

ITU - HIPSSA G-5 (s) project
Regulatory auditing and cost modeling in sub-Saharan Africa
Briefing note

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To be read in parallel/conjunction with the attached questionnaire.

1 Executive summary

The ITU-EC joint project for “Harmonisation of ICT Policies in Sub-Saharan Africa” (HIPSSA) aims at developing and promoting harmonized policies and regulatory guidelines for the ICT market as well as building human capacity in the field of ICT. This project will result in the creation of harmonized regional and national policy, legal and regulatory frameworks conducive to significant investments in the ICT infrastructures and services.

One of the key components of the above stated objective of the project relates to tariff regulation which calls for two main activities namely: regulatory auditing and cost modeling. Liberalization of telecommunications in Africa has induced the need for nascent regulators to build up capacity in regulatory cost accounting/auditing and cost modeling in order for them to be better placed in regulating tariffs of operators for regulated retail and wholesale electronic communication services.

Bringing mobile termination rates down through appropriate cost accounting routines and cost modeling has been the key instrument for regulators in Europe and beyond to reduce communications prices. This is all the more crucial for Sub-Saharan Africa as mobile infrastructures are key for the development of the ICT sector.

So as to facilitate the development of a home-grown harmonized approach on regulatory auditing and cost modeling, and provide a basis for relevant capacity building within the region, ITU is conducting a study to elaborate an up-to-date review and assessment of regulatory practices in the region.

To this end, relevant quantitative and qualitative information are required from stakeholders. Accordingly, a common questionnaire has been elaborated to collect concrete and valuable input on regulatory practices implemented and/or foreseen in the stakeholders’ respective countries.

The aim of the present briefing note is to situate the questionnaire in the above mentioned process (chapter 2 to 5), explain the methodology used to elaborate this questionnaire (chapter 6) and give guidance on the key concepts pertaining to cost accounting and regulatory auditing (chapter 7).

2 Context

The ITU-EC joint project for “Harmonisation of ICT Policies in Sub-Saharan Africa” (HIPSSA) is building on the experience gained with a pilot project funded by European Commission (EC) and ITU that led to the adoption of Supplementary Acts for telecommunications to the ECOWAS Treaty. It aims at developing and promoting harmonized policies and regulatory guidelines for the ICT market as well as building human and institutional capacity in the field of ICT through a range of targeted training and knowledge sharing measures.

This project will result in the creation of harmonized regional and national policy, legal and regulatory frameworks conducive to significant investments in the ICT infrastructures and services.

Tariff regulation calls on two main activities regulatory auditing and cost modeling. ITU has been for a long time the primary forum of discussion on tariff and accounting principles including related telecommunication economic and policy issues (ITU-T SG-3 activities and recommendations, SG3RG-AFR, former TAF, etc.).

Liberalization of telecommunications in Africa has induced the need for nascent regulators to build up capacity in regulatory cost accounting/auditing and cost modeling for them to be in the situation of regulating tariffs of operators. ITU has largely responded to this need by running training workshops, proposing tools like COSITU, a didactic cost model, building up expertise in coordination with its network of Centers of Excellence.

Bringing mobile termination rates down has been the key instrument for regulators in Europe and beyond to reduce the communications prices.

Regional organizations across Africa have started to harmonize cost modeling by developing a model of reference like UEMOA and ECOWAS introducing a provision foreseeing the adoption of a standard methodology for West Africa (Supplementary Act on Interconnection).

3 Objectives

Today networks and services are undergoing major transformation moving away from circuit based communication, be it fixed or mobile, to ubiquitous packet based services.

Within the framework of its joint project with the EU, ITU is responding to the needs of HIPSSA beneficiaries and its members by providing regional organization with an up-to-date review of regulatory practices in their respective regions identifying trends on which they could build a common approach on regulatory auditing and cost modeling.

Based on this assessment, updated training material will be developed, delivered and embedded into the respective networks of regional associations of regulators and ITU Centers of Excellence to ensure a sustainable mechanism of delivery.

This training workshop's objectives are focused on helping participants to:

- Understand understanding price regulation and market analysis in the context of competitive provision of electronic communications services.
- Understand price controls and its relation to cost modeling, accounting and regulation.
- Appreciate the essence and requirements for regulatory auditing, accounting separation and cost modeling.
- Explore the various options for cost model development: accounting standards, concepts and key assumptions.
- Understand how cost models are developed.
- Review and compare existing public available cost models in the region and beyond and identify future challenges.

