Calculation of the costs of efficient provision for some electronic communications services provided at the wholesale level in Romania

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Summary

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List of acronyms and definitions

ANCOM	National Authority for Management and Regulation in Communications of Romania
ARCEP	French National Regulatory Authority
BEREC	Body of European Regulators of Electronic Communications
BE	Belgium
BG	Bulgaria
BT	British Telecom
BU	Bottom-Up
CAPEX	Capital Expenditure
COMREG	Commission for Communications Regulation
CZ	Czech Republic
CPE	Customer Premises Equipment
DP	Distribution Point
DSLAM	Digital Subscriber Line Access Multiplexer
EBITDA	Earnings Before Interest, Taxes, Depreciation and Amortization
EC	European Commission
ERG	European Regulator Group
ES	Spain
EU	European Union
FR	France
FTR	Fixed Termination Rate
GNI	Gross National Income
HHI	Herfindahl-Hirschman Index
IMS	IP Multimedia Subsystem
IE	Ireland
IP	Internet Protocol
IT	Italy
LL	Leased Lines
LRAIC	Long Run Average Incremental Cost
LRIC	Long Run Incremental Cost
LTE	Long Term Evolution
Mbps	Megabits per second
MCA	Malta Communications Authority
MDF	Main Distribution Frame
MPLS	Multiprotocol Label Switching
MT	Malta
MTR	Mobile Termination Rate

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NGN	Next Generation Network
NPT	Norwegian Post and Telecommunications Authority
NRA	National Regulatory Authority
ODF	Optical Distribution Frame
OFCOM	British National Regulatory Authority
OLO	Other Licenced Operator
OPEX	Operational Expenditure
P	Provider
PE	Provider Edge
POI	Point Of Interconnection
PSTN	Public Switch Telephone Network
PT	Portugal
RT	Rom Telecom
SDH	Synchronous Digital Hierarchy
SMP	Significant Market Power
TDM	Time-Division Multiplexing
TR	Termination Rate
TV	Television
UK	United Kingdom
VoIP	Voice Over Internet Protocol

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0   Context and objectives

Taking into account the European Commission (EC) Recommendation mentioned under Article 15 of the Directive 2002/21/CE, ANCOM reviewed the different relevant markets in order to identify operators with a significant market power in the latest rounds of market analyses [1].

Pursuant to this review, ANCOM imposed a price control on several wholesale electronic communication services as it appears that there is a relevant risk of adverse effects arising from price distortion and that the setting of this cost orientation obligation is appropriate for the purposes of promoting efficiency, sustainable competition and conferring the greatest benefits on the end-users. These regulated services are:

- Mobile voice termination in public telephony networks;

- Fixed voice termination in public telephony networks;

- Fixed voice origination in public telephony networks;

- National switched transit of calls in public telephony networks;

- Ancillary services provided at the point of interconnection;

- Elements of leased lines terminating segments with transmission capacity of up to and including 2 Mbps provided by the incumbent; and

- Ethernet backhaul services provided by the incumbent.

As specified by ANCOM in its numerous Decisions published beginning 2012 and in 2011, significant market power (SMP) operators have to provide regulated services at efficient cost-oriented tariffs. Considering the regulatory framework in Romania and also the 2009 European Commission Recommendation on mobile and fixed termination rates, ANCOM with the assistance of TERA Consultants published in the first quarter of 2012 a Conceptual Framework which specified how the costs of these different services shall be assessed.

In order to take into account the specificities of Romania, ANCOM sent to operators detailed data requests whose answers have been then implemented into the cost models developed by TERA Consultants.

ANCOM set out by mid-November a first public consultation that described the four different analytical bottom-up models used to calculate the cost of above-mentioned regulated services. In order to best address the regulatory objectives of ANCOM, these models are using a forward looking long run incremental costing methodology.

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[1] ANCOM, Decisions no. 53-103/2012: Review of the fixed termination market; Decisions no.104-109/2012: Review of the mobile termination market; Decision no.6/2011: Review of the market related to leased lines services up to (including) 2Mbps.

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As a side result, the costs of other wholesale communication services have been produced via these models, thus enabling ANCOM a thorough understanding of the networks' functionalities and of the impact of introducing new technologies and which may be used in the future as the case may be.

Throughout the different interactions with operators, this consultation enabled to understand the concerns of stakeholders and to adjust if required the models in order to take utmost account of the specific circumstances of the Romanian market and its dynamics and to determine the relevant costs for the efficient provision of these services.

Once comments from operators were received, updated models and documents answering to operators' comments were elaborated.

The goal of this report is to describe how tariffs for regulated services shall be set for the period of the next price control, on the basis of the developed bottom-up LRIC cost models. The report is divided into five sections which correspond to the different categories of service at stake:

- Interconnection services, including mobile termination, fixed termination, fixed origination and transit (see section 1);

- Ancillary interconnection services (see section 2);

- Leased lines services with transmission capacity of up to and including 2 Mbps provided by the incumbent (see section 3); and

- Ethernet backhaul services provided by the incumbent (see section 4).

For each type of service, this report reassesses which cost standard should be used for the cost calculation in the associated cost model. This report also specifies in which manner regulated tariffs shall evolve and what pricing tool has been adopted in order to set the appropriate level of tariffs. Finally, in light of this pricing analysis, the consultation document stresses out for each type of service the economic impact of the price control on the different stakeholders including consumers and the industry.

1   Interconnection services

This section specifies our views on how ANCOM should set tariffs for the different interconnection services including:

- mobile and fixed call termination (see section 1.1);
- fixed call origination (see section 1.2); and
- transit (see section 1.3).

The outcome of each section will be the tariff of each of these regulated services.

1.1 Mobile call termination and fixed call termination

For both services, the cost orientation obligation[2] with costs being based on a bottom-up model has not been criticized by any stakeholders and is also recommended by the 2009 EC Recommendation on fixed termination rates (FTRs) and mobile termination rates (MTRs). Hence, the question to be answered at this stage is on which cost standard regulated tariffs shall be based: LRAIC+ or pure LRIC (see section 1.1.1). Then the report analyses if the remedy should be applied in a symmetrical way on the different stakeholders (see section 1.1.2) and assesses how tariffs should evolve during the period (see section 1.1.3). In addition, the report establishes whether and in which manner tariffs should be differentiated or not (see section 1.1.4). At last and based on these conclusions, the impact on the economic welfare is calculated (see section 1.1.5).

1.1.1   Assessment of the cost standard

According to the 2009 EC Recommendation on the Regulatory Treatment of Fixed and Mobile Termination Rates in the EU, national regulatory authorities (NRAs) shall adopt a specific cost standard when setting cost-based interconnection regulation: the pure LRIC approach.

> "It is justified to apply the pure LRIC approach whereby the relevant increment is the wholesale call termination service and which includes only avoidable costs. [...]
>
> In setting termination rates, any deviation from a single efficient cost level should be based on objective cost differences outside the control of operators. In fixed networks, no such objective cost differences outside the control of the

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[2] In addition to the cost orientation obligation based on bottom-up models, there are other possible regulatory price controls that can be envisaged for fixed and mobile termination rates including 'fair and reasonable prices', 'bill and keep', 'receiving party pays' and 'cost orientation based on benchmarking'.

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operator have been identified. In mobile networks, uneven spectrum assignment may be considered an exogenous factor which results in per unit-cost differences between mobile operators." [3]

In light of ANCOM's objectives of ensuring economic efficiency, promotion of competition and maximizing the end-users' benefits[4], this section determines whether Romania should follow the methodology recommended by the EC (pure LRIC) or the traditional LRAIC+ approach.

As reminder of the Conceptual Framework[5], this report shortly describes the two methodologies (see section 1.1.1.1), sets out the analysis of different economic criteria (see section 1.1.1.2), and finally details how common costs should be recovered (see section 1.1.1.3).

1.1.1.1 Description of methodologies

The Long-Run Incremental Cost (LRIC) approach also referred to as the long run average incremental costs (LRAIC) approach can be defined as the long-run cost of an "increment" of demand. It is calculated as the difference between the total long run cost of a network enabling to provide all services and the long-run cost of a network enabling to provide all services with the exception of the "increment". There are several possibilities to implement the LRIC methodology but the two main approaches generally considered are LRAIC+ and pure LRIC.

The traditional LRAIC+ approach operates with a broad increment. In the context of traffic services, the increment is composed of all services which contribute to all the traffic economies of scale in the network. With such a large increment, incremental network common costs of all traffic are taken into account. The cost of each individual service is then derived according to the cost allocation rule selected. This approach shares equally the economies of scale benefits among all services.

The "Pure LRIC" approach considers a comparatively smaller increment, the provision of a single service X. As a consequence, under pure LRIC the associated incremental cost of service X is the cost avoided in case service X is not produced. This cost is the difference between the total cost for producing all services and the total cost of producing all services with the exception of service X. With this approach, service X benefits to a great extent from economies of scale as neither network joint/common costs nor corporate overheads are taken into account.

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[3] Source : EC Recommendation on the Regulatory Treatment of Fixed and Mobile Termination Rates in the EU, 7 May 2009, §13 and 16

[4] Source: ANCOM, Government Emergency Ordinance no. 22/2009 establishing the National Authority for Management and Regulation in Communications, Article 4.

[5] The Conceptual Framework states at slide 17*: "ANCOM will calculate the cost of the following services on the basis of the pure LRIC approach: fixed and mobile call termination; and ancillary interconnection services provided at a point of interconnection"*

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Figure 1 – Description of LRAIC+ and pure LRIC methodologies
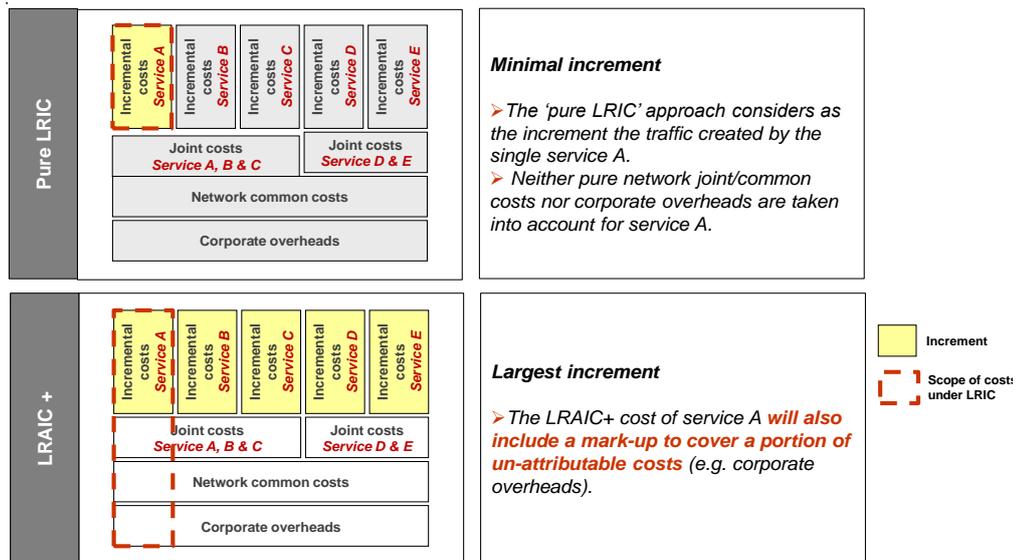
NB: The pure LRIC is a standard practice among EU countries (UK, Denmark, France, Austria, Portugal, Spain, Italy, Ireland, Sweden, Czech Republic, Bulgaria, Malta, and Belgium[6]) that use it - are on the way to - for mobile and/or fixed termination rates (MTRs and FTRs).

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[6] *Belgium* – BIPT second round decision on market 7 dates from June 29, 2010. However it is currently only in the process of developing a model that calculates pure LRIC for fixed termination and intends to apply the appropriate rates during 2013 in order to be in conformity with EC Recommendation. Source: BIPT, Decision 29 June 2010 - EC, SG-Greffe (2012) D/1866, case BE/2012/1279, January 2012 – BIPT, Draft presentation of NGN/NGA models, 4th January 2012.

Sweden - PTS is not fully following the EC Recommendation for FTRs in 2013 but expects to be by January 2014. PTS declared that it intends to develop a bottom-up model capable of generating pure LRIC estimates for 2013 Source: PTS, PTS arbete med prisregleringsprocessen, March 2012.

Portugal – ANACOM published the Decision related to the pure LRIC of MTRs but this decision is under appeal. Source: ANACOM, final decision of 30 April 2012. EC, SG-Greffe (2012) D/7486, April 2012

Austria - RTR expects to follow EC Recommendation immediately after completion of EC consultation process for FTRs and MTRs (notifications closed with comments end of April 2013) Source: Cases AT/2013/1435 and AT/2013/1436

France – ARCEP set out the final binding decision on the definition of the price control obligation for MTRs and FTRs Source: ARCEP, Decision n°2011-0483 for MTRs, Decision n°2011-0926 for FTRs.

Denmark - NITA confirmed that it plans to set FTRs in agreement with EC's Recommendation in 2013 Source: EC response to notification DK/2011/1264 for FTR.

United Kingdom – OFCOM already adopted pure LRIC for MTRs but for FTRs it is currently under consultation. Source: OFCOM, Wholesale Mobile voice call termination statement, March 2011 + Adoption of revisions to SMP Conditions in accordance with the directions of the Competition Appeal Tribunal of 8 May 2012 for MTRs, Narrowband market review, September 2012 for FTRs

Spain – Source: CMT, Approval of MTRs, May 2012. CMT adopted pure LRIC of MTRs.

Italy – Source: AGCOM, Decision of 17 November 2011 for MTRs. Also, in January 2013 AGCOM notified draft measure for FTRs based on mixed methodology - pure LRIC&FDC (case IT/2013/1415), withdrawn following BEREC opinion sharing EC serious doubts regarding the need to use a pure LRIC methodology for FTRs.

Malta – MCA published its bottom-up model which calculated the pure LRIC of FTRs which enables to set tariffs. Source: MCA, Bottom-up Cost Model for Fixed Networks and Fixed Interconnection Prices, 21st December 2012.

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1.1.1.2   Assessment on key economic criteria

As suggested by the Government Emergency Ordinance no. 22/2009[7], the choice of ANCOM between the two methodologies should be made by answering to the following questions:

- Which approach best ensures allocative, dynamic and productive efficiency?

- Which approach best promotes competition?

- Which approach maximizes consumers' benefits?

1.1.1.2.1   Economic efficiency

Generally, when assessing which price control obligation ensures best economic efficiency, this principle is considered from three different angles:

- allocative efficiency;

- dynamic efficiency; and

- productive efficiency.

Allocative efficiency is *"maximised when there is an optimal distribution of goods and services taking into account costs of supply and consumers' preferences"[8].*

Economic theory suggests that prices set at marginal cost lead to efficient outcomes, and are closer to the prices that might be expected in a competitive market (assuming no fixed costs or externalities). Following this logic ANCOM should seek to set regulated MTRs and FTRs as close to marginal cost as possible. This suggests that ANCOM should choose a pure LRIC rather than LRAIC+.

However, in the electronic communications sector, operators can incur significant fixed and common costs and these need to be recovered in some ways. The Ramsey-Boiteux pricing principle[9], which is theoretically speaking the best approach, suggests that for a multi-service regulated firm, all (wholesale and retail) services whose demand is not perfectly price elastic make some contribution to common costs. Leaving aside for a moment the challenging practical difficulties of Ramsey-Boiteux pricing, the lack of precedent for its application or the externalities, Ramsey-Boitteux pricing principles in

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Ireland – ComReg uses a benchmark of pure LRIC rates in other European countries in order to set MTRs in Ireland. For FTRs, ComReg uses its own BU LRIC model with the pure LRIC approach Source: ComReg, Final Decision Mobile and Fixed Voice Call Termination Rates in Ireland, 21 November 2012

[7] Source: Art. 4 to 6 of the Government Emergency Ordinance no. 22/2009 establishing the National Authority for Management and Regulation in Communications approved by Law no.113/2010, with the subsequent amendments and completions, ANCOM.

[8] Source: OFCOM, Wholesale mobile voice call termination statement, March 2011, p.173

[9] The Ramsey principle has never been implemented by any NRA due to its complexity.

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this case would be applied to services in different markets, and not to services in one single market, as the original theory has been developed. Furthermore, some services could receive a larger share (of common costs) not in response to their lack of elasticity or to consumers' preferences, but due to the monopolistic conditions surrounding their provision, at the expense of other services. BEREC notes in this context that "*under a CPP regime, termination markets present the characteristics of natural monopolies, a situation which heavily impacts price elasticities in these markets*"[10].

Although total costs are recovered taking into account all the services, in many cases, competitive service prices do only cover the incremental/marginal costs, either to attract customers or following the providers' optimisation calculations to achieve the best outcome in a two- or multi-sided market.

Also, it is important to note that the specific characteristics of the termination services have distributional effects which impact the allocative efficiency. For example, it is widely recognized in the economic theory that termination services are two-way access services which under a CPP regime encounter an externality. While it is also agreed that the distribution of utility in a call cannot be specified with certainty, the European Commission has taken this externality into account when recommending a pure LRIC approach for termination services: "*both calling and called parties jointly cause a call to be made and jointly benefit from the call. In that respect, call termination differs from other markets where the creation of costs and attribution of benefits can be ascribed to one side only*"[11]. On the other hand, a LRAIC+ approach for these services does not take account the distributional impacts, neglects the call externality and does not capture the specific characteristics of termination services.

Allocative efficiency also suggests one group of customers should not subsidize another group of customers. Considering the competitive dynamics in the electronic communication sector, fixed and mobile operators compete to attract consumers on their call markets.

Under a LRAIC+ approach for termination, the different sensitivity of the mobile access networks to traffic levels (as compared with fixed networks), means that mobile operators would be allowed to recover from regulated termination a much higher cost base than a fixed operator, as compared with a pure LRIC approach. Under LRAIC+, mobile operators can recover a larger proportion (as compared with pure LRIC) of their access networks through regulated services at the expense of fixed operators, and ultimately consumers, while at the same time all the fixed access costs are recovered on the competitive retail side, from the same fixed consumers. BEREC notes that "*Such a situation underestimates the competitiveness of the mobile operators, is detrimental to the level playing field between fixed and mobile operators and could fuel fixed-to-mobile substitution*"[12]. On the other hand, the narrow definition of the increment

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[10] BoR (13) 47

[11] Explanatory note on the 2009 European Commission Recommendation, page 15.

[12] BoR (13) 47

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implied by the use of pure LRIC approach ensures a level playing field between fixed and mobile operators.

Last, the significant network effects in the mobile sector in Romania under LRAIC+ regime are notable. The largest part of call traffic is on-net, as a response of very competitive retail offers for on-net calls, while the competitiveness of offers for off-net calls is biased by the LRAIC+ termination rate.

The outcome is therefore that the allocative efficiency criterion recommends the use of pure LRIC for two-way access services (such as termination) and LRAIC+ for other services.

Dynamic efficiency refers to the ability and incentives of operators to continue to invest in the services they currently provide and to innovate by launching new or improved services.

It should be noted beforehand that the costs of services calculated here are not estimated based on the actual operator's costs, as this would not provide the right incentives for operators to innovate and increase efficiency, but based on the costs of an efficient operator (bottom-up approach of a generic operator). To the extent services would reflect each operator individual costs, more efficient operators would finance the inefficiencies of other operators (and vice-versa), a circumstance which would provide contradictory economic signals and would be detrimental to welfare. Furthermore, to the extent the same services are provided by several operators, the principle of symmetry is proposed.

In the context of termination rates, another dynamic efficiency concern is whether the decline in overall revenues, when cost orientation based on pure LRIC, could affect operators' ability to finance their investments which will be driven by their future profitability expectations and their need to remain competitive in the retail market.

In relation to investments, the European Commission has identified that "*allowing network costs to be recovered from the wholesale termination rate which do not result directly from the provision of that service can lead to distorted signals and higher prices for the originating operators and, consequently, their consumers, in effect, this results in them cross-subsidising the investment costs of other operators' networks (…)*"[13].

Mobile and fixed operators generally argue that the decrease of FTRs and MTRs leads to a decrease in their ability to invest.

However, recent studies have shown that the effect is not clear-cut. For instance, Friederiszick, Grajek and Röller[14], have found in their model that regulation[15] has a

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[13] Ibidem, page 14

[14] Source: Analysing the Relationship between Regulation and Investment in the Telecom Sector Friederiszick, Grajek and Röller, 2008.

[15] Including price regulation such as regulation of termination rates, quantity regulation and market-entry regulation

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statistically significant impact on a fixed entrant's investment, while there is no statistically significant impact for either fixed incumbents or mobile operators.

Table 1 – Dynamic model of investment: results from instrumental variables (IV) estimation (dependent variable = Log(Infr))

Endogenous variable	Results of instrumental variables (IV) estimation[16]
EntryFix incumbent	-0.02 (0.21)
EntryFix Entrant	-0.44 (0.15)
EntryMob Mobile	0.87 (0.82)

Source: Friederiszick, Grajek and Röller, 2008

More importantly, this seems contradicted by the reality. Indeed, in France for example, the decrease of termination rates facilitated the entry of the fourth mobile operator on the mobile market (along with other measures in favour of its entry). At the same time and despite general price decreases, existing operators massively started investing in the long term evolution technology (LTE) in order to propose new services[17].

