list and a brief description of the model's worksheets.</li> </ul>
	<b>CONTROL</b>	<ul style="list-style-type: none"> <li>▶ This worksheet includes the RUN button to perform the margin squeeze test calculations, the percentage of tariffs that do not pass the test, an interactive form that allows the user to see the main results of the test for a single tariff as well as a list of those tariffs not passing the test.</li> </ul>
	<b>MAP</b>	<ul style="list-style-type: none"> <li>▶ Illustrates the relationship between the different blocks of worksheets of the PSM and includes shortcuts to access them.</li> </ul>
	<b>CHECKS</b>	<ul style="list-style-type: none"> <li>▶ Performs checks at different stages of the model to verify that it is behaving well and that no costs or revenues are "lost" in the process.</li> </ul>
<p><b>Block 0: Parameterisations</b></p> <p><i>These worksheets define the main variables (e.g. the names of the services, cost items)</i></p>	<b>OA PAR EXTERNAL SERVICES</b>	<ul style="list-style-type: none"> <li>▶ This worksheet lists all the relevant external services that are provided to a retail user and which conform the retail tariffs to be assessed within the PSM (e.g. PSTN line rental, FTTH 50 Mbps).</li> <li>▶ An external service is defined as a product that a retail user may purchase, within a bundle or stand-alone, from its service provider.</li> </ul>



Block	Worksheet name	Description
<p><i>that are used throughout the model</i></p>	<p><b>0B PAR INTERNAL SERVICES</b></p>	<ul style="list-style-type: none"> <li>▶ This worksheet lists all the relevant internal services that an OLO may use in order to provide the external services to its retail users (e.g. voice termination, backhaul IP conveyance).</li> <li>▶ An internal service is defined as a product required by an OLO to provide the external services to its retail customers.</li> </ul>
	<p><b>0C PAR COST ITEMS</b></p>	<ul style="list-style-type: none"> <li>▶ Parameterisation of the cost items considered throughout the model. A cost item refers to any billable service (recurring or one-off) that an OLO may have to pay for when providing an external service to its retail customers.</li> <li>▶ These cost items may either take the shape of wholesale costs (i.e. payments to other operators), own network costs (i.e. investments in the deployment of own assets), retail costs or G&amp;A.</li> </ul>
	<p><b>0D PAR NW SCENARIOS</b></p>	<ul style="list-style-type: none"> <li>▶ Definition of the different network scenarios/configurations that may be adopted by an OLO to provide the service to its end users.</li> </ul>
	<p><b>0E PAR GEOTYPES</b></p>	<ul style="list-style-type: none"> <li>▶ List of the geotypes considered within the model. A geotype is defined as a group of local exchange areas that share the same characteristics (e.g. in terms of collocation availability).</li> </ul>
<p><b>Block 1: Tariffs and inputs</b></p>	<p><b>1A INP RET TARIFFS</b></p>	<ul style="list-style-type: none"> <li>▶ Includes the retail tariffs subject to the margin squeeze test. Each of these retail tariffs has to be characterised in full within this worksheet (e.g. market price, number of lines included, voice traffic usage).</li> </ul>

Block	Worksheet name	Description
<p><i>These worksheets include the main inputs (e.g. retail tariffs, number of customers, wholesale rates) to be considered by the model when performing the margin squeeze test</i></p>	<p><b>1B INP MARKET</b></p>	<p>▶ Includes a set of key market inputs, such as the number of customers per access technology, and the nominal bandwidths per broadband speed, among others.</p>
	<p><b>1C INP WH TARIFFS</b></p>	<p>▶ Includes a complete list of the relevant wholesale services provided by the SMP operator (e.g. LLU, ARYS/V-ARYS, OKSYA) and their associated prices.</p>
	<p><b>1D INP NW</b></p>	<p>▶ This worksheet provides a number of network inputs (e.g. contention ratios, prices and useful lives of the assets) that are relevant in the calculation of any required own network costs.</p>
	<p><b>1E MAP COST CONSOL</b></p>	<p>▶ This worksheet maps the wholesale tariffs introduced in worksheet '1C INP WH TARIFFS' with the cost items parameterised in worksheet '0C PAR COST ITEMS'.</p>
	<p><b>1F INP RET COSTS</b></p>	<p>▶ Includes the retail costs per external service as well as additional supporting information to account for one-off expenses (e.g. customer life, migrations and disconnections rates).</p>
	<p><b>1G INP GEO</b></p>	<p>▶ Characterisation of the geotypes defined in the worksheet '0E PAR GEOTYPES' in terms the number of local exchanges they contain or the number of lines they serve, among others.</p>
	<p><b>1H INP COST RES AND SERV</b></p>	<p>▶ Disaggregation of the network costs of a given set of services per cost item, as extracted from EETT's bottom-up models.</p>
<p><b>Block 2: External services demand</b></p>	<p><b>2A CAL EXT SERV DEMAND</b></p>	<p>▶ This worksheet calculates the demand of external services originated by the customers of the different retail tariffs under assessment for the reference operator considered.</p>

Block	Worksheet name	Description
<b>&amp; revenues calculation</b>  <i>These worksheets calculate the demand of the external services and the revenues per retail tariff</i>	<b>2B CALC CUSTOMER LIFE</b>	▶ This worksheet calculates the effective customer lifetime for each retail tariff.
	<b>2C CALC RET REVENUES</b>	▶ This worksheet calculates the unitary revenues for each retail tariff.
<b>Block 3: Internal services demand calculation</b>  <i>These worksheets calculate the demand of the internal services</i>	<b>3A MAP ES2IS</b>	▶ Defines the usage of the internal services by each of the external services defined in the model.
	<b>3B MAT ES IS</b>	▶ Expresses the relationships built up between external and internal services in the previous worksheet in a matrix format.
	<b>3C CALC INT SERV DEMAND</b>	▶ Calculates the demand of internal services per external service based on the matrix implemented in worksheet '3B MAT ES IS' and the demand of the external services from worksheet '1B INP MARKET'.
	<b>3D CALC INT SERV DEM GEO</b>	▶ Allocates the demand of the internal services to the different geotypes considered in the PSM.
<b>Block 4: Calculation of own network and wholesale costs</b>  <i>These worksheets calculate the cost items required to</i>	<b>4A MAT OWN NW COSTS IS</b>	▶ Calculates the own network costs extracted from the bottom-up models per internal service.
	<b>4B CALC LOCAL ACCESS</b>	▶ Calculates the cost items required in the local access network for the provision of the relevant internal services under each of the scenarios defined in worksheet '0D PAR NW SCENARIOS'.

