WACC CALCULATION FOR FIXED-LINE AND MOBILE OPERATORS IN ROMANIA

A report summarising the responses to WACC calculation presentation

Purpose: To summarize the responses received by ANCOM following the WACC calculation presentation

October 2012

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List of acronyms

ANCOM	National Authority for Management and Regulation in Communications (Romanian NRA)
IRG	Independent Regulators Group
ERP	Equity Risk Premium
CRP	Country Risk Premium
Rf	Risk-free rate
WACC	Weighted Average Cost of Capital

1 Introduction

1. ANCOM (“National Authority for Management and Regulation in Communications”) presented a WACC calculation paper for the fixed and mobile operators in Romania and the associated excel model. The WACC calculation is performed in the context of building bottom-up costing models for the efficient service provision of wholesale services in Romania.
2. These files were sent to the Romanian operators, presented and discussed during an industry group meeting on August 3.
3. Following this presentation, ANCOM has received comments from the following stakeholders:
    a. Romtelecom;
    b. Orange Romania – Analysys Mason; and
    c. Vodafone Romania S.A..
4. The following section summarises the analysis of all stakeholders’ comments and the responses of ANCOM.
5. The updated WACC calculation paper is annexed to this document.

2 Main changes made to the conceptual framework as a result of the comments received

Several comments were received from the operators. The main consequences relate to two issues.

1. **Issue #4 – Risk-free rate:** ANCOM will update the risk-free rate from 5.90% to 6.39%.
2. **Issue #6 – Beta:** ANCOM will use both Miller and Modigliani-Miller formulas to lever and un-lever beta. It results in an increase of mobile beta from 0.73 to 0.74 and fixed-line beta from 0.69 to 0.71.

As a consequence, the WACC is modified accordingly:

WACC	Initial	Updated
Fixed-line	10.1%	**10.7%**
Mobile	10.5%	**11.1%**

3 Responses to the WACC calculation presentation and ANCOM view and position

Issue 1: General comments	
Comments received	**ANCOM view & position**
One respondent states the inflation differential between Romania and the Eurozone should be taken into account • If the cost models prices are in EUR, then the future exchange rate should incorporate this inflation differential. • If the cost models prices are in RON, then the WACC should incorporate this inflation differential.	**Comment accepted but no impact on the calculation and on the results** Cost models prices and price trends are observed in European countries so there is no impact on the WACC calculation. It is agreed that if regulated rates are set in RON, then the looking-forward exchange rate from EUR to RON will need to consider the inflation differential, but in this case prices will be regulated in EUR.
The recommended value is in the low end range of the minimum and maximum values and significantly below the WACC calculated for fixed access network for 2010.	**Comment cannot be accepted (incompatible with standard approach)** The recommended values are the results of the methodology presented in the documentation report that has been presented to all operators. This methodology is consistent with IRG best practices and with European regulators decisions. When multiple outcomes were possible, it has been decided to choose the centre of the range of possibilities, as it is in our view the fairest approach. The minimum and maximum values for each parameter and the corresponding result of WACC calculation were given only for illustrative purposes, while the recommended values are clearly indicated and rely on professional judgement and expertise and on best practices

ANCOM final view:

No change.

Issue 2: Study period	
Comments received	**ANCOM view & position**
One respondent believes choosing a 5 year-period is better than a three year-period in order to decrease the effects of volatility.	**Comment cannot be accepted** IRG recommends using a study period going from 2 to 5 years. Nevertheless most European regulators use a study period between 2 and 3 years as it is important to keep the most recent values as the WACC computed is forward-looking. E.g. Belgium, Macedonia and Netherlands use a 3 year-period. Switzerland and Portugal use a 2 year-period. To our knowledge, only Germany is using a 5 year-study period. Furthermore using a 3 year-period, i.e. from the beginning of 2009 to the end of 2011, it allows taking into account the financial crisis without giving it too much weight.

ANCOM final view:

No change.