Despite the decrease of MTRs over the past few years, a large number of European operators invested in LTE spectrum auctions and deployed the associated networks. For example, the earliest countries where LTE was deployed are Sweden, Poland, Finland and Austria (see Figure 3) and these countries have MTR below the EU average, especially for Austria and Sweden which have MTR levels very close to pure LRIC levels.

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[16] Robust standard error are in brackets

[17] Source: Interview of the chairman of FT on BFM business, 24 September 2012. Press conference of the chairman of SFR on 28 November 2012

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Figure 2 – Evolution of the average MTR in Europe
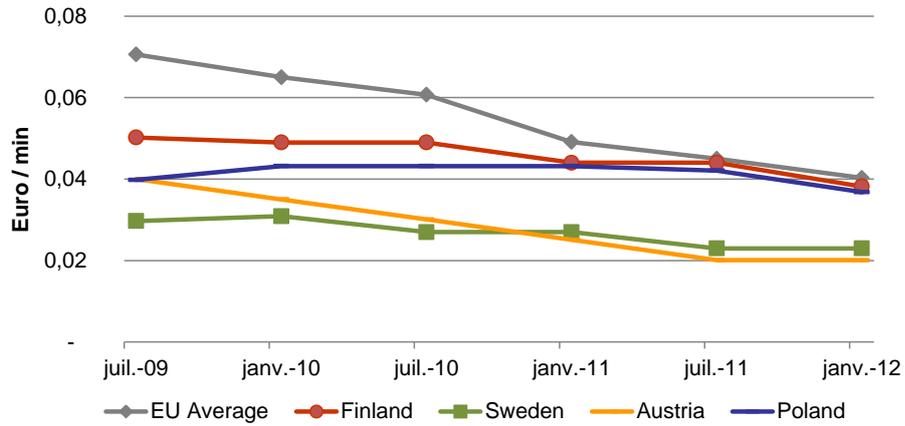
Source: BEREC MTR snapshot from July 2009 to January 2012

Figure 3 – LTE systems launched and on-going deployed
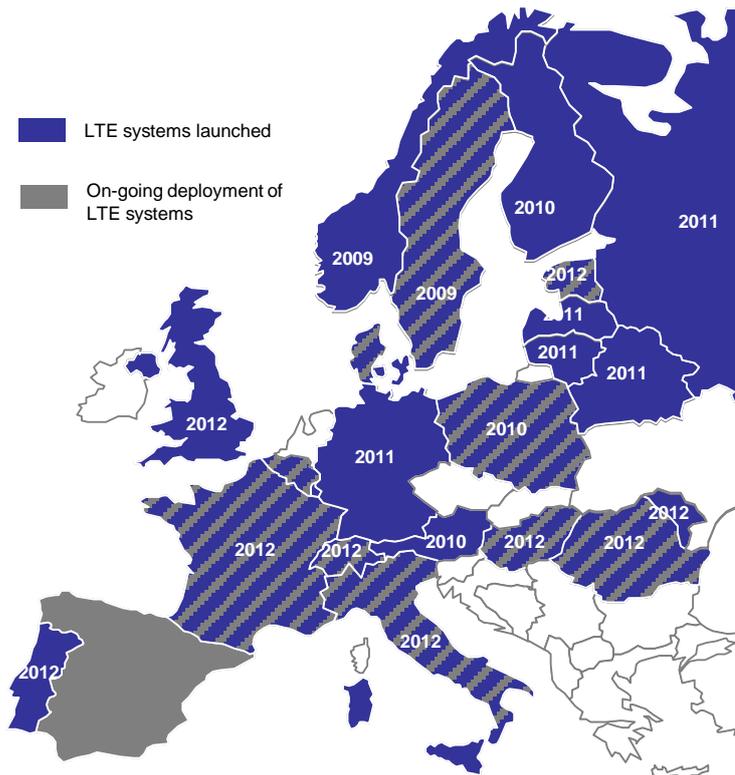
Source: GSA and Informa telecoms and media[18]

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[18] Source: Informa telecoms and media, White paper successful LTE strategies, How to use LTE to build a compelling broadband strategy, 2012 – GSA, Status on the global LTE 1800 market, 3rd January 2013 and 14th November 2012, GSA market update LTE development worldwide 5th February 2013.

The argument related to the reduction of investment, developed by Cosmote in its answer to the consultation on cost calculation, cannot be therefore relevant:

> *"Whilst it is true that operators in Romania have committed to invest €682,136,036 in acquiring licences for 4G spectrum, this is only the first step. The benefits to end-users and the reality of the opportunities for operators anticipated by ANCOM depend on there being a valid business case for operators to make the further substantial investment to put in place the 4G network facilities."[19]*

Given the existing 2009 European Commission recommendation on the use of pure LRIC and considering discussions between operators and ANCOM since the 2008 market analysis[20], ANCOM's intention to applying the pure LRIC approach in Romania was known well before the acquisition of 4G licences. As a consequence, the amount invested by operators in Romania reflects their will to invest in 4G despite the likelihood of having MTRs set at the pure LRIC level in Romania. Operators would have not invested in spectrum if they thought the deployment of LTE was not possible in the context of much lower MTRs. ANCOM notes that two operators have launched 4G services end of 2012 while the third announced launch end of April 2013 and further announcements in relation to LTE deployments occurred recently in Romania.

Leaving aside for a moment the distributional impacts of LRAIC+ termination rates and their effects on allocative efficiency, the higher absolute asymmetry (between MTR and FTR) induced by LRAIC+ materializes in large monetary flows from fixed to mobile sector, with potential side-effects on the investments capacities and the attractiveness of fixed networks.

Nevertheless it is true that the use of pure LRIC would entail for some operators lower wholesale revenues compared to LRAIC+, while the opposite for others (depending on the traffic flows). In order to recover their shortfall in revenue, some operators may be tempted to try to adjust their overall retail charges so that profits remain as high as possible. This move is also known as the waterbed effect[21]. However, some operators attempt to increase prices which can be constrained by other operators who are better off following pure LRIC, so that there will be continuing pressures for retail prices to continue to decline so that the rebalancing effects shall be incomplete at best, as suggested by the EC[22] and the empirical study carried by Genakos and Valletti[23].

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[19] Source: Cosmote's answer to the consultation on cost calculation, 2012, p.32

[20] ANCOM already mentioned in 2008 that it will implement pure LRIC and that it was preoccupied by the asymmetry between FTR and MTR.

[21] The 'waterbed effect' refers to the situation where a change in one set of prices leads to changes in prices in a different part of the market

[22] Source: Implication for Industry, Competition and Consumers accompanying the EC 2009 Recommendation, p.32. Based on data from the EC and Frontier economics (The impact of recent cuts in mobile termination rates across Europe, May 2012), TERA Consultants noticed that, based on European averages, when MTRs decreased by over 23% on an annual basis between 2007-2011, mobile to mobile and fixed to mobile prices decreased respectively by 14% and 12% per year in the meantime.

[23] Source: Genakos and Valletti , Interconnection Regulation and the Structure of Mobile Tariffs, Information Economics and Policy

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The general outcome of the study commissioned by the Vodafone Group named "The impact of recent cuts in mobile termination rates across Europe" (April 2012) is more cautious. Indeed, the main conclusions of this report are that, on average across a selected group of countries, over the period 2009-2011 (during which MTRs decreased by 35.5% on average), the ARPM, the annual change in usage and the growth in penetration did not increase more than over the period 2007-2009 (during which MTRs decreased by 12.8% on average in Europe). However, using data published in annex of the report, ANCOM notes that, whatever the validity of the study made across a large number of countries, the conclusions are exactly at the opposite for Romania, which would tend to show the benefits of further decreasing MTRs:

- Between Q1 2007 and Q3 2009, MTRs decreased by 20% (1.37 c€/min) and:
  - ARPM decreased by 3 c€/min;
  - Penetration rate increased by 41 points;
  - Usage increased by 51 minutes per active subscriber and per month.
- Between Q3 2009 and Q3 2011, MTRs remained stable and:
  - ARPM decreased by 2 c€/min;
  - Penetration rate increased by 1 point;
  - Usage increased by 46 minutes per active subscriber and per month.

As a consequence, using exactly the same approach and same data as the ones used in this report but for Romania only, the conclusions would be that lower MTRs have had positive effects in the Romanian market. This would contradict the main conclusion of this report and therefore undermine its reliability at least for Romania.

Considering that i) different operators would likely be impacted differently by the implementation of pure LRIC; ii) some operators would likely be positively impacted; and iii) the intensity of competition in the Romanian retail markets, an eventual waterbed effect in Romania is therefore likely to be of trivial magnitude if not improbable.

As termination is a two-sided market and taking into account that there might be an incomplete waterbed effect, operators should be able to recover their costs and would therefore continue to have incentives to invest irrespective of whether termination rates are at or above pure LRIC. The BEREC strengthens this argument by stating that common costs shall be recovered by other services and not termination:

> *"According to recital 20 of the Access Directive, the method of cost recovery should be appropriate to the circumstances taking account of the need to promote efficiency and sustainable competition and maximize consumer benefits. Termination markets are an instance of two-way access where both interconnecting operators are presumed to benefit from the arrangement but, as these operators are also in competition with each other for subscribers; termination rates can have important strategic and competitive implications. A pure BULRIC approach takes into account this specific characteristic of the*

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termination markets, as it takes into account that the common costs can be recovered from services other than termination."[24]

The outcome is therefore that the analysis of the dynamic efficiency criterion advocates in favour of the pure LRIC approach for MTRs and FTRs.

Productive efficiency is maximized when firms fully exploit their economies of scale and scope and produce with the most cost efficient set of inputs (including technologies) available to them while maximizing the outputs. In the context of termination rates, the impact of a decrease is positive as productive efficiency is mainly achieved through lower inputs, which promotes competitive pressure at the retail level. The more there is competition on the retail market the more the operator is encouraged to be cost efficient.

Furthermore, from a productive efficiency point of view, recovery of common costs is preferable when performed from markets/services with effective competition, rather than in an administrative manner from regulated services.

The analysis of the productive efficiency therefore advocates in favour of the pure LRIC approach for MTRs and FTRs rather than of the LRAIC+ approach.

1.1.1.2.2 Promotion of competition

As foreword of analysing the impact of the two cost standards on the promotion of competition it is first necessary to assess some elements relevant for the price competition in the fixed and mobile markets in Romania.

Price competition in Romania

For the mobile market, one respondent provided numerous data during the first consultation phase which suggests that tariffs in Romania are competitive compared to other European countries. Indeed Romania appears to be in good position when comparing the number of minutes per user and the effective price per minute.

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[24] Source: BEREC, BoR (12)23, p.13

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Figure 4 – Benchmark of the number of mobile minutes per user Q2-2012
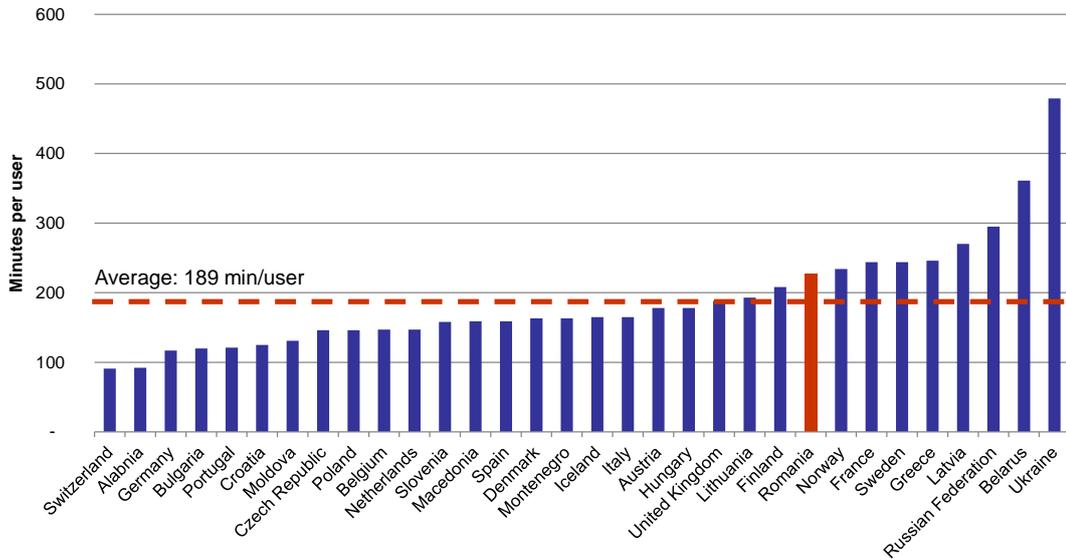
Source: Wireless Intelligence from Vodafone's answer during the first consultation phase

Figure 5 – Benchmark of the effective mobile price per minute Q1-2012
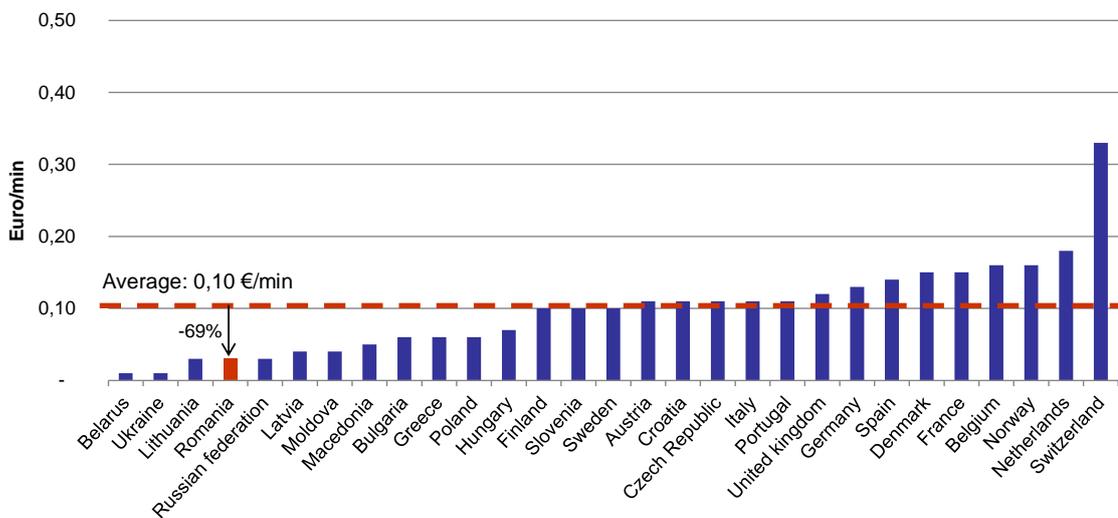
Source: Wireless Intelligence from Vodafone's answer during the first consultation phase

However, it shall be noticed that the scope of retail offers taken into account in this benchmark have not been specified. There is no clear mention of how this effective price has been determined which lowers the reliability of the data provided.

The analysis of the level of price competition cannot be limited to benchmarks in general, as there are several ways to define the effective price per minute. For example the ITU highlights in its 2012 report "Measuring the information society" another benchmark of price per minute which methodology leads to a completely different outcome regarding Romania. Hence this clearly stresses out that the methodology used for setting the level of price per minute is structural.

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Figure 6 – Mobile-cellular sub-basket as % of GNI per capita 2011
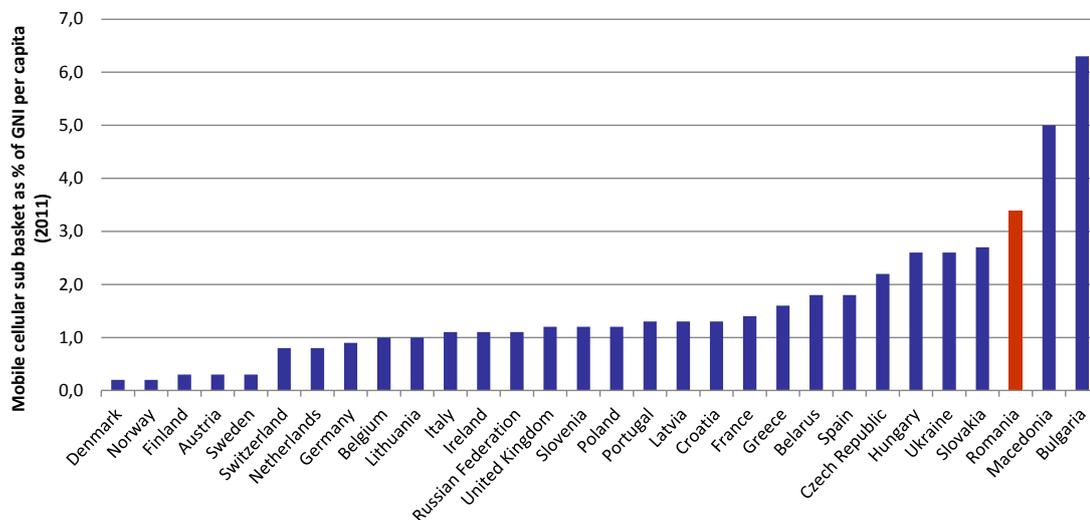
Source: ITU, measuring the Information society, 2012

In addition, ANCOM statistics based on Romanian operators' submissions indicate different ARPM figures.

As a consequence, it is not possible to conclude that there is sufficient price competition in the Romanian mobile market by just considering retail prices on a comparative basis with other jurisdictions. This is why other indicators are necessary.

Market structure and dynamics

Regarding the mobile market, several indicators can provide relevant information in this respect, such as operator numbers, market share evolutions, HHI, change of retail prices and structures, on-net/off-net issues, etc.

One of the first indicators to look at in the context of setting termination rates is the proportion of on-net calls which is extremely high in Romania. Indeed the average stands above 85% of the total traffic whereas in theory it shall be equal to the market share of the operator (with equal utility from consumers for on-net and off-net calls). It is to be noted that the EU average of the proportion of on-net calls rises up to 70% in Europe over the last years in the benchmarked countries[25] which is high but still significantly lower than the 2010 average in Romania. This tends to indicate that competition is not evolving on an appropriate trend as end-users are obliged to purchase several SIM cards in order to benefit of the advantages provided by the on-net/off-net tariff differentiation of each operator. Moreover, high termination charges not

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[25] Countries taken into account are Spain, Belgium, Turkey, Portugal, the United Kingdom, Sweden, The Netherlands, Greece, Poland, Luxembourg, Germany, France, Hungary, Malta, Slovenia and Italy. The period considered for this benchmark is from 2007 to 2011.

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only distort users' behaviour in that consumers buy one service to benefit from another[26], but they also discourage consumption of off-net call services.

Figure 7 – Proportion of on-net calls out of the total traffic for major Romanian mobile operators in 2010
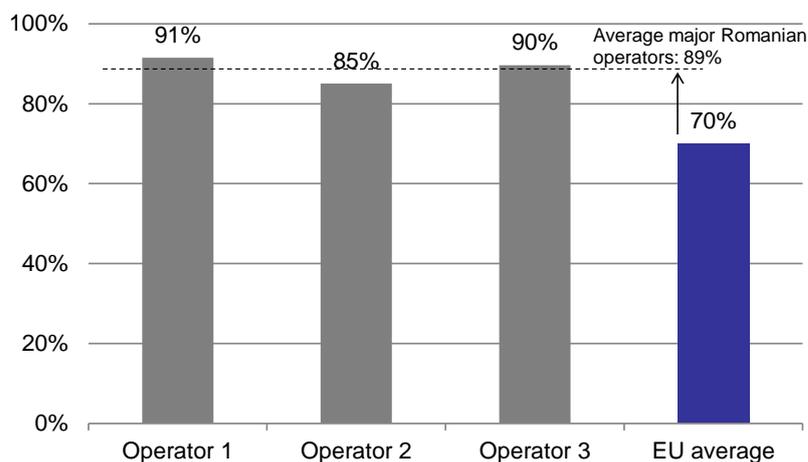
Source: TERA Consultants based on ANCOM's data

The Herfindahl–Hirschman Index[27] (HHI) may be also an appropriate indicator of the level of the competition in Romania. Results show that the HHI increases slightly over the last few years and still remains high according to the definition of the European Commission[28]. This means that the mobile market is becoming more and more concentrated.

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[26]Consumers buy multiple access services in order to benefit from lower call rates (and circumvent excessive off-net calls prices), not because they need multiple access *per se* – market research by ANCOM

[27] The HHI is a commonly accepted measure of market concentration. It is calculated by squaring the market share of each firm competing in a market, and then summing the resulting numbers.