Block	Worksheet name	Description
<p><i>provide the service to the end users and calculate the total network and wholesale costs.</i></p>	<p><b>4C CALC BACKHAUL</b></p>	<ul style="list-style-type: none"> <li>▶ Calculates the cost items required in the backhaul network for the provision of the relevant internal services under each of the scenarios defined in worksheet 'OD PAR NW SCENARIOS'.</li> </ul>
	<p><b>4D CALC INTERCONNECTION</b></p>	<ul style="list-style-type: none"> <li>▶ Calculates the cost items required for interconnection to provide the relevant internal services under each of the scenarios defined in worksheet 'OD PAR NW SCENARIOS'.</li> </ul>
	<p><b>4E CONSOL SCEN COST</b></p>	<ul style="list-style-type: none"> <li>▶ Consolidates the costs of the cost items under each scenario for the access, backhaul and interconnection, based on the outcomes of the three previous worksheets.</li> </ul>
	<p><b>4F CALC SCEN SELECTION</b></p>	<ul style="list-style-type: none"> <li>▶ Identifies the most cost-effective (optimal) scenario for the provision of access, backhaul and transmission per geotype.</li> <li>▶ Defines the allocation factors of the cost items to internal services based on the applicability of such optimum scenarios.</li> </ul>
	<p><b>4G CALC OWN NW CORE</b></p>	<ul style="list-style-type: none"> <li>▶ Calculates the cost items required in the core network (i.e. above the Points of Presence).</li> </ul>
	<p><b>4H CALC CORE LINKS</b></p>	<ul style="list-style-type: none"> <li>▶ Calculates the cost items required in the backbone network.</li> </ul>
	<p><b>4I CONSOL CORE COSTS</b></p>	<ul style="list-style-type: none"> <li>▶ Consolidates the costs of the cost items for the core and backbone networks, based on the outcomes of the two previous worksheets.</li> </ul>
	<p><b>4J CONSOL NW AND WH COSTS</b></p>	<ul style="list-style-type: none"> <li>▶ Consolidates the own network and wholesale costs calculated in the previous worksheets.</li> </ul>

Block	Worksheet name	Description
<p><b>Block 5: Allocation of own network and wholesale costs to internal services</b></p> <p><i>These worksheets allocate the costs from the cost items to the internal services</i></p>	<p><b>5A MAP CI2IS</b></p>	<p>▶ Defines the usage of the cost items by each of the internal services defined in the model.</p>
	<p><b>5B MAT CI2IS</b></p>	<p>▶ Expresses the relationships built up between internal services and cost items in the previous worksheet in a matrix format.</p>
	<p><b>5C CALC IS NW &amp; WH COSTS</b></p>	<p>▶ Allocates the network and wholesale costs from the cost items to the internal services through the routing factors matrix calculated in the previous worksheet.</p>
<p><b>Block 6: Calculation of retail and G&amp;A costs</b></p> <p><i>These worksheets calculate the retail and G&amp;A costs per external service and retail tariff</i></p>	<p><b>6A CALC ES RET COSTS</b></p>	<p>▶ This worksheet calculates the unitary retail costs of the external services per cost item.</p>
	<p><b>6B CALC TARIFF GA &amp; SPECIF COST</b></p>	<p>▶ This worksheet calculates the G&amp;A costs as well as any applicable tariff-specific retail costs (e.g. associated to gifts and discounts).</p>
<p><b>Block 7: Calculation of unitary costs per retail tariffs</b></p> <p><i>These worksheets consolidate the own network, wholesale, retail and G&amp;A costs of the retail tariffs</i></p>	<p><b>7A MAT CI2ET</b></p>	<p>▶ This worksheet calculates the cost items total costs per external service.</p>
	<p><b>7B CONSOL RT UNIT COSTS</b></p>	<p>▶ This worksheet consolidates the unitary own network, wholesale, G&amp;A and retail costs per retail tariff.</p>

Block	Worksheet name	Description
<p><b>Block 8:</b> <b>Annualisation of customer-dependent one-off costs</b></p> <p><i>These worksheets are responsible for the annualisation of customer-related one-off costs over the effective customer lifetime</i></p>	<b>8A CALC COST ANNUALISATION</b>	<ul style="list-style-type: none"> <li>▶ Annualises the one-off costs per retail tariff based on the customer lifetime calculated in worksheet '2B CALC CUSTOMER LIFE'.</li> </ul>
<p><b>Block 9: Results</b></p> <p><i>These worksheets show the final results produce by the PSM</i></p>	<b>9A OUT RT</b>	<ul style="list-style-type: none"> <li>▶ Displays the revenues, costs and margins per retail tariff and shows whether they pass the margin squeeze test or not.</li> </ul>
	<b>9B OUT RT DETAILED</b>	<ul style="list-style-type: none"> <li>▶ Provides a detailed overview of the revenues and costs of the selected tariff plan.</li> </ul>

Table 2.1: Description of the model's worksheets [Source: Axon Consulting]

### 3. Understanding the control panel

The control panel represents the main interface between the user and the model. The exhibit below provides an overview of the control panel of the model:

Control panel

<- Worksheet description

This worksheet includes the RUN button to perform the margin squeeze test calculations, the percentage of tariffs that do not pass the test, an interactive form that allows the user to see the main results of the test for a single tariff as well as a list of those tariffs not passing the test.

---

Execution panel

RUN

Execution time

00:14

Last execution time

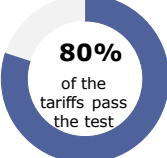
00:16

General check

OK

---

Summary of the results



80%

of the  
tariffs pass  
the test

Total number of tariffs assessed	5
Number of tariffs passing the test	4
% of tariffs passing the test	80%

All tariffs detail

Individual tariff detail

% of teleph. tariffs passing test	100%
% of ADSL tariffs passing the test	100%
% of VDSL tariffs passing the test	50%
% of FTTH tariffs passing the test	100%

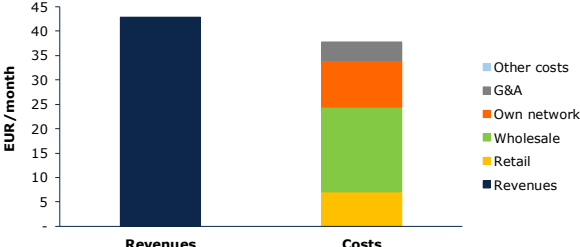
---

Results per tariff

Selected tariff

Tariff B

Parameter	Results (EUR/user/month)
Revenues	42,83
Costs	37,74
Retail	7,06
Wholesale	17,32
Own network	9,69
G&A	3,67
Other costs	-
Pass?	Yes



---

List of tariffs not passing the test

Tariffs not passing the test
Tariff C

**Exhibit 3.1: Illustrative snapshot of the control panel [Source: Axon Consulting]**

The control panel differentiates four main blocks, namely:

- ▶ Execution Panel
- ▶ Summary of the results
- ▶ Results per tariff
- ▶ List of tariffs not passing the test

Each of these blocks is described below.

### 3.1. Execution Panel

This panel includes the “RUN” button that is to be used by the user to execute the model. It is important to note that, if the user wants to assess the impact of changing an input into the model’s outcomes, he will always have to press the “RUN” button (i.e. the outputs are not automatically recalculated every time the user modifies a cell).

Additionally, this block informs the user about:

- ▶ The execution time. This cell will show the current execution time when the model is being run.
- ▶ The last execution time. This cell will show the time elapsed in the last execution of the model.
- ▶ The success of the execution. If all the calculations have been performed without errors, this cell will show a green “OK”, whereas if any errors have been registered it will show a red “REVISE 'CHECKS' SHEET”.

### 3.2. Summary of the results

This block will illustratively show the percentage of the tariffs under assessment that have passed the price squeeze test. Additionally, to more easily identify what may be the main source of any lack of replicability, this section will inform the user separately about the percentage of telephony, ADSL, VDSL and FTTH retail tariffs passing the test. Finally, it includes the following two buttons:

- ▶ All tariffs detail. This button will shortcut to worksheet ‘9A OUT RT’, where the detailed results of all the retail tariffs are presented.
- ▶ Individual tariff detail. This button will shortcut to worksheet ‘9B OUT RT DETAILED’, where the detailed results of a single retail tariff are presented.