Issue 3: Benchmark

Comments received	ANCOM view & position
One respondent believes the peer group for mobile operators should be more focused on mobile operators and therefore excludes all integrated operators in order to differentiate mobile WACC and fixed-line WACC. The respondent has therefore proposed a peer group constitute of Vodafone Group PLC, Elisa Corporation, Vivendi S.A., Telefonica Czech Republic, a.s., SONAECOM-S.G.P.S. S.A., MOBISTAR S.A. and Tele2 AB.	**Comment cannot be accepted (incompatible with standard approach)** There are several drawbacks to form a peer group with only mobile operators: • The peer group proposed would be very small (only 7 operators). Furthermore, excluding all operators which have fixed-line activities would reduce it even more than the proposed peer group. E.g. Vivendi S.A. which was proposed in the new peer group includes fixed-line activities in France. Same for Tele2 AB or Elisa Corporation. • Excluding integrated operators results in excluding many market actors in many countries which hold a non-negligible market share. E.g. France Telecom S.A. (or Deutsche Telekom A.G.) would be excluded although they are France (or Germany) leading mobile operators. • Many mobile operators in Europe are part of an integrated operator. E.g. Orange Romania is part of Orange and should therefore be taken into account. • The mobile operators in Romania provide also fixed telephony services, enjoying a degree of integration.

ANCOM final view:

No change.

Issue 4: Risk-free rate	
Comments received	**ANCOM view & position**
Based on the general comments (see § Issue 1), one respondent believes risk-free rate calculation is acceptable (based on German bonds plus country risk premium) if prices are in euro otherwise inflation differential should be taken into account.	**Accept in principle, but no impact on the calculation** Cost models prices and price trends are in euros so there is no impact on the risk-free rate calculation (see §Issue 1).
The computation of the risk-free rate based on Romanian bonds cannot be totally excluded from the calculation as yield fluctuations shows it is not illiquid. It should be part of and taken into account by computing an average between the rate computed with Romanian bonds and the rate computed with bonds from an 'AAA' rated country plus a CRP.	**Comment cannot be accepted (incompatible with standard approach)** The computation of the risk-free rate based on Romanian bonds is possible only if the two following conditions are met: • Romania is rated as investment graded • Bonds are liquid Romania has been attributed an investment grade by two of the three main credit rating agencies at the low end range. The third credit rating agency has given a lower grade to Romania. As a consequence, the grades given by the three rating agencies imply that Romanian bonds cannot be considered as investment graded. Yield fluctuation is not an evidence of the market liquidity. Given the low volume of bonds traded and the low annual turnover compared to mature markets considered as liquid, the Romanian bonds market cannot be considered as liquid. Furthermore the number of bonds issued by the Romanian government is even more limited with a total of 17 including only 5 that are still running. For comparison purposes, Germany has issued at least 95 bonds with a maturity of 10 or more years (even more if we consider as for Romania bonds with all maturities) that are still running. France has more than 130 bonds with a maturity greater or equal to 10 years still running, United Kingdom has more than 150.

The yield that should be used for the 'AAA' rated country should not be German yield but the average yield between all the 'AAA' rated countries in Europe resulting in a Rf of 3.18% instead of 2.90%.	**Comment accepted** The risk-free rate will be based on the average yield of all the 'AAA' rated countries in Europe as suggested by the respondent which leads to a value of 3.19% for the 'AAA' countries Rf.
The Romanian CRP should be based on the grade attributed by the three main credit rating agencies and not solely Moody's. The result would be a CRP of 3.20% instead of 3.00%	**Comment accepted** The grades given by the three credit rating agencies will be used to evaluate the CRP which leads to a value of 3.20% for the Romanian CRP.
One respondent believes that "country risk should be adjusted in order to reflect the volatility of Romanian market shares against Romanian bonds" by adding an additional premium of 3.26% calculated by Professor Damodaran on top of the current risk-free rate.	**Comment cannot be accepted (incompatible with standard approach)** The risk-free rate (Rf) is calculated based on the following formula: Romanian Rf = 'AAA' countries Rf + Country Risk Premium. The country risk premium (CRP) is a premium added on top of the 'AAA' rated countries Rf reflecting the difference of risk between 'AAA' rated countries and Romania, a 'Baa3' rated country. This CRP includes already all possible risks meaning the risk inherent to volatility is already taken into account in this premium. This is adjusted wtih grades provided by the three main credit rating agencies (see comment above). There is thus no fundamental change in the methodology.

ANCOM final view:

The risk-free rate computed as the sum of the yield of an 'AAA' rated-country and Romanian CRP is updated from 5.90% to 6.39%.