[28] Source: EC, Guidelines on the assessment of non-horizontal mergers under the Council Regulation on the control of concentrations between undertakings, (2008/C 265/07)

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Figure 8 – Evolution of the HHI of the mobile market in Romania 2009-2011
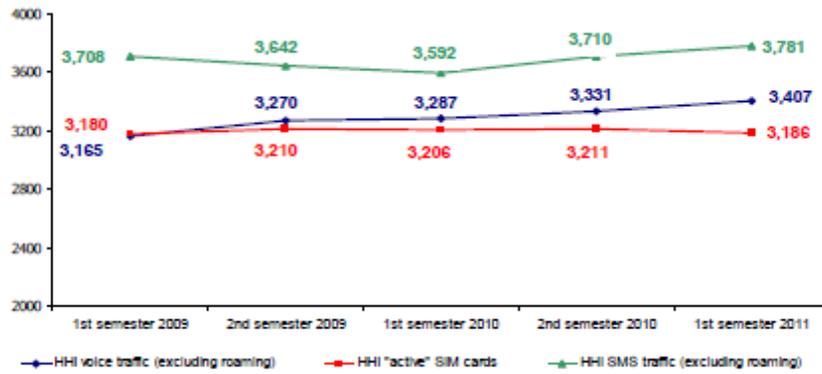
Source: ANCOM, statistical data report, Telephone services provided on terrestrial mobile public networks, 30th June 2011

When comparing simultaneously both indicators with similar countries that is to say where the market structure is similar to Romania, it appears that the position of Romania is significantly different from the one that is observed in European countries with the same number of mobile operators. Therefore this tends to confirm inferior levels of competition than the one observed in other countries.

Figure 9 – Comparison of the HHI with the proportion of on-net calls
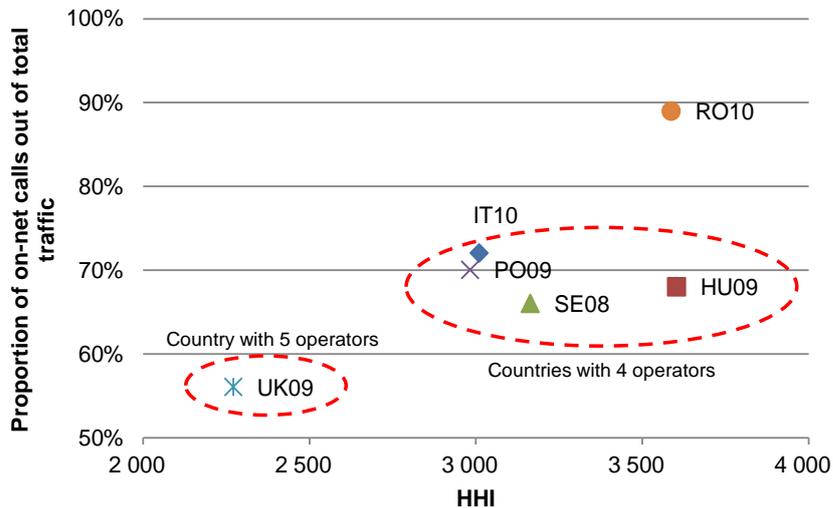
Source: TERA's analysis based on European operator's data

Finally, it is relevant to compare the level of the EBITDA margin of the different Romanian mobile operators to the EBITDA margin of the group to which it belongs. This also provides a good indication of the level of competition if there is a significant disparity between these two indicators.

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Comparative public data is only available for Vodafone's subsidary in Romania whose EBITDA margin reaches in average over the last three years 39% when Vodafone Group's EBITDA margin amounts up to 32%.

Figure 10 – Average EBITDA margin of Vodafone's subsidies over the period 2009-2012
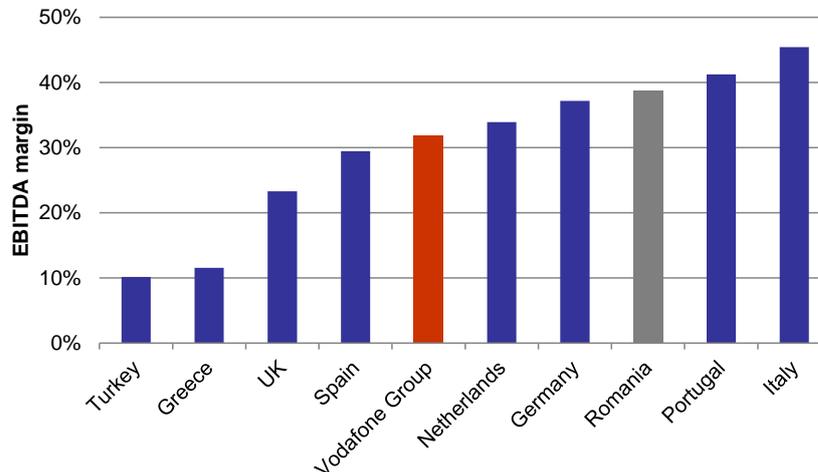
Source: TERA's analysis based on Vodafone Group data

The comparison of the EBITDA margin of Vodafone's subsidies points out that the pressure on retail market is not that much important as Vodafone Romania benefits of a significant EBITDA margin.

At a first glance, in terms of number of operators and general pricing, the level of competition in Romania may be appropriate. However when analysing in detail the different relevant indicators and segments of the market, the outcome is that the level of competition on the mobile market needs to be improved in order to reach the level observed in similar countries in terms of market structure.

Regarding the fixed market and the number of voice subscribers, it is to be but that the market share of RCS&RDS increases steadily over the last years and that the cumulative market share of the two largest operators is still significant. This supports the assumption that the level of competition on the fixed market is still not sufficient, but is steadily improving.

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Figure 11 – Evolution of the market share in terms of voice subscribers
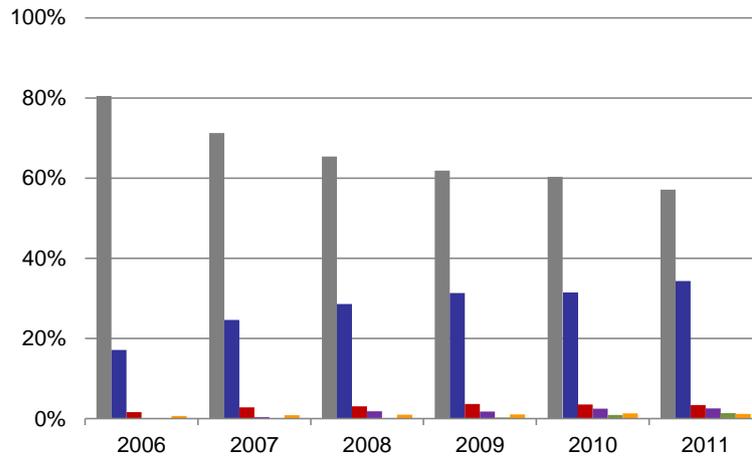
This is confirmed by the high level of the HHI in Romania. In spite of the slight decrease of the HHI between 2009 and 2011, it still remains at a high level. Therefore this indicates that the market is still concentrated and that the structure of the fixed market needs to be improved. It is important to note that, contrary to mobile markets which emerged with two competing operators, fixed markets have been dominated by a monopoly before 2003.

Figure 12 –Evolution of the HHI of the fixed voice market in Romania 2009-2011
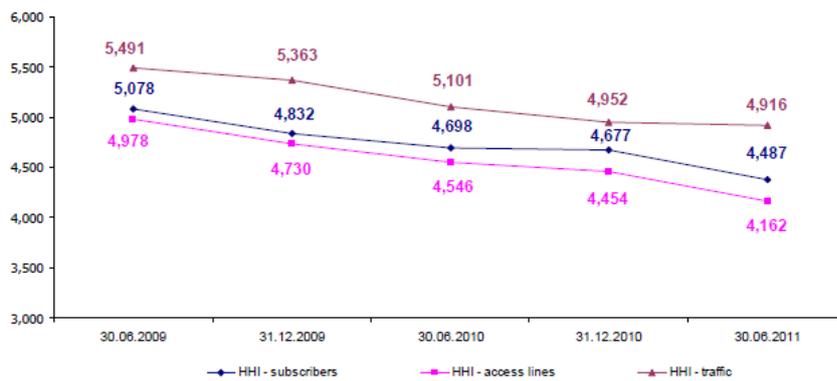
As for the mobile market, it can be also appropriate to analyse the level of on-net calls of Romanian fixed operators. The high level of this indicator for the first two fixed operator tend to suggest that competition is not following an appropriate trend.

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Figure 13 – Proportion of on-net calls out of the total traffic for major fixed operators in 2010
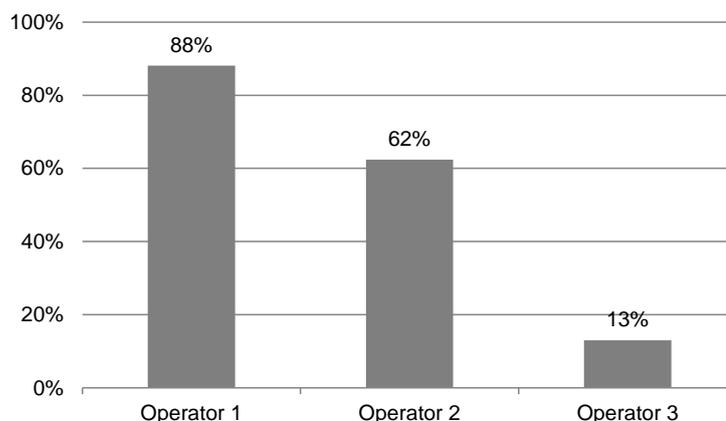
The outcome of this quick overview is that the fixed market does not support an appropriate level of competition and needs to be improved.

Being aware of the level of competition on both markets, it is then necessary to determine the impact of the two cost standards on competition in order to assess which may be the most appropriate in the Romanian context.

Impact of cost standards for termination on competition in Romania

The level of MTRs and FTRs sets a floor for retail off-net call prices. As pure LRIC considers a smaller increment of cost, it would reduce termination rates further than LRAIC+ and allow challengers to compete more easily on the retail market especially in the case of on-net/off-net retail price differentials. The implementation of the pure LRIC methodology would therefore have a positive impact on competition in Romania as suggested by the BEREC:

> *"There is an objective reason to recover common costs on retail markets rather than on the wholesale termination markets. By taking into account pure incremental costs when determining termination rates operators are being encouraged to recover their common costs on retail markets (on which there is a price constraint) and not on a monopolistic market (on which there is a risk of excessive prices). Moreover, operators have a disincentive to lower their off-net call prices because by so doing they generate more outbound traffic which attracts out payments to rivals. If termination rates decrease, the cost of terminating calls decreases for each operator and retail price competition increases as operators have stronger incentives to reduce their call charges. Lower termination rates would increase competition in call charges, so pure BULRIC delivering lower termination rates should be preferred in general to*

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plus BULRIC. Pure BULRIC is therefore generally more appropriate to promote competition and to ensure that users derive maximum benefit in term of price."[29]

On the contrary, if the level of MTRs is set by including common costs with the LRAIC+ approach it may affect **mobile-mobile competition** throughout different impacts. It should first dampen the incentive to reduce off-net call prices, as it has been underlined by BEREC in the case DE/2013/2014:

"It is well established in the economic theory that marginal costs directly influence prices. A reduction on mobile termination rates are entirely translated into lower marginal costs of providing an off-net call. From a theoretical standpoint, there are no reasons why not to expect lower prices for off-net calls in the presence of lower mobile termination rates, in a competitive market."[30]

In addition, as has been recently recognised in France[31], on-net unlimited offers launched by large operators could have strong anti-competitive effects as they tend to lock-in customers and generate a statistical effect in the case of market share asymmetries. Furthermore, such offers are difficult to replicate by small operators except with the launch of cross-net offers for which the launch is possible only with low termination rates.

The reduction of MTRs should also improve the net financial deficit that smaller operators face vis-à-vis larger operators, especially in case of traffic imbalance. As pointed out by the BEREC, the application of the pure LRIC approach should contribute to reflect the true value of the resources used at the margin for the provision of an off-net call.

"This will contribute to approximate the marginal costs of an on-net and of an off-net call, which, in turn, should contribute to the emergence of flat-rate tariffs or bundles with a larger content of "free" communications. Competition based upon more "realistic" price signals, which reflect the true scarcity of the resources used, should be welfare enhancing for consumers and contribute to higher levels of usage of mobile communications."[32]

Due to the reasons stated above, there is no argument that would allow concluding that a LRIC+ methodology would be better suited than a pure LRIC one, in what regards competition between mobile operators and the interests of consumers of mobile services.

For **fixed–fixed competition**, the reasoning is the same as for mobile-mobile competition. The use of the pure LRIC approach would reduce termination rates further

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[29] Source: BEREC, BoR (12)23, p.13

[30] Source: BEREC, BoR (13) 47, p.18

[31] Source: French Competition Authority, 12-D-24. December 2012. The Decision is under appeal.

[32] Source: BEREC, BoR (13) 47, p.18

than LRAIC+ which would allow challengers to compete more easily and therefore have a positive impact on fixed–fixed competition.

Regarding **fixed-mobile competition**, the reduction of MTRs based on pure LRIC would remove revenues paid by fixed operators to mobile operators. Indeed when taking into account 2011 traffic and wholesale rates applied at that time, it appears that revenues from fixed operators to mobile operators are significantly higher than those from mobile operators to fixed operators. The reduction of MTRs would therefore rebalance the revenues between fixed and mobile operators.

Table 2 – Transfer of interconnection revenues from Fixed to Mobile operators in 2011[33]

		1
FTR	c€/min	1.0
MTR	c€/min	5.1[34]
Number of minutes F2M	B of min	1.4
Number of minutes M2F	B of min	2.2
Charges paid by mobile operators to fixed operators	M€	21.2
Charges paid by fixed operators to mobile operators	M€	70.1

Source: TERA Consultants

Fixed operators will be therefore in a position to innovate and compete in a better way, e.g. by including calls to mobile in fixed call bundles. For example, currently only Romtelecom is able to include unlimited calls to Cosmote's[35] mobile network, and realizes it even for the most basic fixed telephony offers[36], while other operators' ability to provide unlimited calls to mobile is significantly constraint by termination levels. This has been clearly identified by the BEREC during its investigation on the German case DE/2013/2014.

> *"Fixed operators are generally constrained to some extent in their ability to offer flat rates for mobile call services as part of their flat-rate packages, due to MTRs being significantly higher than FTRs (as seen above). A pure LRIC approach in delivering lower MTRs, along with the application of symmetrical rates, is then deemed to be more appropriate in enhancing the ability of fixed operators in*

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[33] Volume of minutes considered are those specified in the service module

[34] The MTR taken into account is a weighted average of those applied in 2011, 5.03 cts/min for Vodafone, Orange and Cosmote; 5.67 cts/min for RCS&RDS.

[35] Cosmote is form the same group of companies with Romtelecom

[36] Voice unlimited 100 - http://www.romtelecom.ro/telefonie.html

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competing with lower fixed to mobile tariffs and in ensuring that end-users derive maximum benefit in terms of choice, price and quality of service. Indeed, MTRs set based on a pure LRIC methodology may incentivise fixed operators to launch innovative retail plans/bundles that may include unlimited and/or cheaper call rates. For example, fixed operators may consider including cheaper or larger /bigger in-bundle FTM calls."[37]

The EC also adds that in order to avoid any competition distortion between the different stakeholders, it would be more appropriate to implement the approach that best concurs on all stakeholders, that is to say fixed and mobile operators.

"The pure BULRIC method is also more appropriate to reduce competitive distortions between fixed and mobile operators. MTRs generally include part of the mobile access costs that are therefore recovered from fixed callers. On the other hand, all fixed access costs are recovered through retail charges. Fixed operators are also generally constrained to some extent in their ability to offer flat rates for mobile call services as part of their flat-rate packages, due to MTRs being significantly higher than FTRs. Compared to plus BULRIC, pure BULRIC generally reduces the asymmetry in absolute levels between FTRs and MTRs. Therefore the pure LRIC methodology in general better meets the objectives of Article 8(2) of the Framework Directive, according to which NRAs should promote competition by ensuring that there is no distortion or restriction of competition in the electronic communication sector." [38]

Due to the reasons stated above, the report is of the opinion that the pure LRIC approach is more effective in ensuring lower MTRs that would contribute to a more level playing field between fixed and mobile operators, and which would also encourage a greater usage of telephony services, thereby increasing overall consumer welfare.

Finally, regarding **competition at the European level**, if termination prices are set on the basis of LRAIC+ costing methodology rather than on the basis of the pure LRIC methodology, this may create barriers to the internal market. Indeed terminating operators in Romania will be then able, on the basis of the calling party pays principle, to benefit from higher rates at the expense of the operators, and ultimately the consumers, in the Member State from which the call originates where termination rates are set using the pure LRIC costing methodology. This has been underlined by the BEREC which states that:

"Operators from other EU Member States where termination rates are based on a pure LRIC methodology, will be forced to pay higher termination prices to German operators in case LRIC+ approach is employed, which would be twice as high the average pure LRIC tariffs from other countries that have set tariffs

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[37] Source: BEREC, BoR (13) 47, p.21

[38] Source: BEREC, BoR (12)23, p.13

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based on pure LRIC (via a bottom-up model or by benchmarking). These higher and asymmetric wholesale costs will translate into higher retail prices in competitive retail markets in other Member states. […]

Unjustified asymmetries in termination rates across the EU will lead to cross-subsidy of national operators by foreign operators and ultimately consumers."[39]

In light of the aforementioned, it appears that the application of the pure LRIC approach will enable to remove barrier to the internal market.

The analysis of the impact on competition of the implementation of both cost standards on the different stakeholders stresses out that the use of the pure LRIC approach for MTRs and FTRs better concurs to the Romanian context and promotes competition, as observed in other countries.

1.1.1.2.3 Maximization of end-users' benefits

Under the current regulatory framework, the primary mechanism for ensuring that users derive maximum benefit in terms of choice, price and quality, is competition.

As outlined previously, a higher decrease of mobile termination rates with the implementation of the pure LRIC methodology may lead to lower overall retail prices compared to LRAIC+ thanks to the increase in competition. Indeed, the waterbed effect might be incomplete at best if not inexistent. The past experience from regulating mobile termination markets suggests that competition at the retail level will induce operators to lower retail prices. This will therefore increase traffic volumes and maximize the end-users' benefit as noticed by the EC:

"The overall development of termination rates and retail prices […] does not seem to support the conclusion that reductions in termination rates would lead to increases in retail prices, as suggested by the waterbed effect. In addition, in countries with low termination rates, retail prices are frequently lower and consumption levels higher than countries with higher termination rates."[40]

In case of the reduction of fixed termination rates due to the use of the pure LRIC approach, the implication might be lower than on the mobile market due to the lower price elasticity for fixed calls. However, retail charges shall fall in a larger way with the use of pure LRIC rather than the LRAIC+ as outlined by the EC:

"The implications of the recommended approach when applied to FTRs will be less significant than in the case of MTR reductions due to different market conditions and product characteristics. First of all, FTRs are already much closer to the deemed efficient cost level and thus, much more moderate reductions could be expected as a result of the recommended methodology. Further to this, the less intense competition on the fixed markets and the lower

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[39] Source: BEREC, BoR (13) 47, p.24 and p.25

[40] Source: Implication for Industry, Competition and Consumers accompanying the EC 2009 Recommendation, p.31

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price elasticity of demand for fixed communications services leads to a lower level of pass through from fixed operators to consumers implying that retail prices would only be slightly affected and thus demand growth for fixed voice calls would also lag behind its mobile counterpart. However, assuming that the recommended approach also yields larger reductions in FTRs than under the existing regulatory approach, fixed retail prices would fall by a larger degree than when continuing with the current regulation and a higher growth in demand for fixed calls might be expected."[41]

However, it shall be also noted that the use of the LRAIC+ approach might favour the growth of mobile and/or fixed penetration, and that both penetrations are slightly lower in Romania compared to other European countries.

At a more granular analysis however, it has already been shown that mobile users buy multiple SIM cards in order to circumvent high prices for off-net calls[42], moreover they probably choose the provider of mobile telephony rather based on number of friends in the network, than on the retail prices on offer.

On the fixed voice market on the other hand, although network effects are less strong, voice is more and more sold in a bundle of services, where Internet and multichannel TV are the flagship products.

Furthermore it is considered that the use of pure LRIC instead of LRAIC+ may not affect the fixed and mobile penetration and more specifically the development of the mobile prepaid segment. Indeed, according to Cosmote:

"The prepaid segment has two important characteristics:

They receive more calls than they make and a high proportion of them make very few calls. In case of a drastic decrease in MTRs, these users' profitability will immediately decrease.

They are served disproportionately by smaller operators, more recently entered in the market, who had no other option but to address this segment first, as the profitable segments of users were already acquired by the biggest operators on the market."[43]

With the implementation of pure LRIC, these more recently entered operators will be in a position to provide attractive retail offers such as cross-nets offers and make enter the market more and more subscribers. This may therefore not hinder the end-users' benefits.

In order to fulfil its objective of maximizing the end-users' benefit, it appears therefore that pure LRIC is the best approach compared to LRAIC+ for MTRs and FTRs.

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[41] Source: Implication for Industry, Competition and Consumers accompanying the EC 2009 Recommendation, p.29

[42] on average there were 1,23 SIM cards per main user in 2010 (market research performed by ANCOM, natural persons)

[43] Source: Cosmote's answer to the consultation related to cost calculation, p.34

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1.1.1.2.4   Conclusion on the cost standard

Pure LRIC promotes in a better way allocative, dynamic and productive efficiency but also competition between operators to the ultimate benefit of end-users. Hence the pure LRIC approach is the best approach in light of the different objectives of the regulation in Romania for MTRs and FTRs.