### 3.3. Results per tariff

This section includes a drop-down list from which the user can select the retail tariff that he wants to review. Once selected, this block will provide the user with clear information in tabular and graphical formats about the revenues and costs (split between retail, wholesale, own network, G&A and other) of the tariff being reviewed.



### **3.4. List of tariffs not passing the test**

Finally, this last block of the control panel provides an exhaustive list of all the retail tariffs that have not passed the price squeeze test. These tariffs can also be found in worksheet '9A OUT RT' of the model.

## 4. How to update the PSM’s inputs

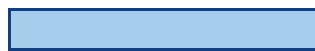
This section describes the process that should be followed by the user to update the inputs included in the PSM. The model distinguishes between two types of inputs depending on their expected update frequency:

- ▶ **Inputs to be updated every time the model is updated.** These refer, for instance, to the characterization of the retail tariffs. These inputs are coloured with a cream background (RGB code: R255-G250-B227), as illustrated below:



**Exhibit 4.1: Illustrative example of the format used for inputs that need to be frequently updated**  
[Source: Axon Consulting]

- ▶ **Inputs to be updated only once (or less) a year.** These refer, for instance, to the unit prices of the wholesale services. These inputs are coloured with a light blue background (RGB code: R164-G206-B236), as illustrated below:



**Exhibit 4.2: Illustrative example of the format used for inputs that need to be updated at most once a year** [Source: Axon Consulting]

Taking this colour code into consideration, the main categories of inputs to be potentially update by the user are:

- ▶ Retail tariffs
- ▶ Market data
- ▶ Prices of wholesale tariffs
- ▶ Network inputs
- ▶ Retail and G&A costs
- ▶ Geographical inputs
- ▶ Unitary costs per service

### 4.1. Retail tariffs

Retail tariffs are defined in the worksheet '1A INP RET TARIFFS' of the PSM. The structure of this worksheet has been designed with the objective of easing the introduction of all the

characteristics of a retail tariff. Additionally, it includes the same information, and in the same format, as the data requested to OTE in the worksheet '0B EX-POST FLAGSHIP PROD DETAIL' of the EETT's questionnaire.

In this worksheet, every retail tariff is presented in a single column, in which all its characteristics are introduced, as shown in the exhibit below:

**Tariff definition**

<- Worksheet description  
 This worksheet includes the retail tariffs subject to the margin squeeze test. Each of these retail tariffs has to be characterised in full within this worksheet (e.g. market price, number of lines included, voice traffic usage). This worksheet is divided in eleven steps:

Step 1: Tariff name - Provides the basic information and description of the tariff  
 Step 2: Customers info - Provides information on the tariff market price, the number of OTE's customers and the percentage of existing and new customers  
 Step 3: Bundle components - Provides information about the stand-alone retail activation and monthly fees for each component of a bundle tariff  
 Step 4: Tariff permanence - Includes the information of the permanence terms of the tariff  
 Step 5: Fixed access lines - Provides the information related to the average number of access lines included in a tariff  
 Step 6: Telephony services - Provides the information related to the for average minutes consumed per call type by the users in the tariff, as well as the pricing on additional minutes consumed  
 Step 7: Broadband services - Provides the information related to the average number of broadband lines included in the tariff  
 Step 8: Centrex package type - Provides the information regarding the Centrex package considered in the tariff  
 Step 9: Gifts - Provides information regarding the gifts and discounts applied to the tariff  
 Step 10: Additional costs - Provides the information on additional costs per month and tariff

The user can clean the current tariffs in the worksheet to introduce new data by using the "Clean current tariffs" button

**Step 1: Tariff name**

Tariff Name	1	2
	Tariff A	Tariff B

**Step 2: Customers info**

Last updated	dd/mm/yyyy		
Market price of the package	EUR/month	48,00	40,00
Percentage of Existing Customers (no new connection is needed)	%	-	-
Percentage of New Customers (non existing customers)	%	100%	100%
CHECK (Total should be 100%)		OK	OK

**Step 3: Bundle components**

Stand-alone retail activation fee

Fixed services (not including TV)	EUR	80,00	74,00
Mobile services (not including TV)	EUR		

**Exhibit 4.3: Overview of the worksheet '1A INP RET TARIFFS' [Source: Axon Consulting]**

Before populating the retail tariffs inputs, the user can clean the worksheet from existing tariff data by using the "Clean current tariffs" button shown in Exhibit 4.4.

**Tariff definition**

<- Worksheet description  
 This worksheet includes the retail tariffs subject to the margin squeeze test. Each of these retail tariffs has to be characterised in full within this worksheet (e.g. market price, number of lines included, voice traffic usage). This worksheet is divided in eleven steps:

Step 1: Tariff name - Provides the basic information and description of the tariff  
 Step 2: Customers info - Provides information on the tariff market price, the number of OTE's customers and the percentage of existing and new customers  
 Step 3: Bundle components - Provides information about the stand-alone retail activation and monthly fees for each component of a bundle tariff  
 Step 4: Tariff permanence - Includes the information of the permanence terms of the tariff  
 Step 5: Fixed access lines - Provides the information related to the average number of access lines included in a tariff  
 Step 6: Telephony services - Provides the information related to the for average minutes consumed per call type by the users in the tariff, as well as the pricing on additional minutes consumed  
 Step 7: Broadband services - Provides the information related to the average number of broadband lines included in the tariff  
 Step 8: Centrex package type - Provides the information regarding the Centrex package considered in the tariff  
 Step 9: Gifts - Provides information regarding the gifts and discounts applied to the tariff  
 Step 10: Additional costs - Provides the information on additional costs per month and tariff

The user can clean the current tariffs in the worksheet to introduce new data by using the "Clean current tariffs" button

**Clean current tariffs**

**Exhibit 4.4: Excerpt of the worksheet '1A INP RET TARIFFS' [Source: Axon Consulting]**

The process of populating the retail tariffs inputs is divided between different steps that are clearly differentiated in the model (e.g. references to "Step 1", "Step 2", "Step 3" from

the exhibit above). In particular, the steps to be followed to fully define a retail tariff to be assessed in the PSM are listed below:

- ▶ Step 1: Tariff name
- ▶ Step 2: Customers info
- ▶ Step 3: Bundle components
- ▶ Step 4: Tariff permanence
- ▶ Step 5: Fixed access lines
- ▶ Step 6: Telephony services
- ▶ Steps 7: Broadband services
- ▶ Step 8: Centrex package type
- ▶ Step 10: Additional costs

All steps to be followed when introducing a new retail tariff are described below.

#### 4.1.1 Step 1: Tariff name

The first step in the process of introducing a new tariff involves defining the name of the retail tariff as shown below:

**Step 1: Tariff name**

	1	2
Tariff Name	Tariff A	Tariff B

**Exhibit 4.5: Definition of the retail tariff name [Source: Axon Consulting]**

New retail tariffs should be added in empty spaces or otherwise a previously defined tariff will be overwritten.

#### 4.1.2 Step 2: Customers information

In the second step, the user is required to introduce the information related to the customers of the retail tariff defined in the first step. The fields of information to be filled in are illustrated below:

**Step 2: Customers info**

Last updated	dd/mm/yyyy		
Market price of the package	EUR/month	48,00	40,00
Percentage of Existing Customers (no new connection is needed)	%	-	-
Percentage of New Customers (non existing customers)	%	100%	100%
CHECK (Total should be 100%)		OK	OK

**Exhibit 4.6: Definition of the customer information for the retail tariff [Source: Axon Consulting]**

More specifically, the fields to be populated within this step are described below:

- ▶ **Date of last update:** Inputs the date when the tariff under review was last tested. This date is just for the user reference and has no impact on the model results.
- ▶ **Market price of the package:** Inputs the total monthly fee of tariff. In case it is a fixed/broadband service bundled with other services (i.e. mobile services), the associated fees should be recognized. The prices should be reported net of VAT.