Issue 5: Debt premium	
Comments received	**ANCOM view & position**
One respondent states that it is inconsistent to “use a mix of spread and averages/median in calculating Debt premium”	**Comment cannot be accepted (incorrect)** ANCOM is not entirely sure to understand well the respondent’s comment. ANCOM understanding is there is confusion between spread, averages and median while calculating the debt premium. The “yield” of a CDS is called the spread. This spread is calculated for each company of the two peer groups (the peer group for the mobile WACC and the peer group for the fixed-line WACC). In order to obtain the final value of the debt premium, the arithmetic average and the median yield are computed. Finally the average of this arithmetic average and this median is computed. This final value is the debt premium. However in order to give the same weight between the CDS approach and the Iboxx and FTSE values, the Debt premium is calculated by giving the same weight to these three approaches (the impact on the final result is minimal).
Some incumbents are included although they have a very small share in mobile.	**Comment cannot be accepted (incorrect)** The peer group is defined to be the same for all the WACC parameters for consistency purposes.
There are some missing data.	**Comment cannot be accepted (incorrect)** There are no missing data. Some operators do not have credit default swap on their debt. The following operators do not have any CDS: • GO P.L.C.

	• TEO LT, AB • Bulgarian Telecommunications Company AD • TELEKOM SLOVENIJE, d.d. • SONAECOM – S.G.P.S. S.A. • Hrvatski Telekom d.d. • MOBISTAR S.A. • Magyar Teleom Telecommunications Public Limited Company • Telefonica Czech Republic, a.s. • Tele2 AB

ANCOM final view:

No change.

Issue 6: Beta	
Comments received	**ANCOM view & position**
One respondent believes using the Miller formula is better than using the Modigliani-Miller formula to lever and un-lever the beta as the Modigliani-Miller formula requires to estimate forward-looking effective tax rates for telecommunications companies and Miller formula does not depend on tax rates.	**Accepted comment** IRG states: "The impact of using either formula is small" and adds Miller formula is easier to implement but does not reject any of the two formulas. European regulators are split between the use of both formulas. Miller formula has been used by Belgium, Finland, Italy, Netherlands and United Kingdom while Modigliani-Miller formula has been used by Austria, Denmark, France, Greece, Spain, Sweden and Macedonia. When using Modigliani-Miller formula no European regulator has ever used a "forward-looking effective tax rates" but they have all used the statutory tax rates. ANCOM will therefore consider both formulas by computing the average of both results.
One respondent believes the peer group for the beta should be based on the following criteria: • Operators should have the same market capitalization • Countries considered should have a similar income level • Fixed-line penetration rate should be close to the Romanian one.	**Comment cannot be accepted (incompatible with standard approach)** To maintain consistency between the different WACC parameters, the peer group should remain the same during the whole calculation. The criteria proposed by ANCOM are transparent and easy to implement. They are in line with European best practices. The peer groups are made of: • Companies of the same geographic area (Europe) • With the same business activities (integrated operators for the fixed-line peer group; mobile and integrated operators for the mobile peer group).

	The criteria proposed by the respondent are difficult to implement and have never been implemented by any European regulator: • There is no proof at all that the beta is linked to the criteria selected by the respondent (it has not provided any economics study supporting its arguments) and there is no direct evidence. E.g. operators based in a European country with a low income level will have to price its telecommunications services at a lower level than in a country with a higher income level resulting in lower incomes for this operator. But in the same time, lower income level means lower cost of building, maintaining and operating a network as labour costs are far from being negligible. The result is thus that an operator based in a low-income European country has fewer revenues and fewer costs, and no conclusions can be drawn regarding the risk. • The WACC is applicable to a *generic* operator hence the data used should be extensive. • If considering countries with similar income level, we would have to compare Romania with many countries outside of Europe. No European regulator has included operators from outside European countries. • Fixed-line penetration rate is a criterion that no European regulator has used to form a peer group.
One respondent believes the beta should be adjusted thanks to the Vasicek's regression method instead of the Blume formula.	**Comment cannot be accepted (incompatible with standard approach)** IRG 2007 recommends adjusting the beta with a Bayesian, Blume or log adjustment. Most European regulators have decided to use the Blume Formula. Furthermore, no European regulator is using the Vasicek's regression method to adjust the beta. ANCOM will therefore continue to apply the Blume formula to adjust the beta.

ANCOM final view:

ANCOM will use the Miller-Modigliani and the Miller formulas to lever and un-lever the beta. This change results in an increase of the fixed-line beta from 0.69 to 0.71 and of the mobile beta from 0.73 to 0.74.