1.1.1.3   *Treatment of common costs not recovered in pure LRIC*

The use of the pure LRIC approach leads to a situation where common costs and traffic invariant joint network costs cannot be recovered anymore through MTRs and FTRs. That does not mean that there are not any other ways to recover these common costs. As outlined in the Conceptual Framework, these costs may be recovered through either retail or wholesale services.

Figure 14 – Effect of EC recommendation on other voice products
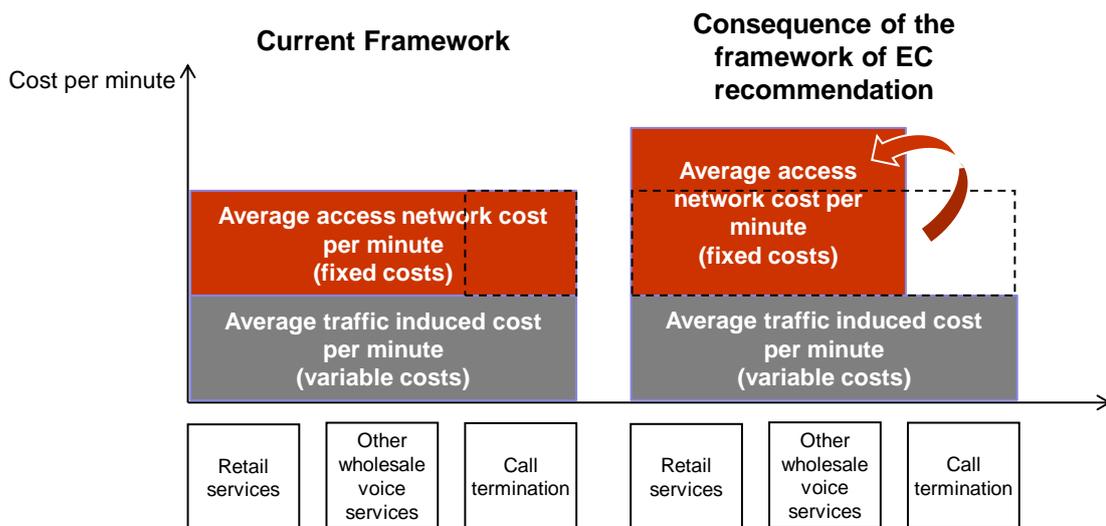
Source: TERA Consultants

This point will be further discussed in the section dedicated to origination rates (see section 1.2).

1.1.2   Assessment of the symmetry of the remedy

The implementation of the pure LRIC approach in the bottom-up models leads to the following results for the period 2013-2015:

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**Table 3 – Pure LRIC cost of mobile and fixed call termination services of operators –
2013-2015 as calculated in the BU-LRIC cost models**

c€/min		**2013**	**2014**	**2015**
F	Romtelecom	0.13	0.14	0.16
M	Orange	0,85	0,82	0,80
	Vodafone	0,48	0,48	0,47
	Cosmote	0,68	0,65	0,62
	RCS&RDS	0,35	0,35	0,35

Source: TERA Consultants

This section first analyses whether the principle of symmetry shall be applied or not for MTRs and FTRs (see section 1.1.2.1). The report then seeks on which operator MTRs and FTRs shall be set (see section 1.1.2.2).

1.1.2.1 Assessment of the symmetry

The principle of symmetry has been already applied in previous regulatory decisions, as suggested by the European Regulators Group (ERG)[44]. The 2009 EC Recommendation stresses out that MTR should be symmetrical under most circumstances:

> *"When imposing price control and cost accounting obligations […], NRAs should set termination rates based on the costs incurred by an efficient operator. This implies that they would be symmetric"[45]*

In the Explanatory Note accompanying the EC Recommendation, it is also outlined that the argument used by new entrant for the application of different rates in order to promote new entry and long term competition, is not relevant:

> *"A key argument frequently used in support of the authorisation of temporary asymmetric rates in favour of later entrants is that it forms part of an overall entry assistance policy which is aimed at promoting new entry and longer-term competition in fixed and mobile markets. The rationale is that allowing higher post-entry profits will encourage entry and investment and lead to more intense competition in the long run. However, it is generally accepted that such a policy may also attract inefficient entry. It may also be expected that consumers will end up paying higher retail prices than would otherwise be the case in a situation of cost-based symmetric termination rates. In addition, providing a*

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[44] Source: ERG, Common position on symmetry of termination rates, BoR(10)31

[45] Source: EC Recommendation on the Regulatory Treatment of Fixed and Mobile Termination Rates in the EU, 7 May 2009, Article 1

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mark-up for new entrants, while regulating incumbents at cost effectively, creates a cross-subsidy and can simultaneously reduce the incumbents' investment incentives.''[46]

It is therefore recommended to apply the principle of symmetry on MTRs which requires defining necessarily a generic operator.

For FTRs, as in the vast majority of NRAs in Europe, the principle of symmetry as recommended by the EC and the BEREC[47], was already applied in Romania.

The outcome of this analysis is therefore that the principle of symmetry shall be applied on FTRs.

As for MTRs, this requires defining a generic operator.

1.1.2.2   Specification of the generic operator

As explained in the Conceptual Framework and by the EC, termination rates shall be based on the cost of a generic operator using the following technologies: 2G and 3G for mobile access networks and NGN for fixed and mobile core networks.

"The cost model should be based on efficient technologies available in the time frame considered by the model. Therefore the core part of both fixed and mobile networks could in principle be Next-Generation-Network (NGN)-based. The access part of mobile networks should also be based on a combination of 2G and 3G telephony"[48]

After the consultation on the Conceptual Framework, it appeared that only the market share of this operator remains an issue.

For **mobile network modelling**, two approaches can be used to define the relevant market share of the generic operator. Either, the market share is defined as "1/Number of operators", i.e. 25% in the specific case of Romania[49]. Or, the approach followed by the European Commission in its 2009 recommendation could be used, i.e. the market share of the generic operator could be set at 20%:

"To determine the minimum efficient scale for the purposes of the cost model, and taking account of market share developments in a number of EU Member States, the recommended approach is to set that scale at 20% market share.[50]

The Conceptual Framework acknowledged that a 20%-25% target range of market share would be reasonable for the generic operator. Table 4 shows that pure LRIC costs of the generic operator are hardly sensitive to the market share.

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[46] Source: EC – Explanatory note on the recommendations of termination rates - 2009

[47] Source: ERG, Common position on symmetry of termination rates, BoR(10)31

[48] Source, EC, Recommendation on the treatment of fixed and mobile termination rates, 7 May 2009

[49] Taking into account the number of most active operators.

[50] Source: EC – Explanatory note on the recommendations of termination rates - 2009

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Table 4 - Cost of mobile call termination services of the generic operator

c€/min			2013	2014	2015
M	Generic operator	20%	0,89	0,87	0,84
		25%	0,88	0,86	0,84

Source: TERA Consultants

Mobile operators expressed different points of view when providing comments on the Conceptual Framework: Vodafone recommended the use of 33% Orange suggested the use of a percentage between 25% and 30%; and Cosmote agreed with the range proposed in the Conceptual Framework. Therefore a 25% market share should be used.

Taking into account the number of mobile operators in Romania and operators' views, it is recommended using a 25% market share for the generic operator.

For **fixed network modelling**, this has been already detailed in the Conceptual Framework beginning 2012: the market share of the generic operator is **set at each network level depending on the number of competitors expected**. Another approach had been initially proposed, where the generic operator market share would be based on Romtelecom's market share. However, following relevant comments from Romtelecom and with due consideration on the specificities of Romania, the definition of the generic operator market share was changed as shown below:

Table 5 – Market share of the fixed generic operator

Market share	Base scenario
National backbone	25%
Regional backbone	33%
Local/Metro network where RCS&RDS is	50%
Local/Metro network where RCS&RDS is not	100%

Source: ANCOM Conceptual Framework, July 2012

Considering the above assumptions for the generic operator, the outcome of pure LRIC costs is as follows:

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Table 6 - Cost of fixed call termination services of the generic operator

c€/min		2013	2014	2015
F	Generic operator	0.15	0.15	0.15

Source: TERA Consultants

1.1.3 Assessment on a hypothetical glide path

Glide-paths to setting cost oriented charges have been considered common in the regulatory practice, the most common reasons underlying their use being associated with the need to allow operators to gradually adjust their business plans and/or to avoid too abrupt disruptions in the market.

In accordance with the 2009 EC recommendation, many NRAs have applied a glide path for MTRs and FTRs in order to reach the target pure LRIC values. However, with the deadline of implementing the stated recommendation approaching, the observed length of glide paths has considerably shortened.

This section deals with possible durations of a hypothetical glide path, taking into account the specific context of Romania and the level of current rates in place (see section 1.1.3.1).

The main purpose of the analysis is to allow the assessment of the magnitude of the impact on operators' business plans and perform a welfare analysis of the proposed measures. The report then specifies what could be a slope of an eventual glide path (see section 1.1.3.2).

1.1.3.1 Duration of the glide path

According to a benchmark of different European countries that implemented pure LRIC, the duration of the glide path for MTRs varies between 0.4 year and 2.5 years, with an average of approximately 1.2 year.

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**Table 7 – Benchmark of glide path adopted throughout European countries[51] that
implemented pure LRIC of MTR**

Country	Decision date	Deadline	Glide path Duration (years)
FR	mai-11	janv-13	1,7
BE	juin-10	janv-13	2,5
IT	nov-11	juil-13	1,7
PT	mai-12	janv-13	0,7
ES	avr-12	juil-13	1,3
IE	nov-12	juil-13	0,7
UK	juin-11	avr-13	1,8
BG	févr-13	juil-13	0,4
CZ	déc-12	juil-13	0,6
Average			1,2

Source: NRAs' Decision, European Commission

In its 2009 Recommendation, the EC emphasized that:

> *"NRAs should ensure that termination rates are implemented at a cost efficient, symmetric level by 31 December 2012"[52].*

However, due to specific constraints, some NRAs postponed the final step to pure LRIC for MTRs at latest to 1 July 2013. The European Commission estimated that this additional delay was justified and therefore agreed on the glide path proposed:

> *"…the Commission appreciates that regulators are confronted with the need to strike a balance between protecting consumer welfare and avoiding a disruptive impact on the operators. To that end, the Commission acknowledges that NRAs have a certain margin of discretion, which could allow them to delay to a degree the introduction of fully cost-oriented rates."[53]*

Hence, this suggests that the EC accepts an additional delay for the implementation of pure LRIC rates. But such duration should take into account the following issues:

- In Romania the move from the current rates to those defined by the pure LRIC methodology introduces a considerable reduction.

- The minimum glide path duration observed in other countries was 0.4 year in Bulgaria which means that NRAs did not considered that it may be appropriate to impose reductions of termination rates in less time.

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[51] FR: France, BE: Belgium, IT: Italy, PT: Portugal, ES: Spain, IE: Ireland, UK: United Kingdom, BG: Bulgaria, CZ: Czech Republic

[52] Source: Source: EC Recommendation on the Regulatory Treatment of Fixed and Mobile Termination Rates in the EU, 7 May 2009, Article 11

[53] Source: European Commission letter reference C(2012) 3056; SG-GREFFE (2012) D/7685 dated 30 April 2012

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- If the new rates were applied today, this would already exceed the 6 months delay allowed by the EC.

- At the same time a glide path of 1.2 year (i.e. 15 months), as suggested by the average of the benchmark, would be too long and would not encourage operators for long term efficiency (This scenario is designated thereafter as the 'benchmark scenario'. Please note this is not 'medium' or 'base case' scenario considered in the impact assessment).

In order to take into account the EC's view and the ability of the operators to adjust, the length of the glide path for MTRs could be set so that the pure LRIC level is reached beginning 2014 (i.e. 3 months. This scenario is designated thereafter as the 'medium scenario' or 'base case' scenario). The choice on the need and length of glide path is strengthened through the analysis of the quantitative impact on the economic welfare in section 1.1.5.

Figure 15 – Evolution of MTRs depending on the different scenario considered
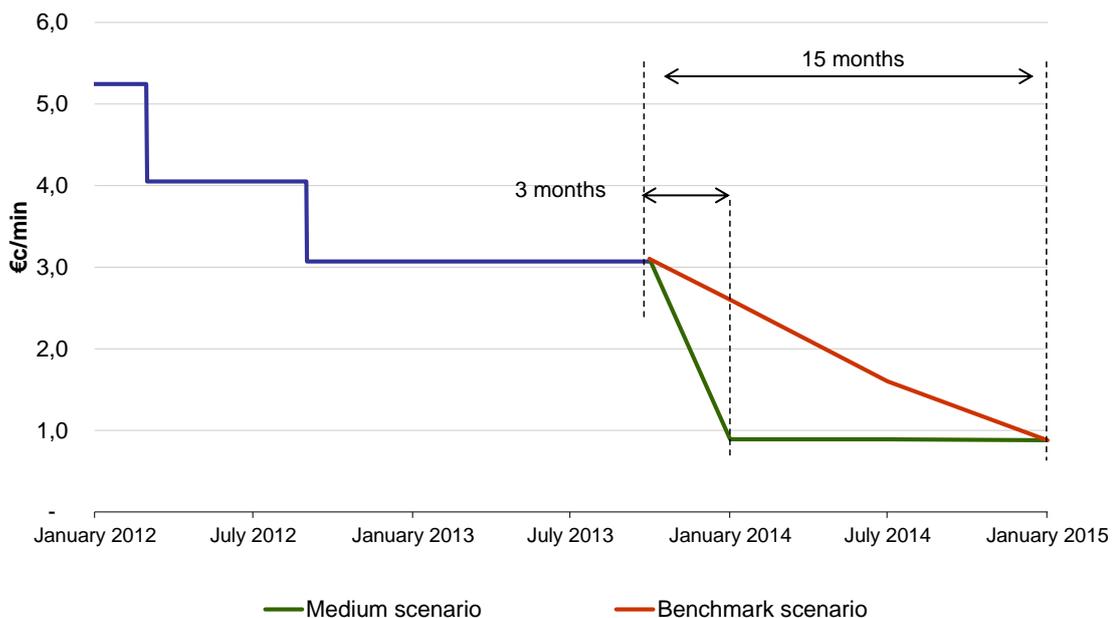
Source: TERA Consultants

With regards to fixed networks, at the date of the publication of this report, four European countries[54] have taken a final decision resulting in the implementation of bottom-up pure LRIC FTRs: France[55], Ireland[56], Malta[57] and Bulgaria[58] while a

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[54] NPT in Norway (that does not belong to Europe) also implemented a glide path for the migration from full TDM to full NGN rates. NPT chose in its analysis a five years glide path, from 2011 to end 2015.

[55] As a result of its third cycle of market review, ARCEP sets a glide path from 1 October 2011 to 1 January 2013. Source: ARCEP Decision n°2011-926

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significant number of other countries such as Austria, Italy, Portugal, Netherlands and the UK currently work on the development of similar models[59]. Corresponding NRAs, ARCEP in France and ComReg in Ireland implemented a glide path for the migration from a full TDM to a full NGN operator, which coincide with the glide-path towards pure LRIC. The length of these glide paths is respectively 1.5 year and 0.7 year. In some particular cases however (e.g. Ireland), a gradual transition to NGN has been considered acceptable, provided it is realised under pure LRIC cost base.

Table 8 – Benchmark of glide path adopted throughout European countries that implemented pure LRIC of FTR

Country	Decision date	Deadline	Glide path Duration (years)
FR	juil-11	janv-13	1,5
IE	nov-12	juil-13	0,7
BG	févr-13	juil-13	0,4
MT	déc-12	juil-13	0,5
Average			0,8

Source: NRAs' Decision

The EC allowed putting in force pure LRIC rates at latest by beginning July 2013 which means that the duration of the glide path should take into account this exemption. As for MTRs, the length of the glide path shall not hinder the promotion of efficiency but shall also not be too short so that operators may be in a position to adjust their businesses. However, based on the most recent notifications[60], while the Commission recognizes NGN is in principle the efficient technology for FTR, longer glide-paths towards full NGN have been considered acceptable as long as they are based on pure LRIC. At the same time, it is to be noted that the reduction of FTRs induced by the use of the pure LRIC approach is less important than for MTRs. A glide path of 0.8 year (i.e. 9 months) as suggested by the average of the benchmark may be therefore too long and would not encourage operators for long term efficiency (this scenario is designated thereafter as the 'benchmark scenario').

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[56] ComReg acknowledges that: *"an implementation date of 1 January 2013 would be in line with the 2009 Termination Rate Recommendation. However, ComReg proposed an implementation date of 1 July 2013 for the pure LRIC approach. This was to allow additional time for FSPs and MSPs to implement the proposed price changes."* This additional delay is considered as the duration of the glide path: 0.7 year. Source: ComReg, Voice call termination Rates, 21 November 2012.

[57] Source: MCA, New bottom-up cost model for fixed networks and proposed interconnection prices, 21st December 2012

[58] Source: EC, Case BG/2013/1409

[59] Source: Cullen International

[60] Italy and Germany

Since there are no objective reasons to treat FTR glide-paths different in duration and/or shape to MTR ones, it can be concluded that to the extent a glide path is needed for FTRs, its' the length should be set at the same level as for MTRs. This scenario is also designated thereafter as the 'medium scenario'. The choice on the need and length of glide path is strengthened through the analysis of the quantitative impact on the economic welfare in section 1.1.5 and is consistent with the approach chosen for MTRs.

Figure 16 – Evolution of FTRs depending on the different scenario considered
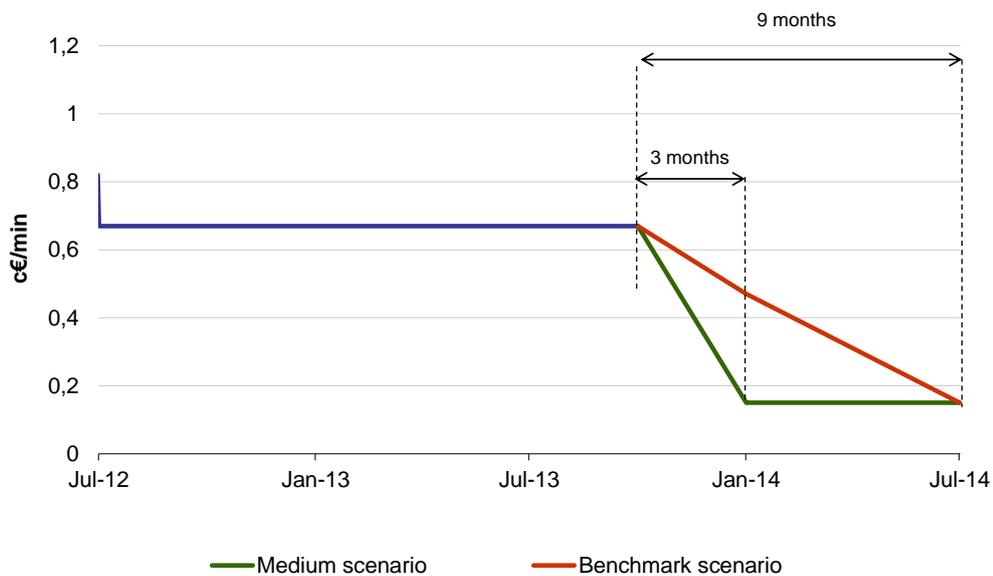
Source: TERA Consultants

1.1.3.2 Shape of the glide path

According to benchmarked countries, the shape of the glide path varies from a country to another. Even if there is a large number of NRAs that applied a linear decrease, there is no clear trend. It mainly depends on the local context, including the calendar of the regulatory decisions.