It should be noted that the EETT considers the market price for the package to be the representative price within the customer's lifetime for a specific tariff. This customer lifetime typically includes a commitment period<sup>3</sup> for the tariff plus an additional period in which the customer continues with the tariff after the commitment period ends. For a commitment period of  $X$  months with a price of  $P_X$  EUR/month and a reasonable period of  $Y$  months with a price of  $P_Y$  EUR/month the market price of the package  $P_M$  is calculated according to the following formula:

$$P_M = (X * P_X + Y * P_Y) / (X + Y)$$

The EETT will in any case consider a reasonable time period of 2 months beyond the commitment for equivalent tariffs as an input, based on the available data on retail tariffs as well as any relevant market indicator. This reasonable time period beyond the commitment may be subject to change based on the evolution of the market.

- ▶ **Percentage of Existing Customers:** Inputs the percentage of customers that do not need a new access connection.
- ▶ **Percentage of New Customers:** Inputs the percentage of customer that require a new access connection.
- ▶ **CHECK:** Validates that the total percentage of the previous two inputs explained above sum a total of 100%. In case they do not match this figure, a review alert will be highlighted in the Control Panel general check cell.

### 4.1.3 Step 3: Bundle components

In this step, the user shall introduce the activation and monthly fees for each component of a bundled retail tariff, as show below.

---

<sup>3</sup> The commitment period refers to the period starting when the tariff is initially provided, during which the subscriber must remain within the undersigned tariff. In exchange, the customer typically benefits from discounted fees.

**Step 3: Bundle components**

**Stand-alone retail activation fee**

Fixed services (not including TV)	EUR	80,00	74,00
Mobile services (not including TV)	EUR		
TV services	EUR		
Other 1 (insurance fees, electricity, etc.)	EUR		
Other 2 (insurance fees, electricity, etc.)	EUR		
<b>Fixed service activation fee</b>	<b>EUR</b>	<b>80,00</b>	<b>74,00</b>

**Stand-alone retail monthly fee**

Fixed services (not including TV)	EUR/month	30,55	40,00
Mobile services (not including TV)	EUR/month		
TV services	EUR/month		
Other 1 (insurance fees, electricity, etc.)	EUR/month		
Other 2 (insurance fees, electricity, etc.)	EUR/month		
<b>Fixed service monthly fee</b>	<b>EUR/month</b>	<b>48,00</b>	<b>40,00</b>

**Exhibit 4.7: Definition of the activation and monthly fees of the different elements of a bundled retail tariff [Source: Axon Consulting]**

The prices should be reported for each product as if it was purchased separately from the rest and should be net of VAT. The reported prices for each product should be the ones that have been determined by considering the representative customer lifetime, as it has been explained for the ‘Market price of the package’ in section 4.1.2. One-off and monthly fees for the TV service should always be provided separately from the other fixed/mobile services.

**4.1.4 Step 4: Tariff permanence**

When there are any permanence requirements associated with a retail tariff, these should be defined in this step, as illustrated below:

**Step 4: Tariff permanence**

**Permanence terms**

Minimum Permanence	Months	20,00	24,00
Penalty if contract is cancelled before minimum permanence	EUR	150,00	10,00

**Exhibit 4.8: Tariff permanence inputs for a retail tariff [Source: Axon Consulting]**

In particular, the permanence period has to be expressed in “months” (not years), and any applicable penalties in “Euros”, net of VAT. If there is no minimum permanence for a retail tariff, these inputs can be left in blank.

**4.1.5 Step 5: Fixed access lines**

The fifth step of the tariff definition process relates to the introduction of the average number of lines per access technology included in the retail tariff plan being defined, as illustrated below:

**Step 5: Fixed access lines**

Average number of PSTN access lines included	PSTN Lines		1,00
Average number of ISDN access lines included	ISDN Lines		
Average number of naked ADSL lines included	Naked ADSL Lines		
Average number of naked VDSL lines included	Naked VDSL Lines		
Average number of FTTH lines included	FTTH Lines	1,00	

**Exhibit 4.9: Number of fixed access lines per retail tariff [Source: Axon Consulting]**

Although it should be expected that most retail tariff plans will have one single line (especially in residential tariffs), some tariffs may include more than one line. As a result, the average number of lines included in the tariff will have to be included in this table. This average does not need to be an integer and may include both PSTN and ISDN lines.

**4.1.6 Step 6: Telephony services**

Step 6 involves introducing the tariff data related to telephony services. In particular, the following inputs need to be introduced in this step:

- ▶ Volume of the minutes consumed within the tariff
- ▶ Volume of minutes consumed outside the tariff
- ▶ Average revenue per minute consumed outside the tariff

**Volume of the minutes consumed within the tariff**

The average consumption of voice traffic included in the tariff (i.e. for which the customer does not pay any extra amount) shall be introduced in the table below, according to the origin and destination of the voice call:

**Volume of the minutes consumed within the tariff (minutes/month)**

Note: All the minutes included in the tariff should be considered, regardless of the number of lines

Fixed to fixed	min/month	135,00	140,00
Fixed to mobile	min/month	8,00	12,00
Fixed to international	min/month	5,00	3,50
Fixed to IN	min/month		

**Exhibit 4.10: Volumes of minutes used within the tariff [Source: Axon Consulting]**

Typically, tariffs include, for example, “x” minutes/month to mobile, however the expected average consumption by customers amounts to “y”, being “y” less than “x”. The value of “y” shall be taken as an input.

**Volume of minutes consumed outside the tariff**

The data related to traffic consumed outside the tariff (for instance, if the user exceeds the voice traffic allowance included in the tariff) should be introduced within this section,

as shown below, and according to the same format/structure as described in the previous paragraph:

**Volume of minutes consumed outside the tariff (minutes/month)**

Note: All the minutes consumed outside the tariff should be included, regardless of the number of lines

Fixed to fixed	min/month		
Fixed to mobile	min/month	5,55	5,55
Fixed to international	min/month	2,00	1,50
Fixed to IN	min/month		

**Exhibit 4.11: Volumes of minutes used outside the tariff [Source: Axon Consulting]**

**Average revenue per minute consumed outside the tariff**

In the case of the minutes consumed outside the tariff, the consumer is going to be charged a fee for this traffic to be determined based on a price per quantity (pxq) approach. Therefore, in order to quantify these revenues, the prices applied to the traffic consumption outside the tariff shall be specified, in Euros/minute in the table below:

**Average revenue per minute consumed outside the tariff (EUR/min)**

Note: The average revenue per minute should be inputted (not the nominal tariff)

Fixed to fixed	EUR/min	0,11	0,11
Fixed to mobile	EUR/min	0,24	0,24
Fixed to international	EUR/min	0,50	0,50
Fixed to IN	EUR/min	0,14	0,14
<b>Revenue of minutes consumed outside the tariff</b>	<b>EUR/month</b>	<b>2,33</b>	<b>2,08</b>

**Exhibit 4.12: Average revenue per minute consumed outside the tariff [Source: Axon Consulting]**

**4.1.7 Steps 7: Broadband services**

This section describes the process to be followed to fill in Step 7. In this step, the following number of broadband lines (for instance, ADSL/VDSL/ADSL naked/VDSL naked/FTTH lines) of any given speed included in the tariff has to be introduced.