Issue 7: Equity Risk Premium

Comments received	ANCOM view & position
One respondent estimates the reference market should be Eastern Europe instead of Europe resulting in an ERP of 7.16% against 5.85%.	**Comment cannot be accepted (incompatible with standard approach)** It should be first noted that 2 operators only provide strong criticisms on taking a whole European ERP. The comments cannot be accepted for several reasons: 1. It is reminded that the equity risk premium is the differential return of the stock market over a risk-free rate (usually treasury bonds); the Romanian risk-free rate is itself based on a European risk-free rate from AAA countries on top of which is added a country risk premium. As a consequence the Romanian return of stock market is also impacted by the country risk premium and will be higher than the European AAA countries. **It is thus verified that the return of the Romanian stock market will be higher than the return of AAA countries' stock market.** 2. The principles and application of the marginal investor approach is supported by economic literature on WACC calculation: *a.* AFORST, Determination of Appropriate Cost of Capital Rates for the Regulated Fixed Services of France Telecom, 2005: *"The global CAPM assumes that there is a global supply and global demand for all forms of capital, investors hold fully diversified international portfolios made up of stocks from around the world. The model is therefore based on a global risk-free rate, **a single global EMRP** and a global beta. The proxy for the market portfolio should reflect the assumed diversification of France Telecom's **marginal investor**."* *b.* Christopher Agar, Capital Investment & Financing: a practical guide to financial evaluation, 2005: *"The **Global CAPM assumes investors hold diversified portfolios of worldwide investments and that all country markets are integrated into one global market.** Investors are assumed to be able to reduce risk by sector diversification (as in the domestic CAPM) and geographic diversification (foreign investment returns vary, not only with the foreign market index, but also some global market index). Capital markets are assumed to be integrated and not segregated, such that investors can invest anywhere in the world without restriction (it also assumes that a global market can be identified). CAPM inputs would be calculated with reference to the world market (which could be based on a recognized world index)."*

c. Tim Ogier, John Rugman, The Real Cost of Capital, 2004: *"In situation **where a company's shareholder register is largely dominated by investors holding fully diversified global portfolio,** there are strong arguments for using the **global CAPM approach.**"*

d. Damodaran itself recognises that the marginal investor approach has some strong theoretical grounds (however he warns against using a "global ERP" because of possible "home bias" in the investor portfolio, this is why the ERP is not global but European as it reflects the marginal investor in the Romanian telecom market.

Aswath Damodaran, Equity Risk Premiums (ERP): Determinants, Estimation and Implications, 2012: "*For purposes of analyzing country risk, we look at the marginal investor – the investor most likely to be trading on the equity. **If that marginal investor is globally diversified, there is at least the potential for global diversification.** If the marginal investor does not have a global portfolio, the likelihood of diversifying away country risk declines substantially.*"

3. The analysis of shareholders structure of the largest Romanian operators shows that the marginal investor is European:

    a. France (France Telecom), UK (Vodafone) and Greece (Hellenic Telecommunicatons).

    b. These operators have a very strong European footprint. France Telecom has 67% of its global revenues coming from just three European countries: France (50%), Spain (9%) and Poland (8%)[1]. Vodafone has 70% of its revenues coming from Europe[2]. The vast majority of the fixed and mobile revenues for Hellenic Telecommunicatons (OTE) are derived from Greece (63%) and Romania (29%)[3].

    As a consequence it is relevant to take a European ERP to reflect the expectations of the marginal investor.

4. A further evidence of the interconnection of the Romanian economy with the EU is the foreign direct investment (FDI) inflow: according to the European Commission 80% of the total FDI stock comes from the EU[4].

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[1] France Telecom financial KPIs 2011.

[2] Vodafone financial KPIs 2011.

[3] Hellenic Telecommunications Organization, Financial results 2011.

[4] European Commission, *FDI in Romania: from low-wage competition to higher value-added sectors*, 2008

	For all these reasons the ERP is maintained as a European ERP.
One respondent estimates a Country Risk Premium of 3.8% calculated by Damodaran that should be added on top of the current ERP. This would result in an ERP of 9.7%	**Comment cannot be accepted (incompatible with standard approach)** The country risk premium the respondent is referring to represents the difference between American ERP and Romanian ERP as calculated by Damodaran thanks to the relative standard deviation methodology. Such a country risk premium could be used if the method retained was to use American ERP plus a premium corresponding to the chosen reference market. ANCOM's approach is different: • First it consists in determining the reference market thanks to the analysis of the marginal investor. • Second to use the ERP value given by independent studies corresponding to this reference market. ANCOM has used two values given by the DMS study: • The first value is obtained by computing the arithmetic average • The second value is obtained by computing the geometric average. As there is no clear cut argument in favour of any of these two values, ANCOM has kept both and has computed the average. Thus ERP used in the WACC calculation is the average of the ERP for the European market computed thanks to the arithmetic average and the ERP for the European market computed thanks to the geometric average. Thus no Country Risk Premium should be added on the top of the current ERP.