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Table 9 – Benchmark of MTR cuts adopted throughout European countries

Country	Decision date	Initial MTR (€cent)	Target MTR	Reduction	Deadline	Glide path Duration (years)	1st cut
FR	mai-11	3,00	0,80	-73%	janv-13	1,7	**-33%**
BE	juin-10	4,52	1,08	-76%	janv-13	2,5	**-15%**
IT	nov-11	5,30	0,98	-82%	juil-13	1,7	**-53%**
PT	mai-12	3,50	1,27	-64%	janv-13	0,7	**-21%**
ES	avr-12	4,00	1,09	-73%	juil-13	1,3	**-21%**
IE	nov-12	4,15	1,04	-75%	juil-13	0,7	**-37%**
UK	juin-11	4,43	0,80	-82%	avr-13	1,8	**-32%**
BG	févr-13	6,36	1,17	-82%	juil-13	0,4	**-82%**
CZ	déc-12	4,27	1,06	-75%	juil-13	0,6	**-62%**
Average				-76%		1,2	**-40%**

Source: NRA's decision, European Commission

Figure 17 – Benchmark of the shape of MTRs glide path in European countries
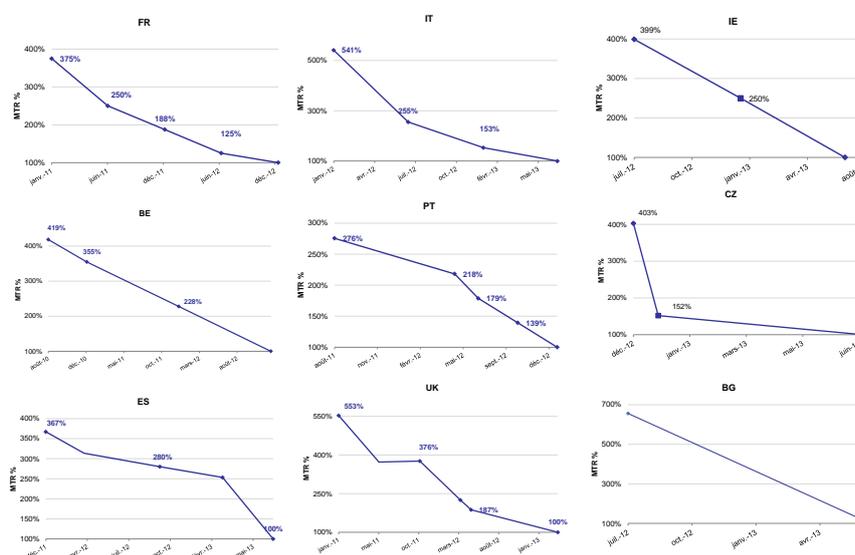
Source: NRA's decision, European Commission

Table 10 – Benchmark of FTR cuts adopted throughout European countries

Country	Decision date	Initial MTR (€cent)	Target MTR	Reduction	Deadline	Glide path Duration (years)	1st cut
FR	juil-11	0,40	0,08	-80%	janv-13	1,5	**-25%**
IE	nov-12	0,38	0,10	-75%	juil-13	0,7	**-18%**
BG	févr-13	0,51	0,26	-50%	juil-13	0,4	**-50%**
MT	déc-12	0,72	0,04	-94%	juil-13	0,5	**-47%**
Average				-74%		0,8	-35%

Source: NRA's decision

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Figure 18 – Benchmark of FTR cuts adopted in France and Ireland
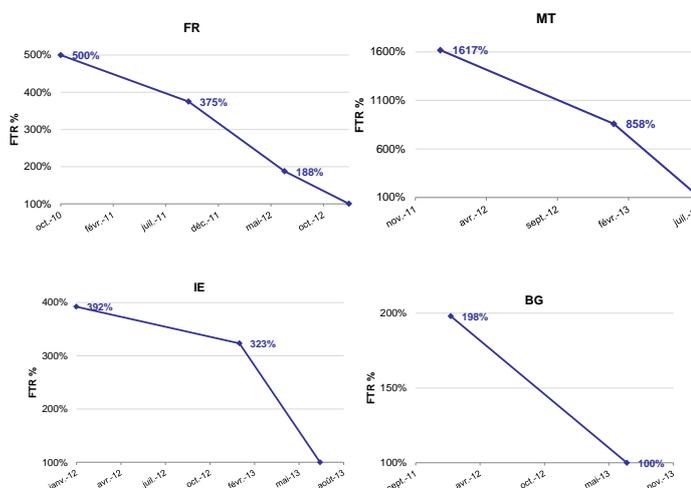
Source: NRA's decision, European Commission

As shown above, experiences in other jurisdictions show that termination cuts above 50% in one step have not been considered too abrupt.

Considering the above mentioned EC 2009 Recommendation, the 2012 Conceptual Framework and the fact that the additional delay allowed by the EC has been already passed, the report recommends the application of a one-step glide path.

1.1.4   Assessment on the tariff differentiation

When setting regulated rates, it is possible to differentiate tariffs between the different technologies used or thanks to the use of gradients.

This section specifies whether ANCOM should apply a technological differentiation (see section 1.1.4.1), a time of day gradient (see section 1.1.4.2) and/or a network interconnection level gradient (see section 1.1.4.3) to FTRs.

1.1.4.1   Technological differentiation

For MTRs, there is no issue related to the technological differentiation of tariffs, as far as it was not the case previously in Romania.

Therefore there should be no technological differentiation of mobile termination rates between 2G and 3G in order to prevent any competitive distortion on the retail market. It is to be noted that NRAs in all European countries adopted the same approach.

For FTRs, in line with the technological neutrality principle, there was also no technological differentiation in the previous round of regulation in Romania.   It is

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therefore believed that tariffs should not be differentiated between voice over PSTN and voice over IP.

It is to be noted that NRAs in Denmark, France, Germany or the Netherlands clearly specified that there shall be no differential at the moment in order to avoid competitive distortions on the retail market.

For the same reasons as in the aforementioned countries, there should be a unique tariff for voice in Romania, irrespective of technology used to provide the service.

1.1.4.2 Time of day gradient

During the last rounds of market analyses, no time of day differentiation has been noticed; although at some point operator have had the opportunity to differentiate should they wish to.

Furthermore, with the advent of large quantities of data services and with the deployment of IP technologies, the role of the time of day gradient for wholesale voice is set to further reduce.

Therefore, there should be no use of a time of day gradient..

1.1.4.3 Network interconnection level differentiation

The previously set FTRs were differentiated between the network interconnection levels:

- Local;
- Regional; and
- National.

This type of tariff differentiation was historically set in order to reflect PSTN network architecture in Romania as well as to provide incentives to alternative operators so that they were in a position to climb the investment ladder. However, voice interconnection is not anymore the service which drives the investment ladder for alternative operators around European countries. Today in Romania, it is rather broadband services or multichannel TV. There is therefore no more relevance to set tariffs at different interconnection levels.

Besides, in an NGN context, all calls transit through the IMS. There is therefore no more sensitivity of costs relative to the network level at which interconnection takes place. This strengthens the fact that there is no more need to differentiate tariffs[61]

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[61] It is to be noted that the model still determines the cost of fixed termination at each network level with the LRAIC+ approach.

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between the different network levels for the generic operator. In France, Malta, Bulgaria and in the Netherlands [62], regulatory authorities removed this type of differentiation.

As a consequence, the network interconnection level differentiation should be removed and there shall be a unique rate for fixed termination.

Based on the pure BU-LRIC calculation and on the above pricing issues analysis, the proposed termination rates for fixed and mobile networks are as follows:

Table 11 – Mobile and fixed call termination rates (2013-2015)

c€/min	As of 1st October 2013	As of 1st January 2014	As of 1st January 2015
FTR	0.67	0.15	0.15
MTR	3.07	0.86	0.84

Source: TERA Consultants

1.1.5   Calculation of the impact on the economic welfare

The impact of the implementation of a new cost standard on the economic welfare is measured by the sum of both:

- Producer surplus which represents the amount that producers benefit from selling at a market price that is higher than what they would have been willing to sell it for; and
- Consumer surplus which represents the amount that consumers benefit from buying at a market price that is lower than what they would have been willing to buy it for.

This section analyses the combination of these two elements expressed in quantitative terms. In the current context, this corresponds to calculating the impact on operators businesses and on the evolution of demand for services.

1.1.5.1   Producer surplus

In this specific case, the producer surplus is determined on the basis of two crucial factors:

- Traffic volume; and

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[62] Source: Commission decision concerning case NL/2010/1079: Call termination on individual public telephone networks provided at a fixed location, C(2010)3765, p.4

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- Termination rates.

For illustrative purpose, when the traffic volume increases from V to V', the gain relative to the producer represents the difference between the two producer surpluses.

Figure 19 – Evolution of the producer surplus[63]
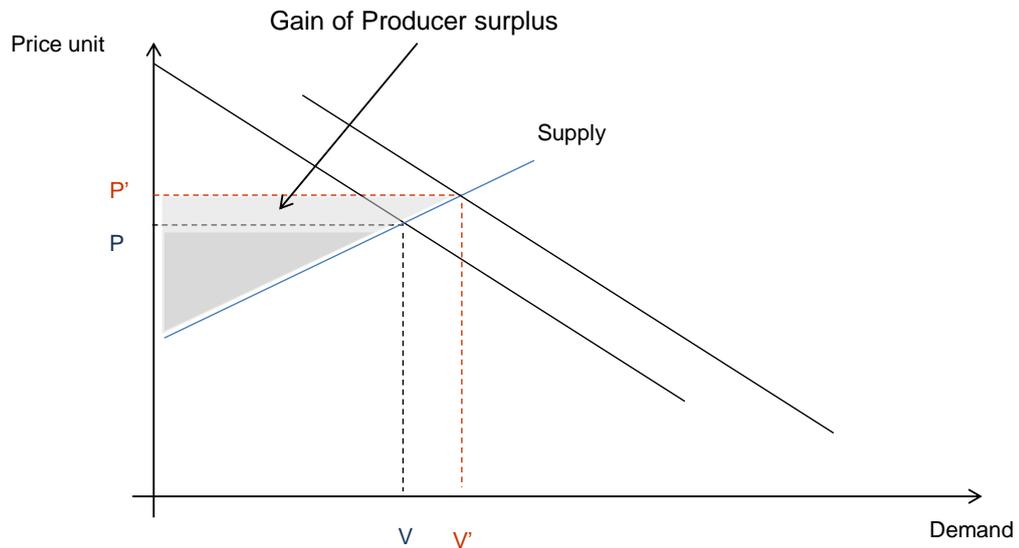
Source: TERA Consultants

Therefore, it is first necessary to estimate flows of traffic and revenues between mobile operators, between fixed operators and between fixed and mobile operators. The flows of traffic considered in this report are relative to the four mobile operators (Vodafone, Orange, Cosmote and RCS&RDS) and to the five largest fixed operators (Romtelecom, RCS&RDS, UPC, Vodafone and Orange).

Due to the significant difference between the level of FTRs and MTRs, it appears that flows of revenues largely benefit to mobile operators.

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[63] In the specific case of the pure LRIC it is simpler than the figure set out, the volume taken into account for the calculation of the producer surplus does not vary: V=V'

Figure 20 – Flows of traffic among operators – 2010

M to M: 5,4 B of min

F to F: 2,1 B of min

Mobile

F to M: 1,2 B of min

M to F: 1,7 B of Min

Fixed
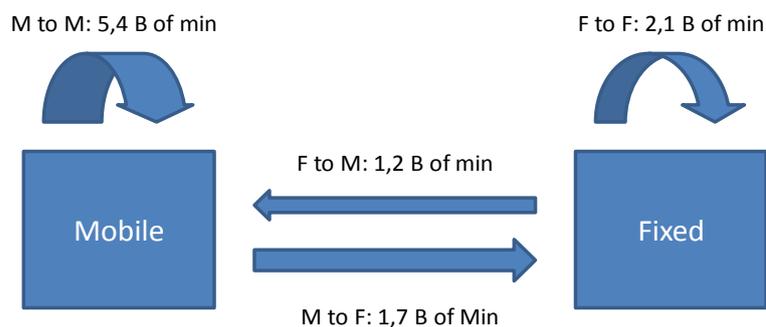
Source: TERA Consultants

Figure 21 – Flows of revenues among operators – 2010

M to M: 288 M of Euros

F to F: 20 M of Euros

Mobile

F to M: 66 M of Euros

M to F: 16 M of Euros
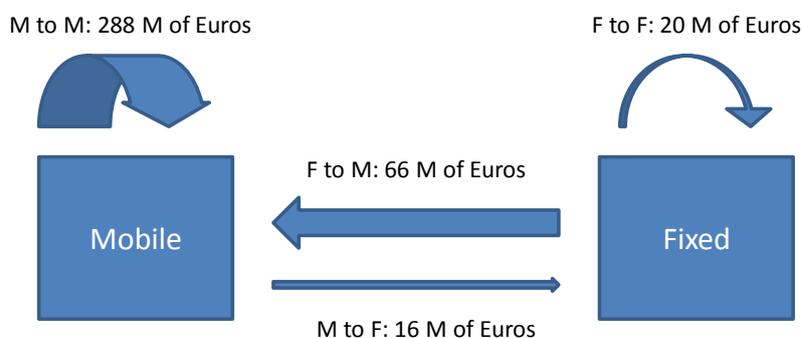
Fixed

Source: TERA Consultants

If the impact of the move to pure LRIC of FTRs and MTRs on the overall business is neutral for the sector, it is not the case when mobile operators are isolated from fixed operators. The impact is even greater at the level of individual operators. Figures below show that there are significant differences in flows of traffic between mobile operators and between fixed operators which explain the different impact at operator level.

Figure 22 – Flows of traffic among mobile operators – 2010
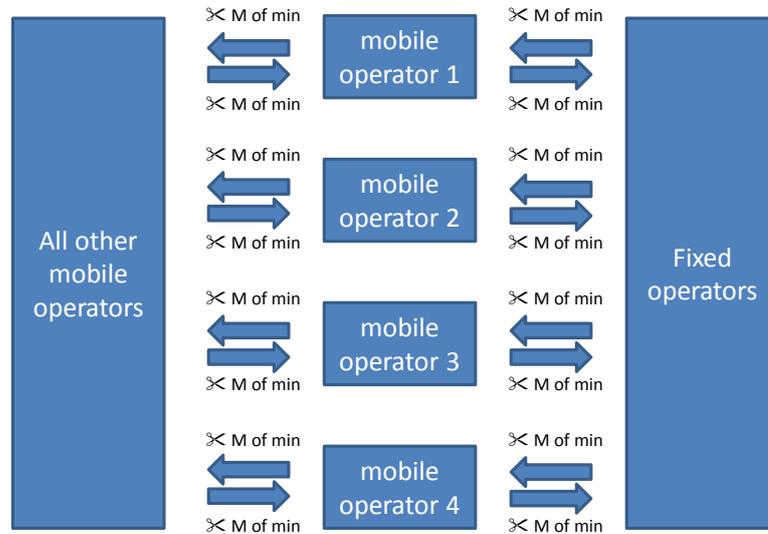
Source: TERA Consultants

Figure 23 – Flows of traffic among fixed operators – 2010
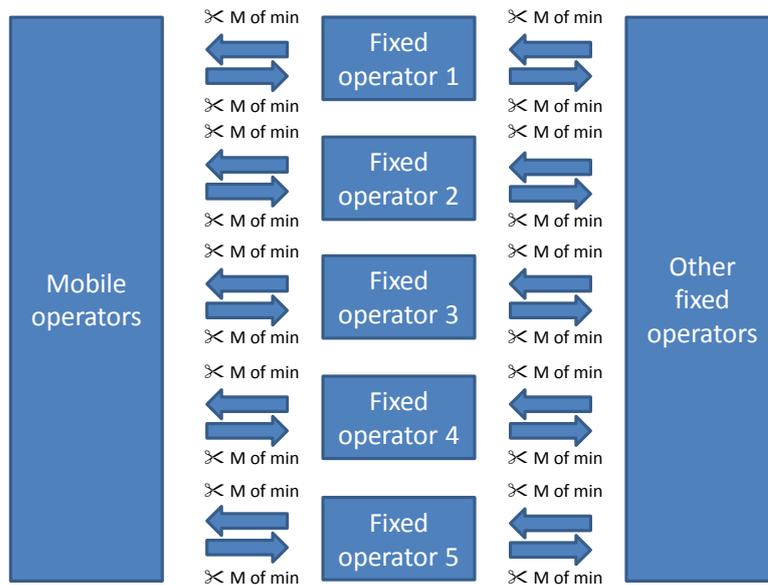
Source: TERA Consultants

For the purpose of elaborating flows of revenues between operators, the report has assumed as counterfactual composite termination rates: 3.91 c€/min for mobile operators and 0.77c€/min for fixed operators[64]. The report also made the assumption that there is a constant traffic distribution over the period of time considered. When

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[64] These TRs have been established based on 2012 rates, irrespective of the market share of each operator.

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multiplying relevant MTRs and FTRs to these volumes of minutes, it indicates some differences in the net flows of revenues between mobile operators and between fixed operators.

Figure 24 – Flows of revenues among mobile operators (2010 traffic and 2012 TRs)
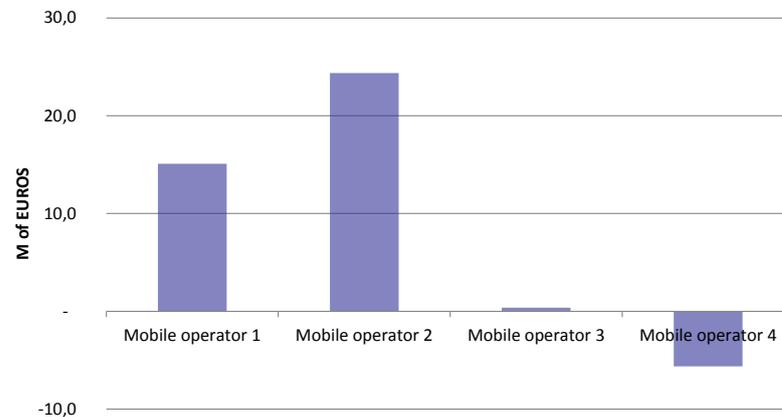
Source: TERA Consultants

Figure 25 – Flows of revenues among fixed operators (2010 traffic and 2012 TRs)
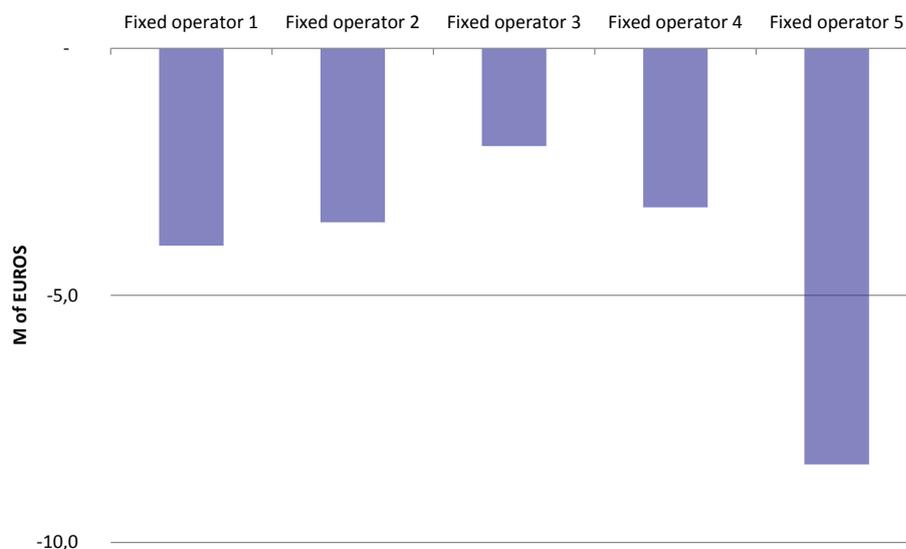
Source: TERA Consultants

Once these results are set out, it is necessary to determine the evolution of the producer surplus between 2013 and 2015 for the whole industry and analyse whether the implementation of the pure LRIC approach has a positive impact.

As set out above, the crucial factors for the calculation of the producer surplus are as follows:

- The volume of incoming and outgoing traffic of each operator between 2013 and 2015.

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o As forecasts provided by operators are not perfectly consistent with each other (for example, incoming traffic volume from operator 1 to operator 2 should correspond to outgoing traffic volume from operator 1 to operator 2), it has been necessary to adjust these forecasts for the purpose of elaborating the producer surplus more precisely (this would have almost no impact on the economies of scale of the operators).

- The level of termination rates to be implemented on the fixed and mobile wholesale termination market between 2013 and 2015.

When considering the **medium scenario in relation to the glide path** (3 months), the impact of setting FTRs and MTRs at the pure LRIC leads to:

- A significant decrease of the net surplus of certain mobile operators; and
- The same decrease in the net deficit of all fixed operators which largely benefit from the pure LRIC approach.