Although it should be expected that most retail tariff plans will have one single line (especially in residential tariffs), some tariffs may include more than one line. As a result, the average number of lines included in the tariff will have to be included. The exhibit below provides an overview of the inputs to be included within this table for the broadband lines:



**Step 7: Broadband services**

Average number of ADSL connections up to 24Mbps	ADSL Lines		
Average number of VDSL connections up to 30Mbps	VDSL Lines		
Average number of VDSL connections up to 50Mbps	VDSL Lines		
Average number of VDSL connections up to 100Mbps	VDSL Lines		1,00
Average number of VDSL connections up to 200Mbps	VDSL Lines		
Average number of ADSL naked connections up to 24Mbps	ADSL Lines		
Average number of VDSL naked connections up to 30Mbps	VDSL Lines		
Average number of VDSL naked connections up to 50Mbps	VDSL Lines		
Average number of VDSL naked connections up to 100Mbps	VDSL Lines		
Average number of VDSL naked connections up to 200Mbps	VDSL Lines		
Average number of FTTH lines included - 30 Mbps	FTTH Lines	1,00	
Average number of FTTH lines included - 50 Mbps	FTTH Lines		
Average number of FTTH lines included - 100 Mbps	FTTH Lines		
Average number of FTTH lines included - 200 Mbps	FTTH Lines		
Average number of FTTH lines included - 300 Mbps	FTTH Lines		
Average number of FTTH lines included - 500 Mbps	FTTH Lines		
Average number of FTTH lines included - 1000 Mbps	FTTH Lines		

**Exhibit 4.13: Number of average broadband lines [Source: Axon Consulting]****4.1.8 Step 8: Centrex package type**

Step 8 involves introducing the tariff data relative to Centrex services. In particular, the definition of the Centrex package acquired – Small, Medium or Large - is an input. A snapshot of how this information is introduced is shown in the following exhibit:

**Step 8: Centrex package type**

Small package	#	1,00		
Medium package	#		1,00	
Large package	#			1,00

**Exhibit 4.14: Retail tariff - Centrex - package type definition [Source: Axon Consulting]****4.1.9 Step 9: Gifts**

This step introduces the discounts as well as one-off gifts provided to the customer. The data regarding monthly discounts as well as one-off gifts has to be introduced within this section, as shown below:

**Step 9: Gifts**

# Months with discount per line	months	6,00	24,00
Discount per month per line	EUR/month	5,00	10,00
Total one-off gifts for the line	EUR	-	

**Exhibit 4.15: Gifts related to telephony services [Source: Axon Consulting]**

Particularly, the following information is to be included in each of these three fields:

- ▶ Number of months with discount: Number of months in which the user enjoys a discount in their monthly subscription.
- ▶ Discount per month: Amount of the monthly discount (in Euros/month) enjoyed by the user.

- ▶ **Total one-off gifts:** The one-off gift value represents the net cost of the gift from the operator point of view. This is, how much the operator has to pay for the gift minus the amount that the customer pays for it (if it pays at all). For instance, if a phone is given to the user, the price paid by the operator in Euros, net of VAT, must be entered.

#### 4.1.10 Step 10: Additional costs

This section covers any other additional costs that may be faced when providing a given retail tariff which could not be included in any of the previous steps. This may include, for instance, a specific installation fee.

These additional costs shall be introduced as Euros per month (i.e. already annualised if they are one-off) as illustrated in the exhibit below:

##### Step 10: Additional costs

Additional costs per month and tariff	EUR/month		
---------------------------------------	-----------	--	--

**Exhibit 4.16: Additional costs per month and tariff [Source: Axon Consulting]**

## 4.2. Market data

Market data is included in the worksheet '1B INP MARKET' of the model. The structure of the '1B INP MARKET' sheet has been designed with the purpose of facilitating the introduction of the market values. These values can be found in EETT sources (i.e. market analyses, internal studies etc.), as well as OTE's responses to the questionnaire submitted by the EETT.

The market inputs may be classified in the following categories:

- ▶ **Modelled operator:** it introduces the market share of the modelled operator, as well as the mark-ups to be applied over G&A and retail costs to resemble the inefficiencies of such reference operator against the SMP input data. Finally, it also inputs the Weighed Average Cost of Capital (WACC) to reflect the minimum margin to be obtained by the reference operator.
- ▶ **Demand:** it introduces the number of total customers in the market per access type (i.e. PSTN, ISDN, xDSL and FTTH) as well as per broadband lines per speed and type. This information should be available to the EETT from market analyses or internal studies.
- ▶ **Centrex:** it introduces the information on the average number of users per Centrex subscribed package. This information is extracted from the questionnaire submitted to OTE by the EETT, particularly in worksheet '3A CENTREX DATA'.
- ▶ **Bandwidth:** it introduces the actual average speed mapped to the nominal speeds of the retail services offered by OTE. This information can be found in worksheet '1B NETWORK DATA' of the questionnaire sent by the EETT to OTE.

The inputs of the above categories are presented in tables that include the following information:

- ▶ **Table title:** Above each table there is a title representing each of the above categories and a short description of the included market inputs (e.g. table MODELLED OPERATOR with description "Inputs of the modelled operator").
- ▶ **Description or relevant name:** For each market input there is a description which along with the table's title facilitates the mapping from the aforementioned data sources (EETT data, OTE questionnaire etc.) to the corresponding inputs in the model.
- ▶ **Units:** Each market input is described by the corresponding unit of measure (e.g. %, lines, bitrate etc.).

- ▶ **Value:** Each market input’s value should be updated by the user according to the market data available within the EETT, EKOS results and the questionnaire filled by OTE. These input fields have a light blue colour.
- ▶ **Variable:** Each market input is described by a variable for its later use in the model.
- ▶ **Source & Update Date:** In order to be able to track properly the updates in the model inputs, the tables include two fields for the source of the updated information (e.g. EETT market data, OTE questionnaire etc.) as well as the date corresponding to the information source (e.g. publication date of EKOS decision). Both fields should be updated by the user along with the update of the wholesale tariff’s value. These input fields have a light blue colour.
- ▶ **Comments:** The final field of the table may include additional, clarifying information that has been deemed necessary regarding the market inputs.

An illustrative example of the market input table format is presented in the following exhibit:

**MODELLED OPERATOR**  
Characterisation of the modelled operator

Description	Units	Value	Variable	Source	Update Date
Market share of the modelled operator	%	20,00%	<i>input.marketshare.modelledoperator</i>	Methodology	22/10/2020
Mark-up over retail costs to reflect the operator’s scale	#	1,42	<i>markup.modelled.op.retail</i>	Data from fixed operators	22/10/2020
Mark-up over G&A costs to reflect the operator’s scale	#	1,12	<i>markup.modelled.op.ga</i>	Data from fixed operators	22/10/2020
WACC	%	8,48%	<i>input.wacc</i>	EETT - NGA model WACC	22/10/2020

**Exhibit 4.17: Market input – Illustrative example for customer market data per access type [Source: Axon Consulting]**

### 4.3. Prices of wholesale tariffs

All information related to the wholesale services provided by OTE and their associated prices is to be found in worksheet ‘1C INP WH TARIFFS’ of the model.