ANCOM final view:

The ERP is kept at 5.85%.

Issue 8: Gearing

Comments received	ANCOM view & position
One respondent operator believes the gearing for the fixed-line WACC cannot be over 25% given the operator's financial situation and its outlook.	**Comment cannot be accepted (incompatible with standard approach)** The gearing has been computed according to European best practices, i.e. it is the average of gearings over the peer group. This approach has been used by ANCOM as it allows the WACC calculation to be more independent of the regulated companies' strategies and to avoid big fluctuations. As the respondent shows it, its gearing ratio is varying from 2% to 9.7%. Furthermore the value presented reflects the capital structure of an efficient operator and is consistent with the relevant cost base used in modelling the costs of wholesale services.

ANCOM final view:

No change.

WACC Calculation
for fixed and mobile operators in Romania

TERA

Ref : 2012-01-DB-ANCOM-BU LRAIC cost models

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UPDATED calculation paper

October 2012

Confidential

Summary

1. Introduction

2. Methodology

3. Final results

4. Annex

Introduction

- **The purpose of this document is to present the methodology and the results for calculating the weighting average cost of capital (WACC) for fixed and mobile network operators in Romania. It is based on several foundations:**
  - *The economic literature and theory on cost of capital calculation*
  - *The 2007 ERG paper on Principles of Implementation and Best Practice for WACC calculation (named "ERG 2007" in this presentation)*
  - *The best practices established by other European telecommunications regulators*

- **The source of the financial data used for the calculation is Thomson Reuters Datastream.**

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1. WACC formula and general assumptions

2. Gearing ratio

3. Cost of debt

4. Cost of equity

5. Tax rate

3. Final results

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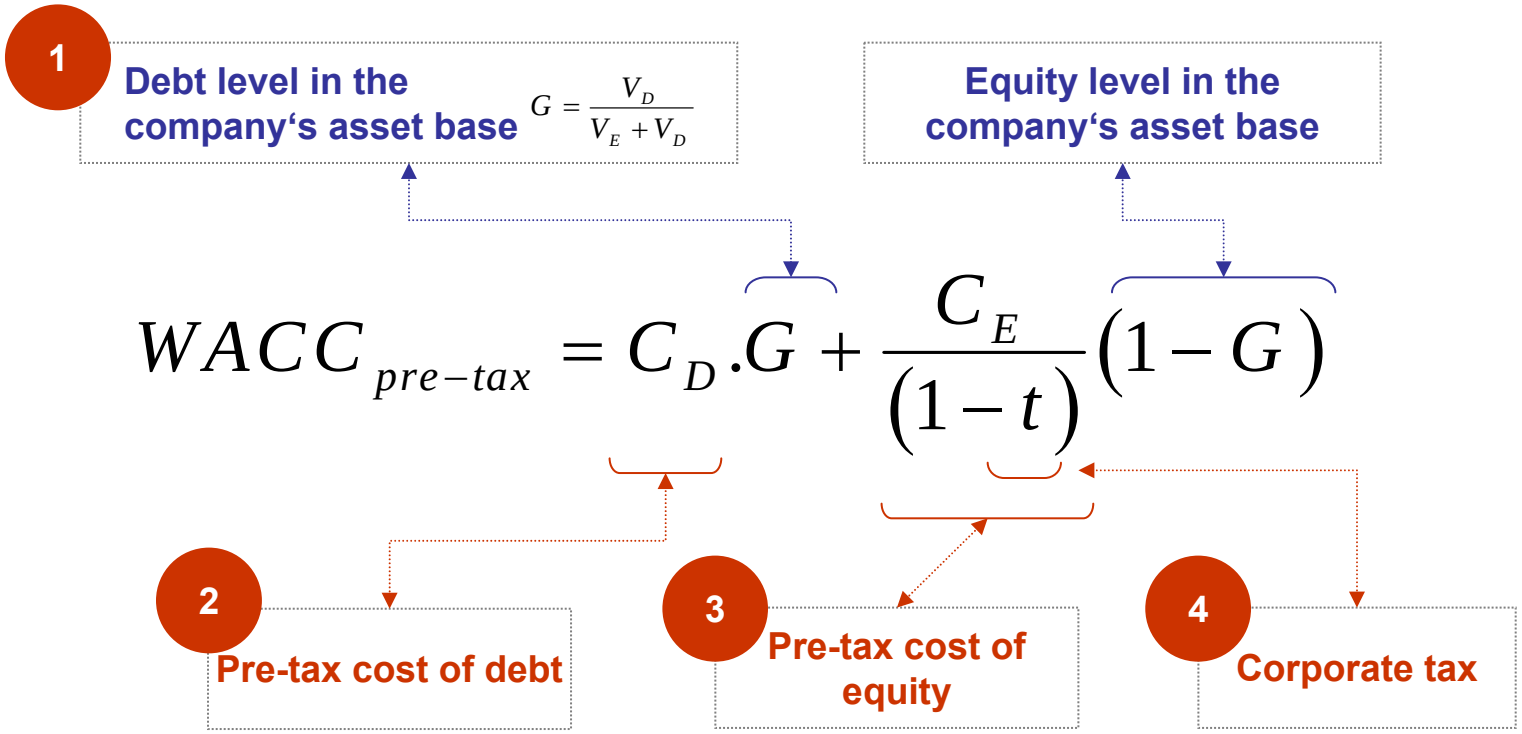
Reminder: Nominal pre-tax WACC is the weighted average pre-tax costs of debt and equity