Figure 26 – Evolution of the net surplus/deficit of mobile operators – medium scenario

Source: TERA Consultants

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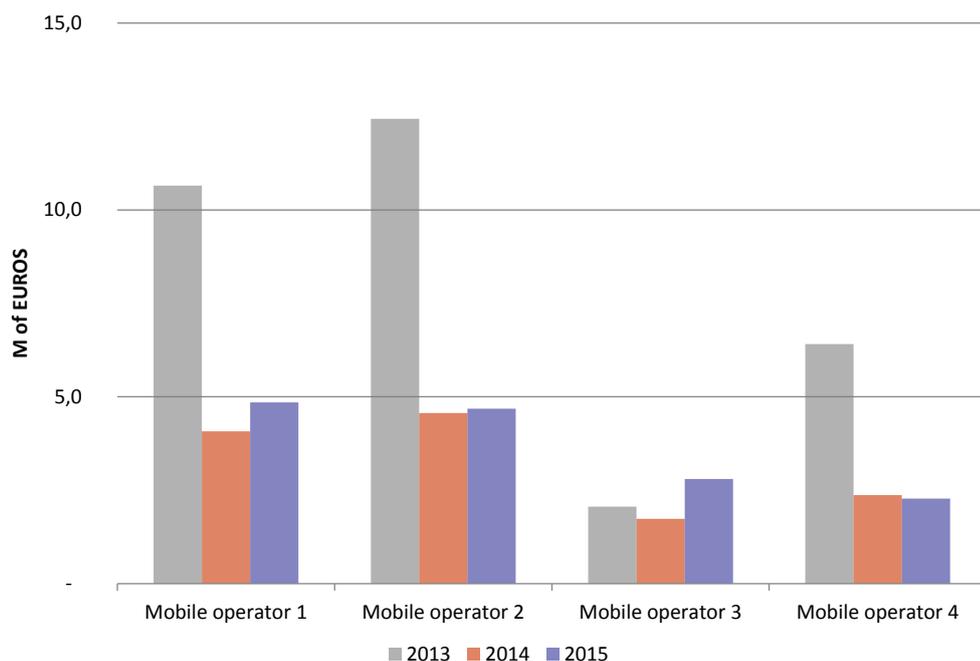
Figure 27 – Evolution of the net surplus/deficit of fixed operators – medium scenario
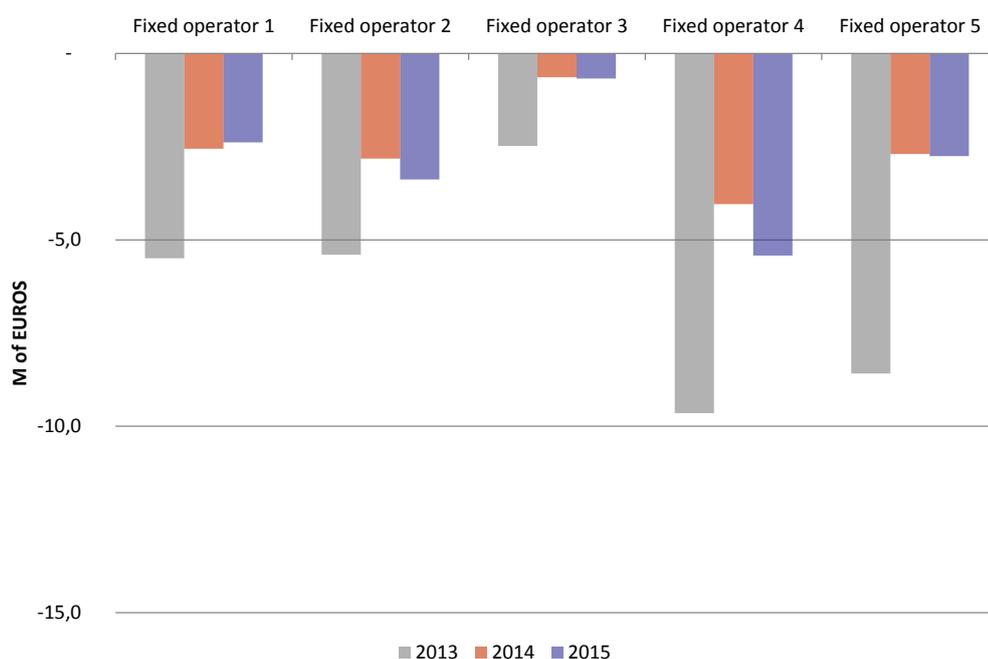
Source: TERA Consultants

However several operators developed activities on both the fixed and mobile markets. It is therefore necessary to look at the situation of each stakeholder[65], by summing net surplus/deficit of mobile and fixed activities of each operator. The outcome of this analysis is that:

- at the overall level the producer surplus is fairly null for the industry when introducing the pure LRIC;

- The net surplus decreases for only three operators. The implementation of the pure LRIC approach for MTRs and FTRs benefits to all other operators. The analysis stresses out that:
    - Operator 1: net revenues decrease from 1.0M€ in 2013 to -0.6M€ in 2015 which represents a decrease of 0.1% of the 2011 total turnover per year between 2013 and 2015. The associated decrease of gross revenues (59M€) represents approximately 3.6% of the 2011 total turnover per year over the same period.
    - Operator 2: net revenues decrease from 3.9M€ in 2013 to 1.8M€ in 2015 which corresponds to a decrease of 0.1% of the total turnover per year between 2013 and 2015. The associated decrease of gross revenues (56M€) also represents approximately 3.9% of the 2011 total turnover per year between 2013 and 2015.

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[65] The number of stakeholder to be considered in this report is 6: Vodafone, Orange, Cosmote, RCS&RDS, Romtelecom and UPC,

o Operator 3: net revenues decrease from 6.4M€ in 2013 to 2.1M€ in 2015 which represents a decrease of 0.6% of the 2011 total turnover per year between 2013 and 2015. In this case, the associated decrease of gross revenues (53M€) is slightly higher but remains limited and represents a decrease of approximately 7.1% of the 2011 total turnover per year over the same period.

Figure 28 – Evolution of the net surplus/deficit of all stakeholders – medium scenario
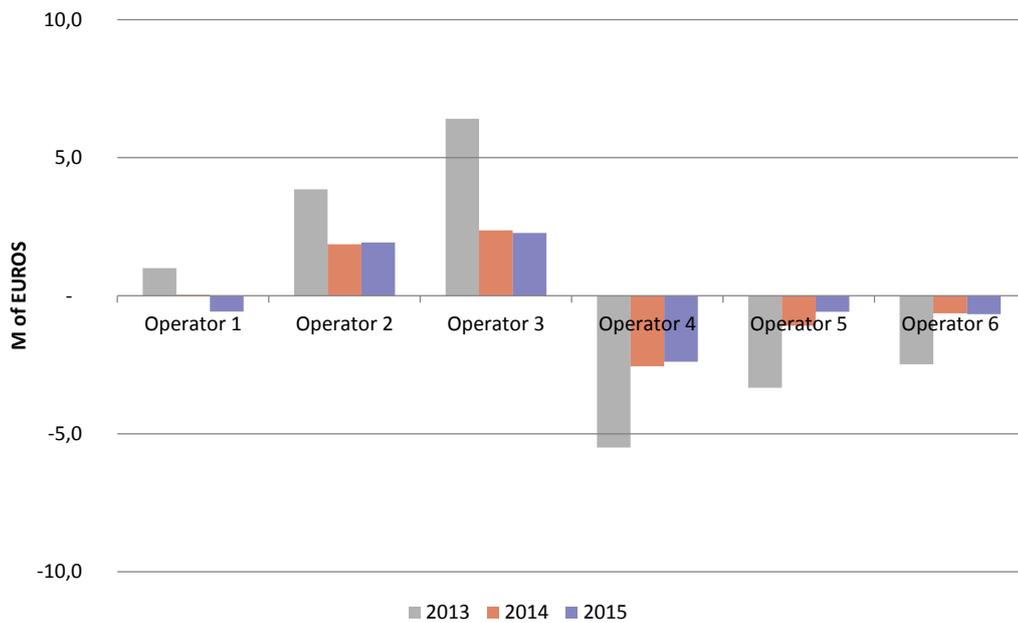
Source: TERA Consultants

In light of the comparison of reduced net revenues with total revenues, it appears that the impact of the implementation of the pure LRIC approach with the medium scenario is limited on operators' businesses when looking at each operator, contrary to what operators generally suggest.

When considering the **benchmark scenario in relation to the glide path** (9 months for FTR and 15 months for MTR), the impact of the implementation of the pure LRIC approach leads to delay the decrease of the net surplus of mobile operators. The decrease of the net deficit of fixed operators would also take much more time.

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Figure 29 – Evolution of the net surplus/deficit of mobile operators – benchmark scenario
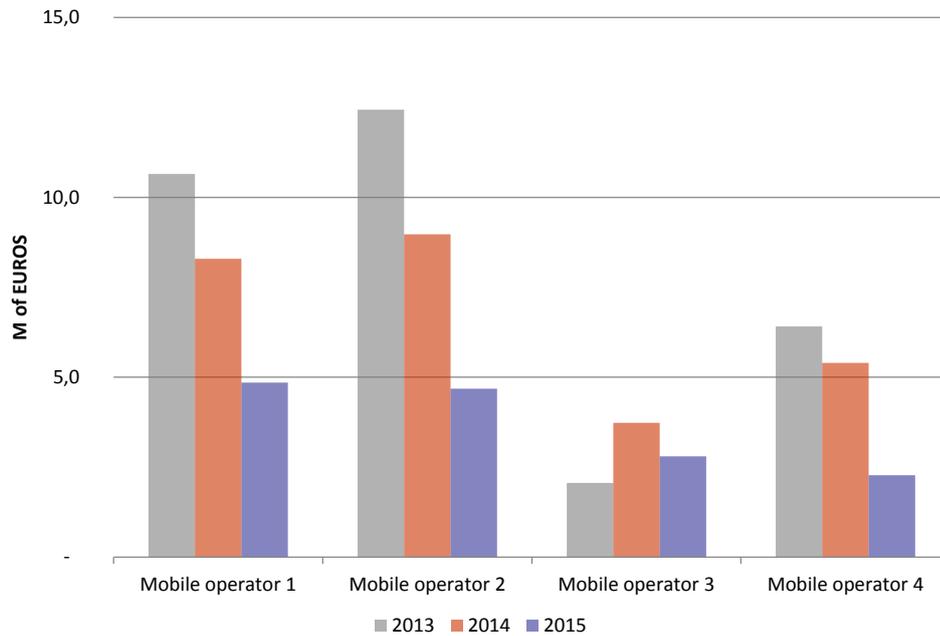
Source: TERA Consultants

Figure 30 – Evolution of the net surplus/deficit of fixed operators – benchmark scenario
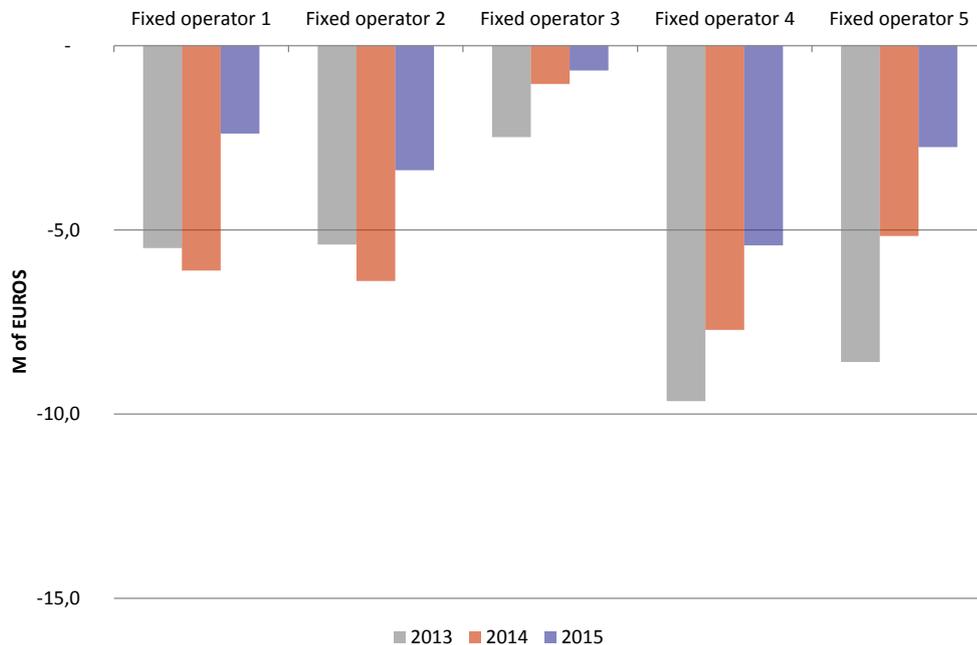
Source: TERA Consultants

When summing mobile and fixed activities of the different stakeholders, the outcome is as follows:

- At the overall level, the producer surplus remains fairly null for the industry.

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- For Operator 1 to 3, the net surplus decreases on a slightly lower trend compared to the medium scenario. It enables them to save 5.8M€ over 2013-2015 compared to the medium scenario.
- On the contrary, for Operator 4 to 6 the decrease of their net deficit is more tighten and they have to support an additional charge of 5.8M€ over 2013-2015 compared to the medium scenario.

Figure 31 – Evolution of the net surplus/deficit of all stakeholders – benchmark scenario
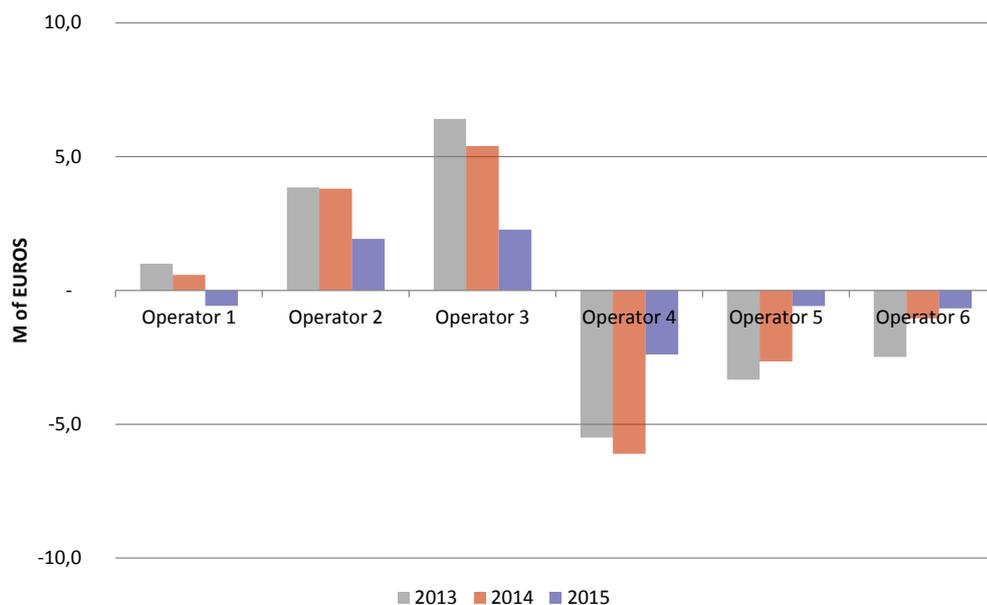
Source: TERA Consultants

The impact of the implementation of the pure LRIC approach on operator's businesses is more limited for certain operators in the benchmark scenario compared to the medium scenario whereas other operators will have to support an additional charge.

1.1.5.2 Consumer surplus

In order to assess the economic welfare, it is also necessary to determine the consumer surplus which corresponds to the difference between the total amount that consumers are willing and able to pay for a good or service (indicated by the demand curve) and the total amount that they actually do pay (*i.e.* the market price).When the market price decreases from P to P' the gain relative to the consumer represents the difference between the two consumer surpluses.

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Figure 32 – Gain of consumer surplus
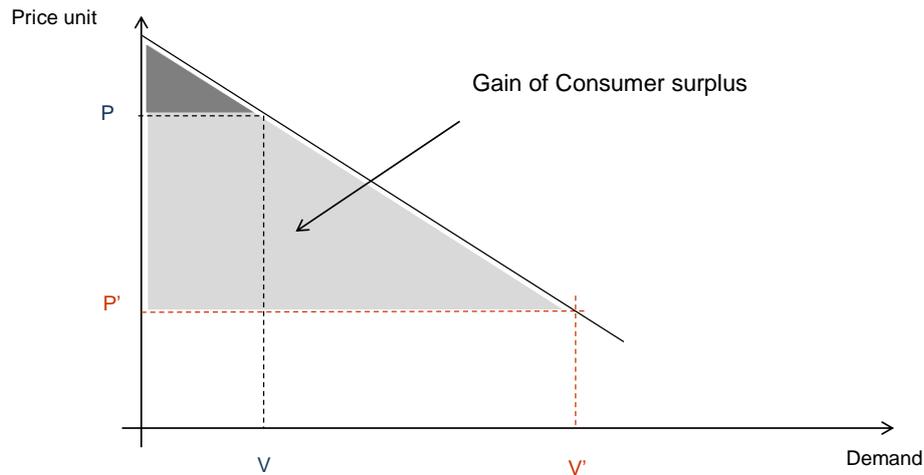
The price per mobile minute and per fixed minute considered for the year 2012 respectively rises up to 0.03 €/min[66] and 0.02€/min[67]. The evolution of these prices is then calculated on basis of:

- The elasticity of FTR vs. retail price (0.2)[68]; and
- The elasticity of MTR vs. retail price that has been previously used by ANCOM[69] (1.00).

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[66] Source: Wireless Intelligence data extracted from Vodafone's answer to the cost calculation consultation

[67] Source: average tariff of retail offers proposed by Romtelecom for voice only.

http://www.romtelecom.ro/asistenta/asistenta-telefonie/voce-simplu

[68] Source : Regulating mobile call termination, The Vodafone Public Policy Series Number 1, p.8

[69] Source: http://www.ancom.org.ro/alte-studii_4588

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Figure 33 – Evolution of mobile retail prices
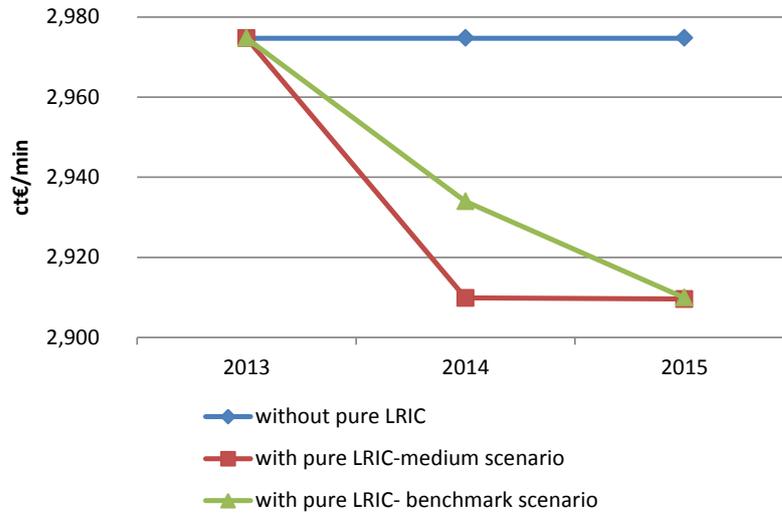
Source: TERA Consultants

Figure 34 – Evolution of fixed retail prices
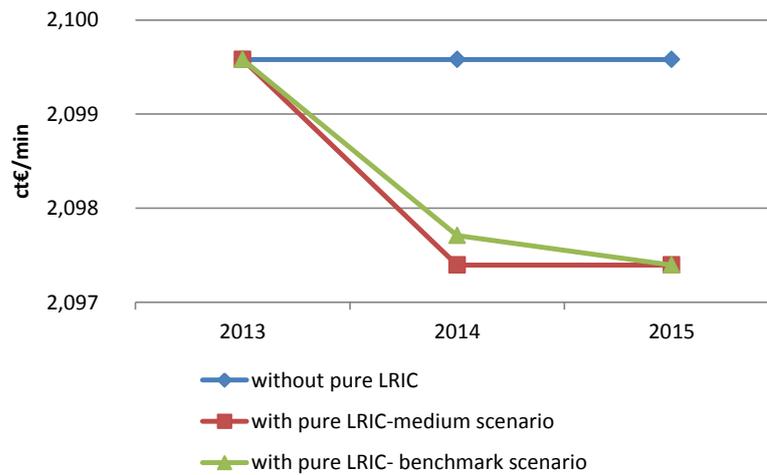
Source: TERA Consultants

It has been also considered that the level of traffic demand, taken into account in the graphs above for the purpose of elaborating the producer surplus, did not take into account the impact of the move of termination rates toward pure LRIC. Being aware that pure LRIC does not contribute to increase of volumes of on-net traffic and thanks to the elasticity of demand vs. retail price that has been established by the French competition Authority[70] (-0.63) for the mobile market, it has been then possible to determine the appropriate level of outgoing traffic. It is to be noted that the level of this

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[70] Source: French Competition Authority, June 2011,

 http://www.autoritedelaconcurrence.fr/doc/ca3_30juin11_mobiles.pdf

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data is very similar to the level considered as "intermediary" by the economist Nicolas Curien[71] between all the economic studies already published on that topic. As there is no data available for the fixed market it has been considered the same level of elasticity.