4 Outcome

The final report of the assessment study will be presented to the regional organizations (among them the AU Commission) and their member states¹ and could be an input to the development of regional and pan-African policy guidelines towards cost orientation of tariffs for electronic communication services' including interconnection rates.

Outputs of the assessment study will be used to update and customize the training material already available at the ITU. Some hands-on exercises will be made available on the basis of the challenges faced in each region and the selection of cost models and data sets publicly available in the regional and beyond.

¹ At the next AU pan-African ministerial meeting (CITMC-4)

5 Implementation

This activity shall cover the whole of sub-Saharan Africa and have three main phases:

Assessment study

- First phase: Development of regional assessment studies on costing strategies and cost model application and processes (development, data collection and application) using as references ITU publications², ICT Regulation Toolkit, previous training material³ and past experience on cost modeling and regulatory auditing. In this first phase, **data collection will be conducted through surveys and interviews (based on a common template)** with stakeholders. The study is divided geographically into four regions as defined by the African Union (AU): West Africa, Central Africa, East Africa and Southern Africa.
- Second phase: Consolidation of the findings of the regional studies' in a final report providing an overview of the whole of Sub-Saharan Africa, identifying best practices (from the region and beyond) and presenting the conclusions of national experiences' comparative analysis across the region and recommendations based on this and beyond.

A team of five experts will be completing the study. This team includes a senior international expert in charge of the team coordination (project management), an international subject matter expert and one regional expert for each of the following regions: West Africa, Central Africa, East Africa and Southern Africa.

A team of five experts will be completing the study. This team includes a senior international expert in charge of the team coordination (project management) and of establishing a common detailed methodology for survey and regional assessment and one regional expert for each of the following regions: West Africa, Central Africa, East Africa and Southern Africa.

Capacity Building

- Third phase: regional capacity building includes preparation of training material taking in to account the regional assessment studies and best practices developed in phase 1 and 2. This material will be delivered in face-to-face five days training workshop in each region.

² ITU-T Study Group 3 outputs and recommendations, etc.

³ Regulatory and Market Environment Division at the BDT, ITU Centers of Excellence, etc.

6 Methodology

So as to develop a home-grown harmonized approach on regulatory auditing and cost modeling, and provide a basis for relevant capacity building within the region, relevant quantitative and qualitative information are required from stakeholders.

To this end, a common questionnaire has been elaborated to obtain concrete and valuable input on regulatory practices implemented and/or foreseen in the respective regions.

The questionnaire is divided into the 3 following sections:

- Section 1 : Legal and regulatory framework for tariff regulation;
- Section 2 : Cost accounting and regulatory auditing ;
- Section 3 : Costing tool and cost modeling.

Section 1 – Legal and regulatory framework for tariff regulation

This section is aimed at providing an up-to-date overview on adopted price control strategies, their implementation, the difficulties encountered and the foreseen evolutions.

To this end, specific questions are to be answered by stakeholders in this section to provide relevant inputs on the adopted or foreseen regulatory framework:

- The type and the level of regulatory intervention in the local market as well as the underlying legal basis and regulatory strategy ;
- Difficulties encountered by NRAs, if any, and associated reasons ;
- Foreseen evolutions regarding the regulatory framework, regulatory strategies for new services and associated challenges.

Section 2 - Cost accounting and regulatory auditing

Cost accounting systems aim at providing the NRA with an in-depth and reliable knowledge of operators' costs. This is commonly viewed as key inputs to NRAs' regulatory intervention to ensure consumer welfare and sustainable competition and market development.

This section is aimed at providing an up-to-date overview on implemented procedures regarding cost accounting obligations and on associated regulatory auditing processes.

To this end, specific questions pertaining to key issues related to cost accounting methodologies are to be addressed by stakeholders in this section to provide relevant inputs on:

- Data collection processes ;
- Methodologies regarding scope of cost and cost preparation ;
- Degree of regulatory prescription on cost preparation methodologies ;
- Valuation and allocation methodologies including basis on which assets are valued and depreciated ;
- Level of cost of capital allowed and methodology used to calculate it.

To ensure and guarantee regulatory cost accounting relevancy, regulatory auditing is required. Regulatory auditing is the process of verification and validation of the regulatory accounting reports issued by operators.