- The Weighted Average Cost of Capital (WACC) is generally used by both the finance community, the industry, and by many regulators
- It is the minimum rate of return on investment expected by shareholders and creditors of the company and is a weighted average of the cost of debt and the cost of equity



Study period

- **To calculate the WACC, long time series should be computed for some parameters which is why the definition of the study period is important for data computation:**
  - *A large interval allows to better apprehend long-term trends and to decrease the volatility effects on data ; however, a shorter interval allows to better capture the most recent values which better reflect the current economic situation*
  - *The time series approach is consistent with regulatory practice across Europe*
- **As a consequence, a reasonable study period would be a 3-year period for those parameters (such as the risk-free rate or the beta[#])**

- **Furthermore, a 3-year period allows to take into account the crisis occurring in Europe without giving too much weight to it**
  - *On the one hand, a strong credit crunch arose from the increased spread that banks are requiring on top of the official rate which in turns increases the WACC value*
  - *On the other hand, there was a sharp decrease in interest rates; moreover telecommunications companies are considered as a safer investment in the context of the crisis, which decreases the Beta and thus the WACC value**
  - *This helps explain why the ERG has stated that "So far the financial crisis did not lead to any major changes in the WACC"[&]*

A reasonable study period is defined as a 3-year period

(#) For illustrative purpose, as ANACOM (Portugal) states it, "there is a notable preference among European regulators for periods of 2 to 5 years". (see ANACOM, Decision on the definition of the methodology to be used for calculating the cost of capital of PTC 2009-2011)
(*) ARCEP, Decision on the WACC, December 2011
(&) ERG Report , Regulatory Accounting in Practice 2009

WACC
G
C_D
C_E
T

Choice of the comparable companies (peer group)

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- **The set of comparable companies (peer group) is based on the following criteria:**
  - *Fixed integrated operators or mobile operators…*
  - *…based in Europe…*
  - *…with shares (either of the operator or the mother company if it is a telecom operator) traded on stock exchanges*

- **The list of comparable companies established for this study is similar to those of other regulators.**
  - *The peer group is made of 29 European telecom operators*
  - *The list is available in Annex*

Calculation of a separated WACC for fixed and mobile activities

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- **A differentiated WACC for fixed and mobile business continues to be recommended**
  - *It is a widespread practice among EU regulators because of the different risk of the activities;*
  - *A separated WACC reflects the potential differences between mobile and fixed networks in terms of capital structure and risk profile.*

Considering EU regulators' practices, and as already done by ANCOM, fixed and mobile activities should have their own specific WACC

Calculation of a unique WACC for fixed activities (no divisional WACC)