Figure 35 – Evolution of outgoing traffic to other mobile operator
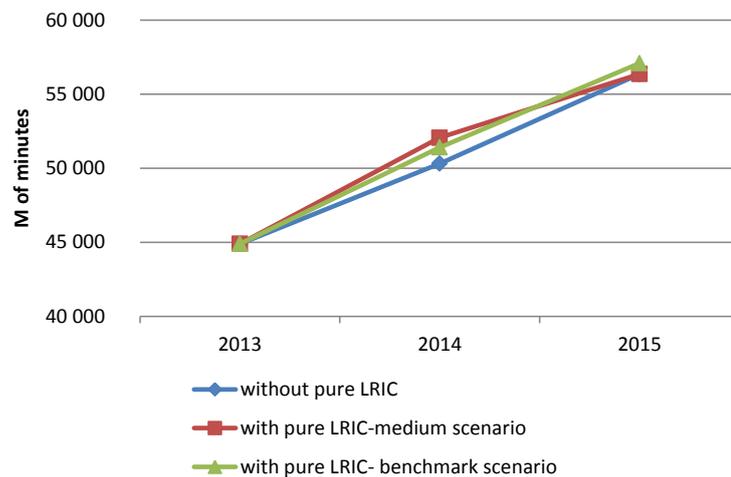
Source: TERA Consultants

Figure 36 – Evolution of outgoing traffic to other fixed operator
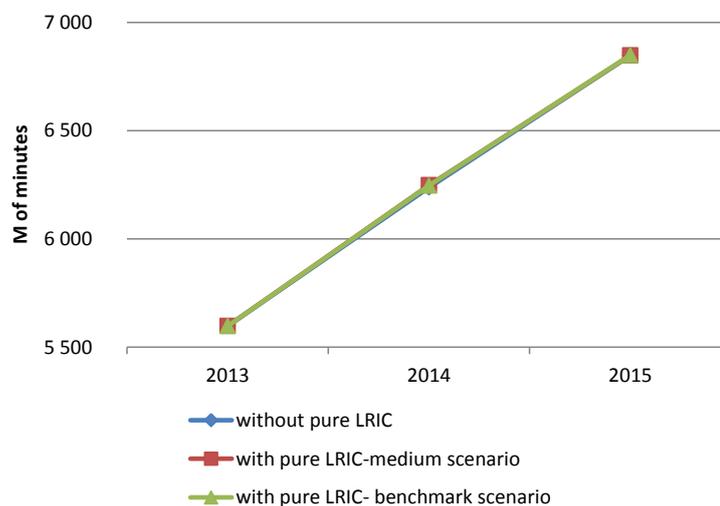
Source: TERA Consultants

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[71] Source: N. Curien, Différenciation tarifaire on-net/off-net : nouvelle approche théorique et modèle de simulation, « Nous ferons ici la valeur absolue de l'élasticité du trafic total sortant au prix all-net en 2003 à un niveau intermédiaire", le même pour chaque opérateur, soit -0;5. » p.37 http://ncurien.fr/images/PDF/Onoffnet.pdf

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The gain in consumer surplus is then determined on the basis of the following elements:

- fixed and mobile retail prices set out above;
- traffic volume with and without pure LRIC;
- a social discount factor: 5.5%[72]

Table 12 – Gain of consumer surplus 2013-2015

M€	Medium scenario	Benchmark scenario
Gain of consumer surplus	15.85	2.35
- Mobile	*15.79*	*2.31*
- Fixed	*0.05*	*0.04*

Source: TERA Consultants

The impact of the move toward pure LRIC is therefore much more positive in the medium scenario which highlights 15.85M€ gain of consumer over 2013-2015.

1.1.5.1 Economic welfare

As specified above, the economic welfare is determined by summing the consumer surplus and the producer surplus.

As specified above, at the overall level the producer surplus is fairly null for the industry and there is no major financial issue for operators in Romania with the implementation of the pure LRIC approach.

The economic welfare is therefore limited to the gain of consumer surplus which is the most favourable in the medium scenario. The move towards pure LRIC should be therefore applied on the basis of the medium scenario.

Table 13 – Economic welfare surplus 2013-2015

M€	Medium scenario	Benchmark scenario
Economic welfare surplus	15.85	2.35

Source: TERA Consultants

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[72] Source: Guide to Cost-Benefit Analysis of Investment Projects, July 2008
http://ec.europa.eu/regional_policy/sources/docgener/guides/cost/guide2008_en.pdf

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1.2 Fixed call origination service

This section specifies how the level of fixed call origination rates shall be set.

The report analyses which cost standard shall be used in order to set regulated tariffs (see section 1.2.1). Then it determines whether tariffs shall be differentiated or not (see section 1.2.2). Finally, it explains how common costs related to fixed termination but not recovered anymore with pure LRIC are allocated to fixed origination rates (see section 1.2.3).

1.2.1   Assessment of the cost standard

The 2009 EC Recommendation does not provide direct guidance on the cost standard to be used for the setting of fixed origination rates, however it explicitly states that the origination service should not be part of the same increment as the termination service:

> *"From the traffic-related costs only those costs which would be avoided in the absence of a wholesale call termination service being provided should be allocated to the relevant termination increment. These avoidable costs may be calculated by allocating traffic- related costs first to services other than wholesale call termination (e.g. call origination [emphasis added], data services, IPTV, etc.) with only the residual traffic-related costs being allocated to the wholesale voice call termination service."[73]*

Call origination does not present the characteristics of being a two-way tariff in a double sided market. In case of this service, the utility is not shared between two parties, therefore no market failure which needs to be addressed under a narrow definition of the relevant increment.

In accordance with the above, the efficient cost of the wholesale call origination service shall be calculated with the LRAIC+ methodology.

1.2.2   Assessment on the tariff differentiation

As for termination rates, the report determines if there is a need to differentiate fixed call origination rates between technologies used (see section 1.2.2.1), between the time of day (see section 1.2.2.2), between the network interconnection level (see section 1.2.2.3) and between the different origination services (see section 1.2.2.4).

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[73] Source : EC Recommendation on the Regulatory Treatment of Fixed and Mobile Termination Rates in the EU, 7 May 2009, Annex

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1.2.2.1 Technology differential

Although fixed operators do not all provide fixed termination services on the basis of the IP technology exclusively, the associated target rate is set according to the generic operator which corresponds to a full NGN operator. This underlines that a high efficiency standard is recommended for FTR. At the same time, wholesale call origination is provided under a regulated basis only by Romtelecom's TDM network while the target architecture is NGN. Therefore, it is necessary to determine on which technology – NGN or PSTN or a mix of the two – shall be based fixed origination rates.

The choice of a unique tariff based on a mix of the cost incurred by both technologies for this service (after the cost allocation between technologies) would have the advantage to be technologically neutral. This mix should be based on the forward looking distribution of originated minutes between technologies so this may promote the deployment of IP technology (meaning that the percentage of IP originated minutes would be continually higher than the one observed in the past year during the migration period). This mix shall be nevertheless fair and reasonable so that it does not distort the market (meaning that the percentage of IP originated minutes shall not be too low so that it destabilizes the market).

The main issue with this approach is that this may induce higher costs compared to the IP technology whereas it is illegitimate for alternative operators to pay for Romtelecom's historic inefficiencies. Nevertheless, ANCOM is of the view that it may have a relatively small impact as the proportion of minutes originated over IP technology will significantly increase in the very near future. The proportion of costs in relation to the PSTN network will therefore be minor.

Another pricing approach would have been to set separate tariffs for each technology in order to provide a strong signal for the promotion of efficiency. However in such a case, alternative operators would ask for the lowest tariff, i.e. origination based on IP network. The risk of such approach is that Romtelecom would not be in the position to achieve the provision of this service to all its customers because it does not necessarily have the capacity for this in a short timeframe and because the applicability of differentiation according to the technology would be questionable in terms of implementation and monitoring. This would also lead Romtelecom not to recover its costs. This approach is therefore not appropriate.

The above analysis suggests therefore the use of a mix of the cost incurred by both technologies for the setting of origination rates. This pricing solution best promotes the regulatory objectives. It is assumed that the proportion of IP originated minutes rises from 15% in 2013 up to 51% in 2015.

Table 14 – Distribution of originated minutes over 2013-2015

%	2013	2014	2015
IP originated minutes	15%	31%	51%
PSTN originated minutes	85%	69%	49%

Source: TERA Consultants

1.2.2.2 Time of day gradient

The previously set wholesale origination rates were not differentiated between peak and off-peak calls.

This should not change and there should be no use of a time of day gradient.

1.2.2.3 Network interconnection level gradient

In the previous regulatory round, origination rates were differentiated between the different network interconnection levels:

- Local;

- Regional; and

- National

As for termination, this type of tariff differentiation was historically set in order to reflect PSTN network architecture in Romania as well as to provide incentives to alternative operators so that they were in a position to climb the investment ladder. However, voice interconnection is not anymore the service which drives the investment ladder for alternative operators around European countries.

Besides, in an NGN context, all calls transit through the IMS. There is therefore no more sensitivity (or very low) of costs relative to the network level at which interconnection takes place. Even if origination rates should be based on a mix of PSTN and IP, it is considered that there should be no more differentiation of origination rates between interconnection network levels.

The report therefore recommends ANCOM setting a unique tariff for origination.

1.2.2.4 Service differential

Four types of origination service are provided by Romtelecom:

- (a) Fixed origination services from subscribers access lines or public payphones, using carrier selection/pre-selection;

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- (b) Calls to a national non-geographic number 0ZAB=0808 (numbers for indirect access to services), irrespective of national or international called number;

- (c) Call origination services to non-geographic national numbers 0ZAB=0800 (free access calls for caller) and to 116(xyz) numbers (harmonized social services numbers); and

- (d) Origination self-supply services, irrespective of used technology or transmission environment, including origination services using managed VoIP technology.

No methodological change in the costing approach as compared with the previous regulatory decisions in Romania is needed that is to say that the four types of origination services are priced as "normal" call origination. The only difference in prices recognized by ANCOM in the past is with regard to any type of calls originated from public payphones. For this specific service, ANCOM stresses out the need to apply a mark-up of 27c€/min[74] in order to recover the local loops associated with public payphones.

Redistribution of some network joint costs which can no longer be recovered from termination is also needed.

1.2.3   Treatment of common costs related to fixed termination

As specified in the above sections, with the use of the pure LRIC approach, FTRs do not recover any more common and overhead costs. The report outlined that these costs should be recovered by all other services, including origination, based on the distribution of the CAPEX related to each service.

The first question that arises is the scope of the total costs to be recovered. Indeed the total amount of these costs can be seen as the multiplication of the difference between pure LRIC rates of the generic operator and LRAIC+ rates of the generic operator either with the total number of wholesale termination minutes or with the total number of wholesale termination plus self-supplied retail termination minutes. For non-discriminatory reasons, the total amount of cost no longer recouped on the call termination rates should be based on the total number of minutes of wholesale plus self-supply termination minutes (e.g. including on-net minutes). This calculation should be made under the same scenario, i.e. generic scenario.

The second question that arises is on which scope of services this amount of cost shall be distributed. Several options are possible: 1) on retail services only 2) on call

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[74] According to RTC's accounting separation 2012, access network transfer charges related to payphones amounts up to 959,000 €. Besides, according to ANCOM the associated number of minutes with regard to origination from public payphones rises up to 3,561,909 min. The mark-up to apply on this specific service therefore amounts to 27c€/min.

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origination, 3) on all network services including self-supplied origination and origination sold to third parties.

As Romtelecom is regulated on fixed services, the first option appears inappropriate since it would favour wholesale operators against Romtelecom. The 2 other options are relatively equivalent. While both the 2nd and 3rd options respect the cost causation principle, it is observed that the 3th approach is the approach that leads to the lowest impact on services. As a consequence, this option is the preferred option

Fixed origination rates are as follows:

Table 15 – Fixed call origination rates

c€/min	As of 1st October 2013	As of 1st January 2014	As of 1st January 2015
(a.1) Fixed origination from subscribers access lines using carrier selection/pre-selection	1,77	1.44	1.26
(a.2) Fixed origination from public payphones	28,77[75]	28.44	28.26
(b) Calls to a national non-geographic number 0ZAB=0808 (numbers for indirect access to services), irrespective of national or international called number;	1,77	1.44	1.26
(c) Call origination services to non-geographic national numbers 0ZAB=0800 (free access calls for caller) and to 116(xyz) numbers (harmonized social services numbers)	1,77	1.44	1.26
(d) Origination self-supply services, irrespective of used technology or transmission environment, including origination services using managed VoIP technology	1,77	1.44	1.26

Source: TERA Consultants

[75] ✂

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1.3 Transit

This section specifies how ANCOM shall set the level of wholesale transit rates.

The report shortly assesses on which cost standard the model shall be based in order to set the associated tariffs (see section 1.3.1) and then determines whether tariffs shall be differentiated or not (see section 1.3.2). Finally it calculates the impact of such a move on the economic welfare (see section 1.3.4).

1.3.1 Assessment of the cost standard

Similar to the discussion applied for fixed origination, **the LRAIC+ methodology shall be used for the cost calculation of the wholesale transit service.**

1.3.2 Assessment on the tariff differentiation

The report will determine in this section if there is a need for transit rates to be differentiated between the time of day (see section 1.3.2.1) and between the different types of transit service (see section 1.3.2.2).

1.3.2.1 Time of day gradient

The previously set transit rates were not differentiated between peak and off-peak calls.

This should not change and there should be no use of a time of day gradient.

1.3.2.2 Service differential

In the previous regulatory round, transit rates were differentiated between the different network interconnection levels:

- Single transit; and
- Double transit

As for termination and origination, this type of tariff differentiation was historically set in order to reflect PSTN network architecture in Romania as well as to provide incentives to alternative operators so that they were in a position to climb the investment ladder. However, voice interconnection is not anymore the service which drives the investment ladder for alternative operators around European countries.

Besides, in an NGN context, all calls transit through the IMS. There is therefore no more sensitivity (or very low) of costs relative to the network level at which

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interconnection takes place. Even if transit rates could be based on a mix of PSTN and IP, it is considered that there should be no more differentiation between interconnection network levels.

It is therefore recommended setting a unique tariff for national transit.

As the international transit is not a regulated service, its associated cost is presented only for informative purposes.

Therefore, transit tariffs shall be analysed between two types of category:

- National transit; and

- International transit.

1.3.3 Treatment of common costs related to fixed termination

As for origination, common and overhead costs that are not recovered through FTR are partially rebalanced on transit services.

Transit rates are therefore as follows:

Table 16 – Fixed call transit rates (2013-2015)

c€/min		As of 1st October 2013	As of 1st January 2014	As of 1st January 2015
Transit	National Transit	0.14	0.17	0.22
	International Transit	0.13	0.15	0.17

Source: TERA Consultants

1.3.4 Calculation of the impact on the economic welfare

As the cost standard used for this service is the LRAIC+ approach, it is considered that there is no matter of issue for operators' businesses and more specifically for Romtelecom. Besides it is to be noted that 2010 revenues related to this service are very limited in comparison to the 2010 total turnover (0.7%).

As a consequence, it is not necessary to assess the impact on the economic welfare.

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2   Point of Interconnection

This section specifies how the level of tariffs of all the ancillary interconnection services should be set.

The report shortly reassesses on which cost standard these service should be based in order to set the associated tariffs (see section 2.1.1) and then determines the price structure of ancillary services (see section 2.1.2)

2.1.1   Assessment of the cost standard

As detailed In the Conceptual Framework published beginning 2012, ancillary interconnection services are additional services that do not create any additional business overheads.

Besides, these services are two-way services that benefits to both types of operators. Therefore, as recommended by the EC and for the same arguments as the ones used for FTRs and MTRS (see section 1.1.1), the associated tariff should be based on a pure LRIC approach rather than on a LRAIC+ approach in order to avoid any double counting for overheads.

As a consequence, no mark-up for common cost recovery is applied.

2.1.2   Assessment on the tariff

Services provided by operators shall remain with the same price structure as previously (as described in the PoI cost model documentation published in November 2012[76]).

Table 17 – Ancillary interconnection services' rates

#	€	Tariffs
1	Configuration of partner in PoA/PoI	539
2	Reconfiguration of partner in PoA/PoI	526
3	Removal of partner in PoA/PoI	148
4	Installation of port in the switch	276

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[76] Source: http://www.ancom.org.ro/en/formdata-269-53-978

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5	Reconfiguration of port in the switch	247
6	Removal of port from the switch	100
7	Monthly rent of port in the switch	37
8	Other reconfiguration operations - for the 1st circuit	358
9	Other reconfiguration operations - for each of the other circuits in the same reconfiguration operation	61
10	Connection charge for the IC link	89
11	Reconfiguration of the IC link	84
12	Disconnection charge for the IC link	64
13	Capacity reservation	200
13	Increase of capacity	350
14	Decrease of capacity	199
15	Reconnect a suspended service	170
16	Connecting the equipment of 2 operators collocated in Romtelecom's space – connection fee	187
17	Connecting the equipment of 2 operators collocated in Romtelecom's space – monthly fee	0.1
18	STM1 collocation service – monthly fee	1[77]
19	SMT1 port monthly fee	331
20	Administration fee for cascade payment in the transit arrangements	36

Source: TERA Consultants

[77] This has not been calculated in the PoI model but from the access network cost model already developed by ANCOM assuming that the STM1 collocation service uses 1 collocation space and one DDF element

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Also, for leased lines interconnect link, a price per km is kilometre is obtained by using leased lines calculations and the price of E1 and STM1 below 50 km (as calculated in section 3.3.2) and by removing indirect and common costs (as explained in 3.2). Following prices are calculated:

- For E1: €88.5/line/km/month,
- For STM1: €6,408/line/km/month.

This represents a cap above which operators are not allowed to price.

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3   Leased lines

This section deals with the methodology that shall be used by ANCOM for pricing leased lines terminating segments with transmission capacity of up to and including 2Mbps.

The report first details the scope of leased lines considered (see section 3.1), and then assesses the relevant cost standard (see section 3.2). Finally, it specifies how tariff shall be differentiated (see section 3.3).

3.1   Scope of leased lines considered

The scope of leased lines considered throughout the following analysis is only related to the core network. This report neither includes leased lines access network nor customer premises equipment (CPE).

Figure 37 – Leased lines
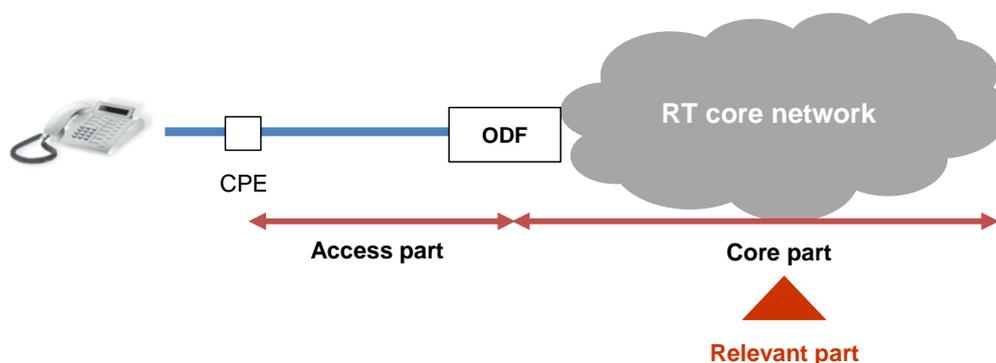
Source: TERA Consultants

3.2   Assessment of the cost standard

The Conceptual Framework stated that the tariff of regulated leased lines shall be set on the basis of the LRAIC+ cost standard:

> *"ANCOM will calculate the cost of the following services on the basis of the LRAIC+ approach: […] elements of leased lines terminating segments with transmission capacity of up to and including 2 Mbps (provided through the core network)."*[78]

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[78] Source: ANCOM, Calculation of the costs of efficient provision for some electronic communications services provided at the wholesale level in Romania Phase 1: Conceptual Framework, p.17

The outcome is therefore that leased lines tariffs shall be set on the basis of the LRAIC+ approach. Pure LRIC would lead to cost under recovery because the market for leased lines is not a two-sided market.

3.3 Assessment on the tariff differentiation

In this section, the report determines the opportunity or not to differentiate tariffs depending on the technology used (see section 3.3.1) and on the capacity ordered by alternative operators (see section 3.3.2).

3.3.1 Technology differential

Romtelecom provides the leased lines terminating segments considered here on two different platforms: Synchronous Digital Hierarchy (SDH) technology and Ethernet technology. This raises the question of whether it is relevant or not to differentiate tariffs between the two technologies. Indeed the model calculates the cost per Mbps or per circuit for each platform which enables to determine then the associated tariffs but it is also possible to calculate a weighted average costs for all technologies.

Setting separate tariffs for each technology would show that the level of tariffs of the Ethernet technology is significantly lower than the one of SDH technology. The main arguments in favour of such approach are as follows:

- Alternative operators would have the choice between the two technologies and be in a position to purchase leased lines that best correspond to their needs. Whereas for termination rates the alternative operator does not know the type of technology used by the receiving party, it is not the case anymore for leased lines where the alternative operator knows precisely the technology it has purchased and that is used.
- Alternative operators would subscribe in a larger way to Ethernet leased lines which would then encourage Romtelecom to deploy the Ethernet technology, in order to remain competitive and achieve the objective of the Digital Agenda for Europe.
- This approach would also have the advantage to allow Romtelecom to compete appropriately with operators that deploy the Ethernet technology. Indeed, for illustrative purpose, if a SDH LL costs 100€ whereas the NGN one costs 50€, then the average price would not enable Romtelecom to fight against an alternative operator that would provide only NGN LL at 50€.
- Separate tariffs would avoid over-recovery of costs which may damage competition. Indeed, the goal of regulation is to provide the right signals to the industry so that alternative operators can buy the most efficient technology from a cost and technology point of view. It is to be noted that this approach is currently followed in the mobile market by MVNO which latest arrangements stress out different prices for data using 3G and 4G technology.

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- Finally, this approach has been followed by the vast majority of European countries.