The questions pertaining to regulatory auditing will give relevant inputs on:

- The scope of regulatory audit and the issues addressed ;
- The obligations to which the operator subject to regulatory auditing is bound and the underlying legal/regulatory basis ;
- The overall regulatory auditing process.

Section 3 – Costing tools and cost modeling development

Three main costing tools can be used in establishing the price of the regulated service under a price control obligation:

- Bottom-up model: starts with building from scratch the optimal network design to meet a given demand for the service included in the increment. Then, it assesses the use of each network element to the relevant increment.
- Top-down model: starts with the reality of the operator's actual costs but modifies the basis of cost valuation and allocation and applies appropriate cost/volume relationships (CVR)
- Benchmark: consists in comparing the prices of the service or of similar services in other relevant countries/markets

Those three costing tools can be used simultaneously. For example, the bottom-up model can be used in conjunction with a top-down approach (also referred to as hybrid model), benchmark can be used in conjunction with a top-down or a bottom-up model so as to check the output of the selected model...

This section is aimed at providing an up-to-date overview on the costing tool(s) implemented and on the methodology used to implement the chosen costing tool(s).

To this end, specific questions pertaining to key issues on the implementation methodology of the chosen costing tool are to be addressed (the section is divided into 3 parts corresponding to the 3 main costing tools).

- Bottom-up
 - Strategy adopted for implementation and level of dependency on the data provided by operators ;
 - Model assumptions and parameters: time horizon, level of demand, modeled operator, key cost drivers ... ;
 - Methodology used to design network, to model OPEX.
- Top-down
 - Methodology used to check and correct inefficiencies in operators' data ;
 - Cost/volume relationship (how costs change as the volume of the cost driver changes) and key cost drivers ;
 - Principles underlying the determination of the routing factors (relative usage of network by the different services).
- Benchmark
 - Benchmark scope ;
 - Criteria used for country selection process and underlying rationale ;
 - Methodology used to set price based on the output of the benchmarking.

7 Key concepts on cost accounting and regulatory auditing

Cost accounting consists in valuating and allocating the different relevant costs to regulated services.

A cost accounting system is a set of rules which supports the attribution of costs, revenues and capital employed to individual activities and services

Such a process may be run by NRAs when estimating the cost of providing regulated services or by operators when cost accounting is mandated for them.

Cost accounting obligations may be imposed to an operator, generally through a relevant market analysis process in the term of which the operator is notified as having a significant market power.

Cost accounting systems aim at providing the NRA with an in-depth and reliable knowledge of operators' costs. This is commonly viewed as key inputs to NRAs' regulatory intervention in, inter alia:

- Establish price control reflecting relevant costs in the regulated markets concerned ;
- Promote sustainable competition and innovation ;
- Prevent excess prices for end-users ;
- Estimate the cost of providing Universal Service Obligations (USO) as well as the required contributions for the universal service fund ;
- Run margin squeeze tests in order to ensure that the dominant operator is not abusing of its position ;
- etc

Cost accounting systems have to be built so as to be consistent with the regulatory principles of objectivity, transparency and causality.

The principle of cost causality refers to the fact that only costs incurred by the provision of a given service are allocated to this service.

To this end, and in case a cost accounting obligation is mandated for a given operator, NRAs might impose cost accounting specifications, consisting of a set of rules and procedures that are to be applied by mandated operators to establish their reports on revenues, costs, capital employed, assets ...

The questionnaire has been structured so as to be able to identify key cost accounting decisions made by NRAs that may have a bearing on cost/prices of services. They include the following:

Issue 1: Accounting system/allocation methodology

NRAs might decide on the appropriate accounting system/allocation methodology. The two main accounting systems are LRIC/LRAIC or FDC/FAC, yet other systems exist: SAC, EDC, MC...⁴

- Fully Allocated Costs (FAC), also referred to as Fully Distributed Costs (FDC), is an allocation methodology by which all relevant costs, including a share of the joint and overhead costs, are attributed to defined products and services.
- Long Run Incremental Costs is an allocation methodology based on calculating the cost of producing a specified additional increment in the long run. The long run is the period which allows one to fully adjust fixed assets to the level of demand.

Issue 2: Cost base and assets valuation

Due to the capital-intensive nature of telecommunications networks, assets valuation plays a significant role. Two main cost bases are used for assets valuation: Historic Costs Accounting and Current Costs Accounting.