- **It is not recommended to implement a divisional WACC. There are several arguments against the adoptions of a divisional WACC:**
  - *Lack of appropriate data to support the estimation (there is no stock market information at divisional level)*
  - *As the fixed operator is vertically integrated, its ability to service debt and remunerate shareholders depends on all its activities*
  - *Very few regulators use a divisional WACC (Ofcom, PTS)*

Considering EU regulators' practices fixed activities should have a single WACC

WACC
G
C_D
C_E
T

Use of benchmarks

- This presentation will rely on some benchmarks provided by the ERG and ANCOM

- However the results of the benchmarks are only used to cross-check the calculation, and not as a direct input

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Gearing ratio (1/4)
Definition and approaches

$$G = \frac{V_D}{V_E + V_D}$$

$$WACC_{pre-tax} = C_D.G + \frac{C_E}{(1-t)}(1-G)$$

- The gearing measures the ratio of debt to company value. Three methods are available for calculating the gearing ratio (see ERG 2007)

1. Based on book values	2. Based on market values	3. Based on an efficient value

• **Based on the accounting value of the company's debt and equity**
 	
+ Easy to audit and transparent
– Not forward-looking and relies on the company's accounting policy and choices
	• **Based on the observed value of the company's debt and equity**
	  • Market value of equity: number of shares multiplied by current price
	  • Market value of debt: coupons bonds multiplied by market value. (If all bonds cannot be traded, the entire book debt can be treated as one single coupon bond valued at the current cost of debt for the company.)
	
	+ Reflect the economic value of the company
	– Dependent on market factors and fluctuations such as volatility, speculation
		• **Method 3.a: Based on an optimal capital structure**
		• **Method 3.b: Can be done through a benchmarking of other regulators' decisions**
		
		+ Independent of the strategies of Romanian operators and ensure not to reward over borrowing strategies or borrowing at a too high level
		– Can be subjective

Gearing ratio (2/4)

Method 3.a: Efficient value based on benchmarking of comparable companies (peer group)

- With this method, regulators generally use an hybrid method:
  - *As all debt is not raised on financial markets, the book value is a better estimate for the debt value*
  - *Market value better provides the most up-to-date value of equity*
- ERG recommends the following approach: when a company is owned by a group, data of this group are used to calculate the gearing (as long as it is a telecoms company)
- It is applied to European operators in order to be independent from Romanian operators' strategies
- For each company of the peer group, the gearing is computed as the monthly average over the study period:
  - *The monthly debt value is the latest book value available at that time*
  - *The monthly equity value is the market value of the company at that time*

$$G = \frac{V_D}{V_E + V_D}$$

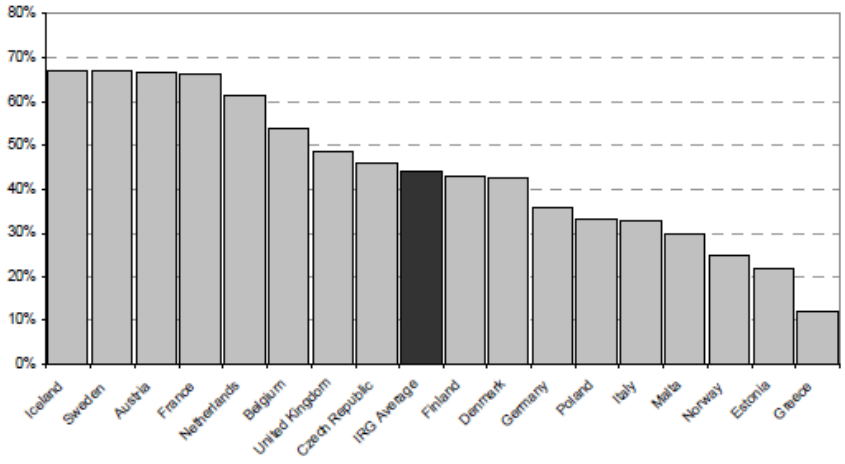
- The final gearing is obtained by computing either the median or the average of the gearing of the peer group companies

Analytic tool	Median approach	Average approach
Fixed-line operators	37,2%	41,6%
Mobile operators	36,3%	42.2%