Figure 38 – Approach to cost recovery
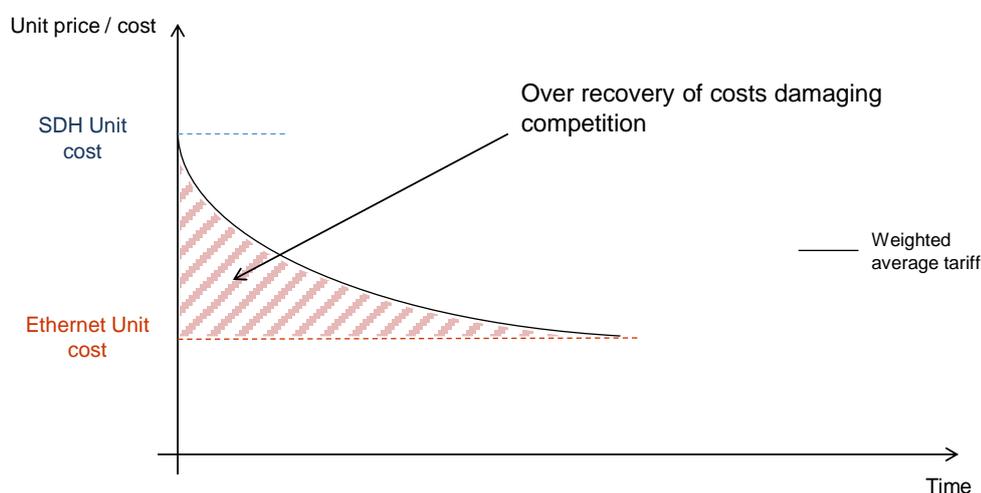
Source: TERA Consultants

However, if this approach would promote efficiency by encouraging Romtelecom to deploy the Ethernet technology, there may be a relevant risk of adverse effects arising from this price distortion which may lead to negative effects on competition.

One other option is to set a unique tariff. This kind of approach could be achieved through the definition of relevant basket of leased lines whose costs would specify the average tariff. In 2009, OFCOM decided to use this methodology[79]. The objective of this charge control was to bring BT's charges in line with an efficient level of costs at the end of the control period. As part of this process OFCOM underlined the importance to understand the efficiency levels that BT can be expected to achieve during the charge control period.

The major issue of such approach is that alternative operators may not be willing to pay for inefficient technology on top of the fact that a mixed price would break the technologically neutrality principle.

With this approach, alternative operators may also think that SDH leased lines and NGN leased lines have same quality of service whereas it is not the case in reality. Indeed SDH technology is based on circuits which capacity is 100% guaranteed while in an NGN context, even if the MPLS technology can provide some types of guarantee, this is never in a circuit mode and bandwidth is always shared with other services (Broadband, IPTV, voice, etc.). The level of QoS is therefore not equivalent.

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[79] Source: OFCOM, leased lines charge control, 2 July 2009.

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Finally, this approach has a high degree of complexity which may not render it clearly understandable by all stakeholders. Indeed, it would be quite difficult to determine:

- The appropriate trend of the move of leased lines toward NGN.
- The mixed price of LL with different speeds. Indeed, from a practical point of view, both technologies do not provided the same range of speeds. The speed available for NGN LL are generally above 2Mbps whereas it is possible to have SDH LL with speeds below 2Mbps. Above 2Mbps, the speed of SDH LL is usually 34 Mbps, 155 Mbps, etc. while NGN speeds are 10, 20, 30, 50, 100, 200, etc. and therefore it would be difficult (not impossible) to calculate a mix price for a 155 Mbps or 34 Mbps.

In order to provide the appropriate signal to the market, the first approach is preferred, which is much less complex than the second one and which also provides right incentives to the different stakeholders, including Romtelecom.

3.3.2   Capacity gradient

For the setting of existing prices, Romtelecom applied a gradient in order to give incentives to use high speeds. Indeed, if the cost per Mbps is similar from a leased line to another it may not be the case from a pricing point of view. Nevertheless, the gradient ensures that costs are recovered.

Figure 39 – Romtelecom's price gradient used for leased lines
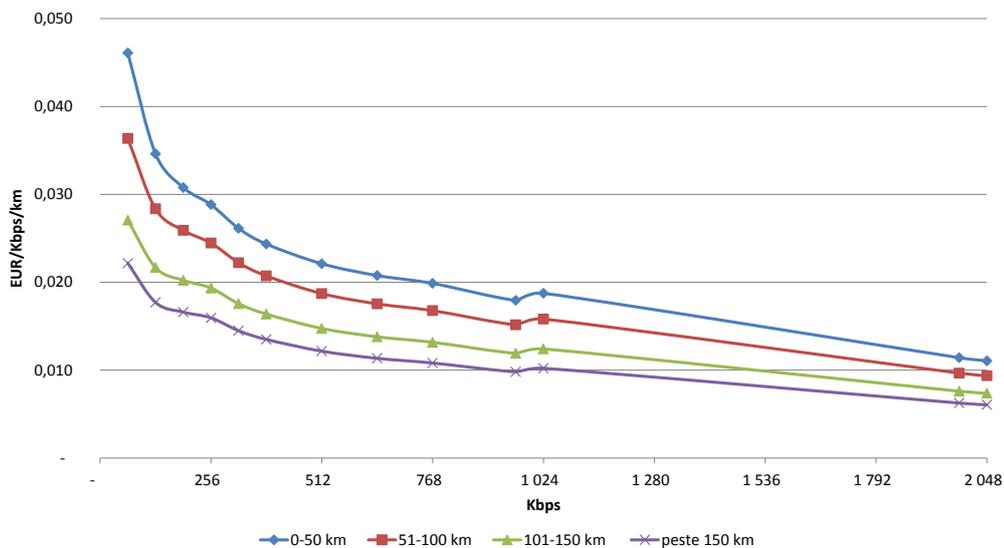
Source: TERA's analysis based on Romtelecom's data

In the Conceptual Framework, ANCOM specified that it may be appropriate to use such pricing tool:

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"In some cases, as e.g. leased lines, the use of gradients may be appropriate for the setting of regulated prices (such as backhaul Ethernet)"[80]

In line with the Conceptual Framework, it is considered that an efficient I price gradient should be implemented. The function that enables to establish this gradient is considered to be polynomial[81] and determined throughout unit incremental tariffs related to 64Kbps and 2 048 Kbps capacities.

Figure 40 – Theoretical price gradient used for leased lines
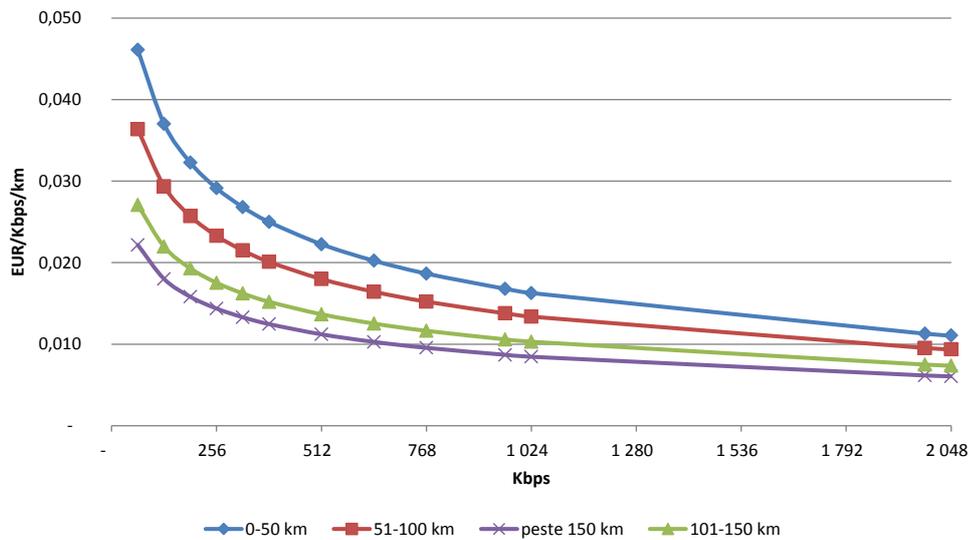
Source: TERA's analysis

Regarding SDH and NGN leased lines below 2Mbps, outputs of the model (under the specific operator scenario) significantly vary over the period 2013-2015. In order to enable operators to have visibility on their businesses, it is recommended to take into account averaged cost over the period for the calculation of the gradient. It is to be noted that even if the number of MPLS leased lines remain low in 2013, the costs allocated are very low in comparison to the situation of SDH leased lines. This is obviously due to the features of the MPLS network which supports and shares many different services and benefits from better economies of scale.

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[80] Source: ANCOM, Conceptual Framework, July 2012, p.104

[81] The function used is: y=a/x^(1/5)+b

Table 18 – Evolution of the cost and the number of SDH and NGN leased lines of up to and including 2Mbps

Source: TERA Consultants

The calculation of new prices must be conducted so that new prices multiplied by volumes of leased lines equal average costs. However, knowledge of the distribution of leased lines (per speed and per length) is necessary to conduct a proper calculation. In absence of information from RomTelecom, following assumptions have been made:

- The average distance of leased lines with distance between 0 and 50 km is assumed to be equal to 10km,
- The average distance of leased lines with distance between 50 and 100 km is assumed to be equal to 75km,
- The average distance of leased lines with distance between 100 and 150 km is assumed to be equal to 125km,
- The average distance of leased lines with distance above 150 km is assumed to be equal to 170km,
- Distribution of leased lines per speed is based on RomTelecom's data,
- Distribution of leased lines per length category is based on RomTelecom's data,
- Leased charging basis is now a price per line and not a price made of two parts (price per port and price per km). This pricing basis is also more simple and more in line with real cost drivers.
- For MPLS leased lines, tariffs are not differentiated between length categories in order to be consistent with tariffs set out by Romtelecom at the retail level.

MPLS leased lines and SDH leased lines tariffs are then as follows:

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Table 19 – MPLS leased lines tariffs

MPLS Speed		Unit	
64	Kbps	*EUR/ Month*	0,98
128	Kbps	*EUR/ Month*	1,57
192	Kbps	*EUR/ Month*	2,05
256	Kbps	*EUR/ Month*	2,47
320	Kbps	*EUR/ Month*	2,85
384	Kbps	*EUR/ Month*	3,19
512	Kbps	*EUR/ Month*	3,79
640	Kbps	*EUR/ Month*	4,31
768	Kbps	*EUR/ Month*	4,77
960	Kbps	*EUR/ Month*	5,37
1 024	Kbps	*EUR/ Month*	5,56
1 984	Kbps	*EUR/ Month*	7,50
2 048	Kbps	*EUR/ Month*	7,60

Source: TERA Consultants

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Table 20 – SDH leased lines tariffs

SDH Speed		Unit	0-50 km	51-100 km	101-150 km	above 150 km
64	Kbps	EUR/ Month	145	856	1062	1183
128	Kbps	EUR/ Month	232	1383	1724	1921
192	Kbps	EUR/ Month	304	1815	2271	2531
256	Kbps	EUR/ Month	366	2192	2751	3066
320	Kbps	EUR/ Month	421	2530	3183	3549
384	Kbps	EUR/ Month	471	2838	3578	3991
512	Kbps	EUR/ Month	559	3387	4288	4783
640	Kbps	EUR/ Month	635	3868	4915	5484
768	Kbps	EUR/ Month	703	4297	5478	6115
960	Kbps	EUR/ Month	791	4865	6232	6959
1 024	Kbps	EUR/ Month	817	5037	6463	7217
1 984	Kbps	EUR/ Month	1098	6956	9112	10191
2 048	Kbps	EUR/ Month	1111	7050	9248	10344

Source: TERA Consultants

MPLS prices are significantly lower than existing prices but SDH prices are significantly above (except for below 50 km). This is due to the fact that the SDH network is emptier and emptier in the model. This reflects therefore diseconomies of scale with a bottom-up valuation while RomTelecom's network is probably significantly depreciated.

Considering the fact that MPLS prices are much lower and to avoid distorting the market, it is proposed to allow Romtelecom to let SDH prices unchanged if deemed appropriate by Romtelecom.

A similar calculation can be conducted for STM1. This can be used for setting STM1 interconnection links (STM1 leased lines are not regulated). Same assumptions are used, the main changes being: the use of total costs allocated to SDH leased lines above 2Mbps (instead of below) which are calculated in the cost model, the number of leased liens above 2Mbps and another gradient above 2Mbps (based on RomTelecom's MPLS retail gradient from 50 Mbps to 1Gbps).

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4   Fixed Ethernet backhaul services

This section specifies how ANCOM shall set the level of Ethernet backhaul services.

To that extent, the report assesses first the cost standard used for this service (see section 4.1) and then details the most relevant price structure (see section 4.2) taking into account the Romanian context.

4.1 Assessment of the cost standard

The Conceptual Framework stated that the tariff of Ethernet backhaul services shall be set on the basis of the LRAIC+ cost standard:

> *"ANCOM will calculate the cost of the following services on the basis of the LRAIC+ approach: […] Ethernet backhaul provided by Romtelecom through the access network."[82]*

The report therefore considers that Ethernet backhaul tariffs shall be set on the basis of the LRAIC+ approach.

A specific cost model has been developed for the Ethernet backhaul which partially uses inputs from the fixed core model. Documentation related to this model has been published for consultation by mid November 2012 and no respondent provided comments on it. Being aware of the cost standard used, the only remaining issue is related to the price structure of the service.

4.2 Assessment of the price structure

As detailed in the consultation document related to the Ethernet backhaul model documentation, the components of the associated service are:

1   Part from the point of presence of the alternative operator to the Romtelecom's building ODF to which the cabinet is connected to. This part uses only the fixed core network of Romtelecom.

2   The part linking the ODF at Romtelecom's building to the ODF at Cabinet/Container. This corresponds to a fibre link laid in a trench.

3   The additional required equipment in Cabinet/Container is made of:

   a.   1 Ethernet switch;

   b.   2 ports for the ODF;

   c.   1 aggregation port for the switch;

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[82] Source: ANCOM, Calculation of the costs of efficient provision for some electronic communications services provided at the wholesale level in Romania Phase 1: Conceptual Framework, p.17

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d. 1 service port for the switch; and

e. 2 patch cords between the switch and the ODF.

Figure 41 – Components of the Ethernet backhaul service
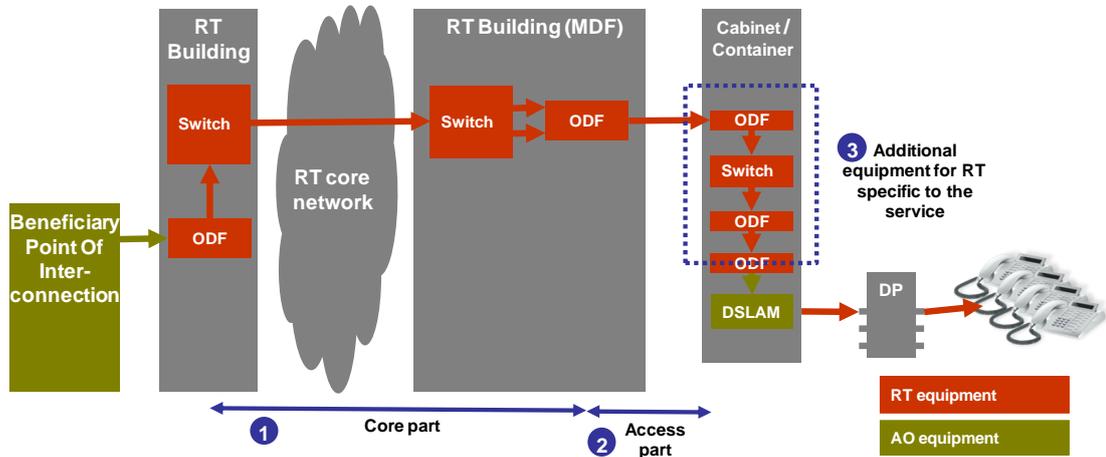
Depending on where the alternative operator is interconnected to Romtelecom's network and especially on how far it is from the cabinet/container where it has installed its equipment, the Ethernet backhaul service will use more or less of RomTelecom's core network. As a consequence, Ethernet backhaul service prices can be set along two approaches.

The first approach consists in specifying the tariffs of the different Ethernet backhaul services which may be requested by alternative operators depending on their level of interconnection. Five types of interconnection have been identified:

- MDF direct interconnection using only the ODF of the MDF and a dedicated fibre to the access;
- Interconnection transiting via switches, but staying at the MDF;
- Local interconnection using only switches and 1 PE router;
- Regional interconnection using switches, 2 PE routers and 1 P router; and
- National interconnection using switches, 2 PE routers and 2 P routers.

The advantage of this approach is that the price structure would be quite easy to understand.

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Figure 42 – Ethernet backhaul services modelled
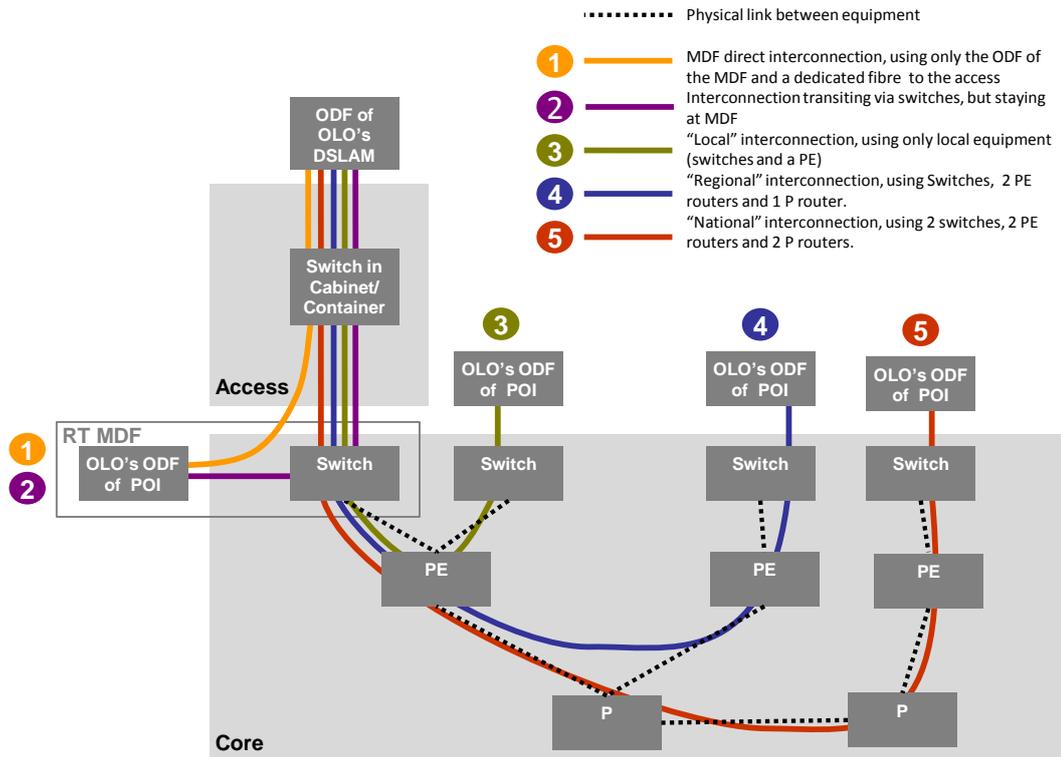
Source: TERA Consultants

Another approach would be by determining tariffs for each network element separately so that operators may choose the different elements of the network they need. For this approach "a la carte", ANCOM identified five elements:

- For the access part (which cost also depends on the speed and on whether the alternative operator wants to get access to a DP or a PCP) :
  - Direct link from Cabinet/Container/DP to OLO's ODF located at the MDF (no additional core element required);
  - Shared link from Cabinet/Container/DP to OLO's ODF located at the MDF but going through the switch at the MDF (no additional core element required);
- Direct link from Cabinet/Container/DP to the closest MDF (additional core element required).For the core part (to be added in case the "Direct link from Cabinet/Container/DP to the closest MDF" is used) which cost depends also on the speed required:
  - Switch-PE segment;
  - PE-P segment;
  - P-P segment.

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According to ANCOM, this approach is much more flexible for alternative operators than the first one.

It is therefore recommended to adopt this latter price structure.

The associated tariffs depend on several elements:

- The capacity requested, being aware that there are only two options: 1Gbps and 10Gbps;

- Whether a cabinet or a container is considered;

- The distance between the DSLAM and Romtelecom's building (which depends whether the place considered is a PCP or a DP and on the geotype considered)

- How far the fixed core network is used.

Table 21 – Bundled Ethernet backhaul tariffs

	Total service costs (core + access) (EUR/month)			
	At PCP		At DP (Via PCP)	
	1Gbps	10Gbps	1Gbps	10Gbps
Service 1: Direct link from Cabinet/Container to OLO's ODF at the MDF	257	536	289	568
Service 2: Shared link from C/C to OLO's ODF at MDF	734	5 913	749	5 929
Service 3: Shared link from C/C to OLO's ODF at another local MDF	4 021	38 793	4 037	38 809
Service 4: Shared link from C/C to OLO's ODF at another regional MDF	8 659	85 170	8 675	85 186
Service 5: Shared link from C/C to OLO's ODF at another national MDF	9 489	93 471	9 505	93 487

Source: TERA Consultants

Table 22 – "A la carte" Ethernet backhaul tariffs

"Access" elements	Access service costs excluding core costs (EUR/month)			
	At PCP		At DP (Via PCP)	
	1Gbps	10Gbps	1Gbps	10Gbps
Service 1: Direct link from Cabinet/Container to OLO's ODF at the MDF	257	536	289	568
Service 2: Shared link from C/C to OLO's ODF at MDF	734	5 913	749	5 929
Services 3-5 base : Shared link from C/C to OLO's ODF at another MDF location	189	468	205	483

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"Core" elements (For services 3 to 5)

Cost of core segments per Mbps	EUR/Mbps /month
Switch-PE single segment	1,87
PE-P single segment	2,26
P-P single segment	0,41

Source: TERA Consultants

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