The structure of this worksheet has been designed with the purpose of facilitating the introduction of the prices of the different wholesale tariffs imposed by the EETT. Additionally, this worksheet also includes some inputs that characterise the provision of the wholesale services.

This worksheet has been divided among the main types of wholesale services provided by OTE (e.g. WLR, number portability, LLU, V-ARYS, OKSYA). Each of these blocks includes the billable items and associated prices offered by OTE through its wholesale pricing list. These blocks are:

- ▶ Wholesale Line Rental (WLR) tariffs

- ▶ LLU and co-location tariffs
- ▶ Interconnection tariffs
- ▶ Number portability
- ▶ ARYS / V-ARYS tariffs
- ▶ VPU xDSL tariffs
- ▶ VPU FTTH tariffs
- ▶ OKSYA tariffs
- ▶ Ethernet tariffs

The exhibit below provides an overview of the common format that has been used to reproduce OTE's pricelists within this worksheet:

#### ARYS / V-ARYS TARIFFS

ARYS					
Description	Units	Value	Variable	Source	
ARYS - LE SUBSCRIPTION - 24 Mbps	EUR/month	2,45	<i>input.arys_LE.tariff.24Mb.subscription</i>	EETT decision 937/03	
ARYS - LE ACTIVATION - 24 Mbps	EUR	31,97	<i>input.arys_LE.tariff.24Mb.activation</i>	EETT decision 937/03	
ARYS - CAB SUBSCRIPTION - 24 Mbps	EUR/month	5,56	<i>input.arys_CAB.tariff.24Mb.subscription</i>	EKOS decision	
ARYS - CAB ACTIVATION - 24 Mbps	EUR	30,15	<i>input.arys_CAB.tariff.24Mb.activation</i>	EETT decision 937/03	

V-ARYS LE SUBSCRIPTION					
Description	Units	Value	Variable	Source	
30 Mbps	EUR/month	2,57	<i>input.varys_LE.tariff.30Mb.subscription</i>	EETT decision 937/03	
50 Mbps	EUR/month	2,87	<i>input.varys_LE.tariff.50Mb.subscription</i>	EETT decision 937/03	

**Exhibit 4.18: Illustrative example of the format used to reflect OTE's pricelists in the model**  
 [Source: Axon Consulting]

These tariffs are mapped to the corresponding cost items, which are consolidated in worksheet '1E INP MAP COST CONSOL'.

## 4.4. Network inputs

The key network inputs that are required to properly calculate the wholesale services required as well as to determine own network costs are defined in the worksheet '1D INP NW' of the model.

This worksheet includes different categories of network inputs, which are clearly structured in separate blocks, as described below:

- ▶ **Call statistics:** Includes voice statistics required for the costing of the voice traffic (e.g. average call duration). This information comes from worksheet '1B NETWORK DATA' of the questionnaire to be populated by OTE. Additionally, some of the inputs included in this block are either constants (e.g. number of Kbps per Mbps) or defined in the voice codec standards (e.g. voice bitrate) and are not subject to periodic updates.

- ▶ **Network parameters:** Includes information regarding LLU, collocation, MSAN, access equipment and optical cable related costs. The source for this information varies relying on the available data at each moment but is generally extracted from three sources:
  - Worksheet '1B NETWORK DATA' of the questionnaire sent to OTE
  - EKOS data
  - EETT's Bottom-Up NGA cost model

The specific sources of each parameter are indicated in the "Source" fields.

- ▶ **Useful lives:** Includes the useful lives of a set of network assets which are relevant for the calculation of own network costs (e.g. copper cable and optical fibre). This information is mainly extracted from the EETT's Bottom-Up NGA cost model, although the inputs for "Centrex platforms" come from worksheet '3A CENTREX DATA' of the questionnaire sent to OTE. The specific sources of each parameter are indicated in the "Source" fields.
- ▶ **Contention ratio:** It introduces the contention ratio (i.e. the potential maximum demand in terms of users over the actual bandwidth) of the retail services offered by OTE for each offered nominal speeds. This information is found in worksheet '1B NETWORK DATA' of the questionnaire sent by the EETT to OTE.
- ▶ **Centrex platforms costs:** it introduces information on Centrex platforms costs, which can be found in worksheet '3A CENTREX DATA' of the questionnaire sent by the EETT to OTE. The platforms information is aggregated by their applicability and their maximum number of users.
- ▶ **Mobile interconnection:** it introduces the termination rate to mobile lines, which can be found in EETT's decisions.
- ▶ **International connectivity:** it introduces prices and statistics regarding international connectivity costs, traffic and equipment. This information is found in worksheet '1B NETWORK DATA' of the questionnaire sent by the EETT to OTE, as well as extracted from the EETT's Bottom-Up models for NGA networks in terms of the necessary IP routers.

The above categories are presented with tables which have the same format as the tables in worksheet '1C INP WH TARIFFS' (see section 4.3).

Some of the listed inputs costs are mapped to the corresponding cost items consolidated in worksheet '1E INP MAP COST CONSOL', while other are used throughout the model for supporting calculations.

## 4.5. Retail and G&A costs

The main inputs related to the determination of the retail costs per retail tariff are defined in the worksheet '1F INP RET COSTS' of the model.

This worksheet includes different categories of retail costs inputs, which are clearly structured in separate blocks, as described below:

- ▶ **Customer life:** Includes the churn rates of the operators' customers for the different access options considered (voice, xDSL and FTTH). Based on the inputted churn rate, the customer life is also calculated in this block. The relation between churn rate and useful life is defined by the following formula:

$$CustomerLife = -\frac{1}{LN(1 - ChurnRate)}$$

- ▶ **Migrations and disconnections:** Includes the percentages of migrations and disconnections for the wholesale access solutions.
- ▶ **G&A costs:** Refers to the G&A mark-up which is applied on top of retail tariff's revenues to account for the G&A expenses in the model.
- ▶ **OPEX:** Includes the OpEx retail costs per external service, broken down by cost item.
- ▶ **CAPEX:** Includes the CapEx retail costs per external service, broken down by cost item.

All the inputs listed above come from the worksheet '1A RETAIL DATA' of the questionnaire to be populated by OTE, with supporting information from the OLOs, with the exception of G&A costs, which are extracted from the most up-to-date approved version of EKOS. While one-off and recurring expenses are presented in different columns in the questionnaire, these are shown in the same column (but in different rows) in the PSM. Therefore, the user should not paste the whole source matrix directly into the associated one in the PS model, but rather introduce one-by-one the retail inputs into their corresponding cells divided by each service volumes, as illustratively shown below:

Questionnaire		PSTN New Activation	PSTN Rental
Retail cost categories - OPEX		899-RET-ACC-PSTN-CON	899-RET-ACC-RENTAL-PSTN
Retail SAC			
Retail Installation Costs		-	-
		/ connection volume	/ rental volume
PS Model OPEX		Access.PSTN access	Access.ISDN access
Resource			
RES.Retail.SAC&SRC.SAC&SAR - One-off			
RES.Retail.SAC&SRC.SAC&SAR - Recurrent			
RES.Retail.Installation.Installation - One-off			
RES.Retail.Installation.Installation - Recurrent			

**Exhibit 4.19: Illustrative example of mapping the retail operational costs from the questionnaire to the PSM [Source: Axon Consulting]**

## 4.6. Geographical inputs

The main geographical inputs of the PSM are included in the worksheet '1G INP GEO'. As with the previous categories of inputs, this worksheet has been divided into separate tables to easily structure the different types of geographical inputs defined in it, namely:

- ▶ **Access network:** Includes the information about the geotypes, which is essential to properly consider their intrinsic characteristics in the determination of the cost items required to provide the services. This information comes from the worksheet '2A ACCESS DATA' of the questionnaire to be populated by OTE. However, this data cannot be directly copied from the questionnaire and pasted into the PSM because, while the questionnaire distinguishes between retail and wholesale lines, the PSM does not. Therefore, the retail and wholesale lines from the questionnaire should be added up to fill in this table in the model, as illustratively shown below:

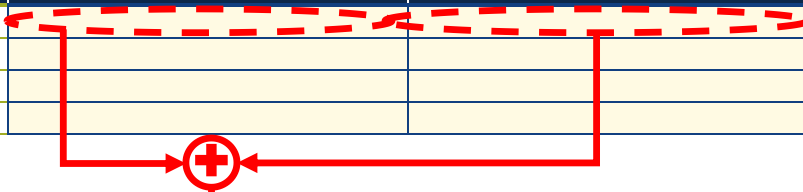


**Questionnaire**

Configuration	Number of ADSL retail lines from local exchange	Number of ARYS lines from local exchange
PHYSICAL-CAB		
PHYSICAL-LE		
DISTANT-CAB		
DISTANT-LE		

**PSM**

Geotype	Number of ADSL-LE Lines
PHYSICAL-CAB	
PHYSICAL-LE	
DISTANT-CAB	
DISTANT-LE	



**Exhibit 4.20: Illustrative example of mapping of ADSL lines of different geotypes from the questionnaire to the PSM [Source: Axon Consulting]**

- ▶ **Transmission links:** Includes information regarding the transmission links, such as the average distance from a local exchange to a BNG or BRAS, the percentage of urban and suburban exchanges per geotype or the average distance from a BNG/BRAS to a PoP (Point of Presence). Such links distance up to a BNG/BRAS has been defined based on the information provided by the SMP on its local exchanges and BNG/BRAS geographical location.
- ▶ **Backbone links:** Includes the information related to the distance and load factors of the terrestrial and submarine backbone links of a nationwide Greek operator. This information has been extracted from an ITU’s database and considers the traffic generated in each ring as per the SMP’s collected information.

## 4.7. Unitary costs per service

This section describes how the inputs of the unitary costs per network element and service are extracted from EETT’s Bottom-Up models and introduced in worksheet ‘1H INP COST RES LRIC+’ of the PSM. Specifically, the sources for the unitary costs are the following Bottom-Up models:

- ▶ EETT’s FTR Bottom-Up model
- ▶ EETT’s NGA Bottom-Up model

The following shows a snapshot of the interface to introduce these parameters:

**SERVICES LRIC UNITARY COST PER COST ITEM FROM BULRIC MODELS**

The LRIC unitary costs that will be used to calculate own network costs are shown in this table

Source	EETT BU Models		
Update Date			
Cost item	BULRIC Service		
	xDSL 24 Mbps	xDSL 30 Mbps	xDSL 50 Mbps
CI.Own Network.Co-location.DSLAM			
CI.Own Network.Co-location.Line Cards			
CI.Own Network.Co-location.Network-facing Ports			
CI.Own Network.Co-location.Air Conditioning Unit			
CI.Own Network.Co-location.Power Supply Unit + Backup			
CI.Own Network.Co-location.Layer 2 Aggregation Switch Network Facing Cards			
CI.Own Network.Co-location.Layer 2 Aggregation Switch			

**Exhibit 4.21: Illustrative excerpt of the unitary costs inputs worksheet [Source: Axon Consulting]**

### 4.7.1 EETT’s FTR Bottom-Up model

The unitary costs per voice service network element (e.g. interconnection SBC - chassis) and retail service introduced in worksheet ‘1H INP COST RES LRIC+’ of the PSM are also extracted from EETT’s FTR Bottom-Up model. It should be noted that the EETT’s FTR Bottom-Up model does not output the unitary costs of the considered network elements. To that end, a calculation is necessary for the extraction of the unitary costs. The inputs contained within the model for this calculation are listed in the following:

- ▶ The yearly demand per service *i* in minutes (*Minutes<sub>i</sub>*).
- ▶ The yearly demand per service *i* (*Demand<sub>i</sub>*) in terms of traffic volume (Busy Hour Erlang - BHE) and number of outgoing call attempts (Busy Hour Call Attempts - BHCA).
- ▶ The routing factors per service *i* and network element *j* (*RF<sub>ij</sub>*).
- ▶ The resources costs without incremental termination costs per service *i* per network element *j* (*Res<sub>ij</sub>*).

In order to calculate properly the unitary costs, the demand - *Minutes<sub>i</sub>* - of the FTR model should be adjusted to the market share of the reference operator determined for the PSM.

Given the above information, the unit costs per service *i* for a network element *j* (*Cost<sub>servij</sub>*) can be extracted using the following formula:

$$Cost_{servij} = \frac{RF_{ij} \cdot Demand_i}{\sum_i RF_{ij} \cdot Demand_i} \cdot Res_{ij}$$

These costs are obtained considering the same WACC applied on the capital employed as the one defined within the PSM, as well as representing the modelled reference operator.

#### **4.7.2 EETT's NGA Bottom-Up model**

The unitary costs per network element and retail service introduced in worksheet '1H INP COST RES LRIC+' of the PSM are extracted from EETT's NGA Bottom-Up model. It should be noted though that the latest version of EETT's NGA Bottom-Up model outputs the unitary costs for most of the considered network elements per service. For the remaining network elements considered in the PSM, the unitary costs are calculated following the same methodology as the one embedded in the EETT's NGA Bottom-Up model. For instance, the own network unitary costs are extracted from the NGA model following the same approach as the disaggregation of network element by service presented in the worksheet 'LRIC' of such model, extending the exercise to all the relevant services of the model.

Therefore, the unitary costs considered in the PSM are obtained from EETT's NGA Bottom-Up model considering the same WACC applied on the capital employed as the one defined within the PSM, as well as representing the scale of the reference operator by means of a mark-up.

## 5. How to read the PSM's outcomes

This section describes the main outcomes produced by the model and how these should be understood by the user when assessing the economic replicability of the retail tariffs introduced into the model.

As introduced in section 2, the model includes two main worksheets with results:

- ▶ Summary of outputs per retail tariff
- ▶ Detailed data per retail tariff

These two worksheets are described in the following subsections.

### 5.1. Summary of outputs per retail tariff

This worksheet ('9A OUT RT') is the main output of the model. It provides a full overview of the revenues, costs and margins per retail tariff (Horizontal axis) by means of the following blocks:

- ▶ **Overview of the results:** It shows the total revenues, costs and margin per tariff for the year under assessment. Additionally, it clearly shows (green or red cells) whether the retail tariffs assessed pass the margin squeeze test or not. The exhibit below provides a snapshot of the information provided under this block:

MARGIN SQUEEZE TEST		Tariff A
Tariff category		FTTH
Revenues	EUR/user/month	50,77
Costs	EUR/user/month	25,77
Margin	EUR/user/month	25,00
Pass?		Yes
% margin on revenue		49,24%

**Exhibit 5.1: Overview of the results for a sample tariff [Source: Axon Consulting]**

As shown in the exhibit above, the sample tariff presented has a positive margin on revenue (+49.24%) and therefore passes the price squeeze test.