- Historic Costs Accounting (HCA) refers to an accounting basis where assets are valued at their initial transaction value.
- Current Costs Accounting (CCA) refers to an accounting basis that recognizes and incorporates the effects of changing prices over time.

When using CCA, assets are valued based on the current replacement costs, consequently, NRAs have to decide on the relevant capital maintenance concept to be applied: FCM or OCM.

- o Financial Capital Maintenance (FCM) method assumes that capital is maintained if shareholders' funds at the end of the period are maintained in real terms at the same level as at the beginning of the period. Accordingly, all adjustments to asset values are reflected in the income statement.
- o Operating Capital Maintenance (OCM) method assumes that capital is maintained in such a way that the production of a certain amount of goods and services is ensured. Under OCM only current cost depreciation for the year is reflected in the income statement.

Issue 3: Depreciation methods and assets lifetime

Once the basis of assets valuation has been established, NRAs have to choose the depreciation method to be used to derive the annual charge. Depreciation is an important component of costs as telecommunications networks are capital-intensive and most telecom equipments face significant decrease in current assets values due to rapid technological development. Accordingly, the choice of the depreciation method and assets lifetime (depreciation duration) to be used is important.

⁴ SAC: stand alone costs; EDC: Embedded direct costs; MC: Marginal costs

Different depreciation methods can be used, the four main methods being the following:

- Straight-line: the annual depreciation charge is calculated by dividing the asset's purchase value by the asset's lifetime ;
- Annuity: calculates the annual depreciation charge that, after discounting, recovers the asset's purchase value and financing costs in equal annual amounts ;
- Tilted straight line: this method tilts the straight-line depreciation calculation by adding a factor to take into account the average annual change of assets price ;
- Tilted annuity: this method tilts the annuity depreciation calculation charge by adding a factor to take into account the average annual change of assets price.

Regarding depreciation duration, the choice of assets lifetime depends on the type of asset as the economic lifetime of different asset types can be significantly different:

- civil works / buildings ;
- power equipments ;
- telecom equipments ;
- license ;
- etc

Issue 4: Cost of capital

When NRAs calculate costs incurred in establishing a price subject to price control, it is relevant for NRA to allow a reasonable return on the capital employed as an efficient investment decision take into consideration the opportunity cost of the capital employed, taking into account the risks incurred.

The cost of capital reflects the return (profit) expected by shareholders, consequently no additional profit mark-ups on top of the cost of capital are required.

The Weighted Average Cost of Capital (WACC) methodology is a widely accepted method for calculating the allowed rate of return. WACC is calculated by applying cost of debt and cost of equity respectively on the proportion of debt and equity in the capital employed.

In case WACC is used, the cost of equity, which is affected by risk, need to be estimated as, contrary to cost of debt, it is not known or easily derived. To this end Capital Asset Pricing Model (CAPM) is usually used.

Consequently, regarding cost of capital, the questions pertaining to the following points need to be addressed by NRAs:

- The level of the rate of return if any allowed ;
- The methodology used to calculate it.

Issue 5: Regulatory auditing

Cost accounting is ultimately dependant on the reliability of the collection and allocation of data to ensure that operators are allocating costs to services in a relevant manner otherwise it would be nearly impossible to establish the cost of providing a specific service.

To ensure and guarantee regulatory cost accounting relevancy, regulatory auditing is required.

Regulatory auditing is the process of verification and validation of the regulatory accounting reports issued by operators. It includes verifying that the rules set out by the NRA are correctly applied.

So as to situate and understand how regulatory auditing is implemented by NRAs, the questions pertaining to the following points need to be addressed:

- The issues covered by the regulatory audit:
 - Reconciliation between the cost model and statutory accounts ;
 - Methodologies used for cost valuation and allocation ;
 - Methodologies used regarding cost capitalization, assets valuation and amortization ;
 - etc
- The obligations to which the operator subject to regulatory auditing is bound and the underlying legal/regulatory basis:
 - Access to the operator's internal supporting data and information ;
 - Timeframe to answer to the auditors requests ;
 - etc
- The overall process:
 - Occurrence of the audit ;
 - Body in charge of conducting the audit ;
 - Source of financing of (external) auditor (if this is the case)
 - Effective corrective action, audit follow up and close out mechanisms
 - etc