- ▶ **Monthly values per customer:** It provides some further disaggregation of the retail tariffs' costs (e.g. split between retail wholesale, own network, G&A and other) and shows all revenues, costs and margin information as a value per month and line. The exhibit below provides a snapshot of the information provided under this block:

#### SUMMARY OF THE MONTHLY REVENUES AND COSTS PER CUSTOMER

This table calculates a summarised version the per customer monthly revenues and costs for each

Category	Unit	
<b>Revenues</b>	EUR/customer/month	<b>50,77</b>
<b>Costs</b>	EUR/customer/month	<b>25,77</b>
<b>Retail</b>	EUR/customer/month	<b>3,57</b>
Direct	EUR/customer/month	3,57
Indirect, Common & Joint Costs	EUR/customer/month	-
<b>Wholesale</b>	EUR/customer/month	<b>13,57</b>
Direct	EUR/customer/month	12,97
Indirect, Common & Joint Costs	EUR/customer/month	0,61
<b>Own network</b>	EUR/customer/month	<b>4,28</b>
Direct	EUR/customer/month	-
Indirect, Common & Joint Costs	EUR/customer/month	4,28
<b>G&amp;A</b>	EUR/customer/month	<b>4,35</b>
Direct	EUR/customer/month	-
Indirect, Common & Joint Costs	EUR/customer/month	4,35
<b>Others</b>	EUR/customer/month	-
Direct	EUR/customer/month	-
Indirect, Common & Joint Costs	EUR/customer/month	-

#### Exhibit 5.2: Monthly values per customer for a sample tariff [Source: Axon Consulting]

This table provides a clearer view of the results of the sample retail tariff. For instance, it becomes easy to spot that wholesale costs are the main cost source in the provision of this tariff (>50% of the total).

- ▶ **Disaggregated Results:** Finally, this third table provides a detailed disaggregation of the main cost generators (more than 40 different cost items) to further understand the results produced by the model. The exhibit below provides a snapshot of the information provided under this block:

**DETAILED MONTHLY REVENUES AND COSTS PER CUSTOMER**

This table calculates a detailed version the per customer monthly revenues and costs for each Ret.

<b>Category</b>	<b>Unit</b>	
<b>REVENUES</b>	EUR/customer/month	<b>50,77</b>
<b>COSTS</b>	<b>EUR/customer/month</b>	<b>25,77</b>
<b>WHOLESALE COSTS</b>	<b>EUR/customer/month</b>	<b>13,57</b>
<b>Narrowband traffic-dependent</b>	<b>EUR/customer/month</b>	<b>0,30</b>
Fixed call termination	EUR/customer/month	0,07
Mobile call termination	EUR/customer/month	0,08
International call termination	EUR/customer/month	0,14
<b>Narrowband customers-dependent</b>	<b>EUR/customer/month</b>	<b>0,01</b>
Number Portability	EUR/customer/month	0,01
Wholesale Line Rental	EUR/customer/month	-
<b>LLU</b>	<b>EUR/customer/month</b>	<b>-</b>
Full ULL	EUR/customer/month	-
VPU	EUR/customer/month	-
VPU LIGHT	EUR/customer/month	-
Co-location	EUR/customer/month	-
Distant Co-location	EUR/customer/month	-
<b>VPU FTTH</b>	<b>EUR/customer/month</b>	<b>12,66</b>
FTTH	EUR/customer/month	12,66
<b>Broadband</b>	<b>EUR/customer/month</b>	<b>0,61</b>
Bitstream backhaul	EUR/customer/month	0,61
<b>OWN NETWORK COSTS</b>	<b>EUR/customer/month</b>	<b>4,28</b>
Own Transmission Network	EUR/customer/month	0,00
Own Core Network	EUR/customer/month	4,08
Internet Connectivity	EUR/customer/month	0,20
Centrex Platforms	EUR/customer/month	-
<b>RETAIL COSTS</b>	<b>EUR/customer/month</b>	<b>3,57</b>
<b>Customer dependent</b>	<b>EUR/customer/month</b>	<b>3,09</b>
Bad Debt	EUR/customer/month	0,10
Billing	EUR/customer/month	0,17
Customer care	EUR/customer/month	0,84
SAC&SRC	EUR/customer/month	1,09
IT	EUR/customer/month	-
Installation	EUR/customer/month	0,44
Sales	EUR/customer/month	0,19
Working Capital	EUR/customer/month	-0,04
Customer Equipment	EUR/customer/month	-
Gifts&Discounts	EUR/customer/month	0,30
<b>Non-customer dependent</b>	<b>EUR/customer/month</b>	<b>0,49</b>
Advertising	EUR/customer/month	0,49
<b>G&amp;A</b>	<b>EUR/customer/month</b>	<b>4,35</b>
Overhead	EUR/customer/month	4,35
<b>OTHER COSTS</b>	<b>EUR/customer/month</b>	<b>-</b>
Additional	EUR/customer/month	-

**Exhibit 5.3: Disaggregated results per customer for a sample tariff [Source: Axon Consulting]**

This table, in turn, provides maximum transparency on the items generating costs in the provision of the tariffs under assessment. For instance, by looking at this table it is possible to identify that, actually, most wholesale costs come from the VPU FTTH service.

## 5.2. Detailed data per retail tariff

The worksheet '9B OUT RT DETAILED' presents the detailed results for a single tariff. Particularly, it provides the same results as in the previous worksheet ('9A OUT RT'), while giving the user the option to select the individual retail tariff they want to extract.

In order for the user to read the results of a retail tariff, they need to select it from the drop-down list of the table 'Retail tariff selection' in the homonymous column. An excerpt of the worksheet and its controls is shown in the following exhibit, while the revenues and cost disaggregation will appear equivalently to the ones presented in section 5.1.

Retail tariff selection	
Tariff B	

*selected.retail.tariff*

### MARGIN SQUEEZE TEST

		Tariff B
<b>Revenues</b>	<b>EUR/user/month</b>	<b>42,83</b>
<b>Costs</b>	<b>EUR/user/month</b>	<b>37,27</b>
<b>Margin</b>	<b>EUR/user/month</b>	<b>5,56</b>
<b>Pass?</b>		<b>Yes</b>
<b>% margin on revenue</b>	<b>%</b>	<b>12,98%</b>
<b>% margin with only Direct costs</b>	<b>%</b>	<b>46,57%</b>

### SUMMARY OF THE MONTHLY REVENUES AND COSTS PER CUSTOMER

This table calculates a summarised version the per customer monthly revenues and costs for the Ret

Category	Unit	
<b>Revenues</b>	EUR/customer/month	<b>42,83</b>
<b>Costs</b>	EUR/customer/month	<b>37,27</b>
<b>Retail</b>	EUR/customer/month	<b>6,97</b>
Direct	EUR/customer/month	6,97
Indirect, Common & Joint Costs	EUR/customer/month	-
<b>Wholesale</b>	EUR/customer/month	<b>17,10</b>
Direct	EUR/customer/month	15,91
Indirect, Common & Joint Costs	EUR/customer/month	1,19
<b>Own network</b>	EUR/customer/month	<b>9,53</b>
Direct	EUR/customer/month	-
Indirect, Common & Joint Costs	EUR/customer/month	9,53
<b>G&amp;A</b>	EUR/customer/month	<b>3,67</b>
Direct	EUR/customer/month	-
Indirect, Common & Joint Costs	EUR/customer/month	3,67

**Exhibit 5.4: Illustrative representation of the interactive results per retail tariff worksheet [Source: Axon Consulting]**