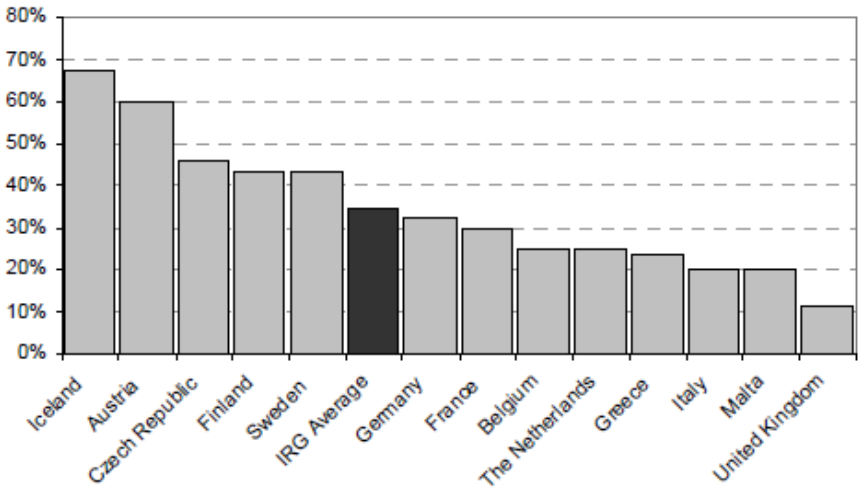
Gearing ratio (3/4)

Method 3.b: Benchmarking of regulator's decisions 2008

Gearing ratio for fixed network - 2008
Average of 44.2%



Gearing ratio for mobile network - 2008
Average of 34.3%



Source: ERG Report Regulatory Accounting in Practice 2008

Gearing ratio (4/4)
Synthesis and results

Gearing	Method 3.a (median approach)	Method 3.a (average approach)	Method 3.b (benchmark of regulators, average of 2008)
Gearing for fixed-line network	37.7%	42.7%	44.2%
Gearing for mobile network	35.0%	34.1%	34.3%

The recommended values are based on the average of the average approach and the median approach:
40.2% for fixed
34.5% for mobile
The recommended values are in line with European regulators decision

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Cost of debt
Definition and approaches

$$WACC_{pre-tax} = C_D G + \frac{C_E}{(1-t)}(1-G)$$

- The cost of debt reflect the borrowing cost of the company. Three methods can be used, but regulators only rely on the third one (see ERG 2007).

1. Based on book values

- **Based on the accounting data of the current loan book**

\+ Easy to audit and transparent
– Not forward-looking and relies on the company's accounting policy and choices
– Generally not used by regulators

2. Based on an efficient borrowing level

- **Based on an efficient loan book (portfolio of various long-run loans) associated with corresponding costs of debt**

\+ Independent of the strategies of actual operators and ensure not to reward over borrowing strategies or borrowing at a too high level
– Can be subjective
– Generally not used by regulators

Given the drawbacks of these two methods, they are generally not used by regulators (this is confirmed by the benchmark of European regulators)

3. Sum of the risk free rate and the company specific debt premium

- **$C_D = R_F$ + Debt Premium**
  - **Risk free rate:** expected rate of return of a risk-free asset, can be calculated with:
    - Method 3.α: based on Romanian bonds
    - Method 3.β: based on 'AAA' countries bonds + a country risk premium specific to Romania
  - **Specific debt premium** (also known as corporate spread): the premium on top of the risk-free rate that reflects the additional cost for the companies to raise debt. It can be calculated with:
    - Method 3.a: Credit Default Swap
    - Method 3.b: 10-year bonds index of European Telecoms Companies
    - Method 3.c: Benchmark of regulators decisions

\+ Forward-looking
– More complex

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Risk free rate (1/7)
Definition

- The **risk-free rate** is the expected yield of a risk-free asset, defined as an asset whose expected returns are known with certainty by investors

- It can be approximated by the yield of an **investment-grade** (e.g. a "AAA" rate) **and liquid government bond**
  - *It has (almost) no default risk as it is issued by a government*
  - *It can be traded very easily as it has no liquidity problem*

- As detailed previously, the risk free-rate can be calculated through two methods:
  - *Method 3.α: based on Romanian bonds*
  - *Method 3.β: based 'AAA' countries' bonds + a premium to reflect Romanian context*

Risk free rate (2/7)
Approach for each inputs

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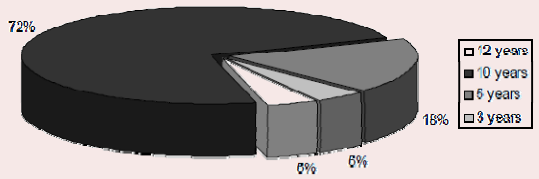
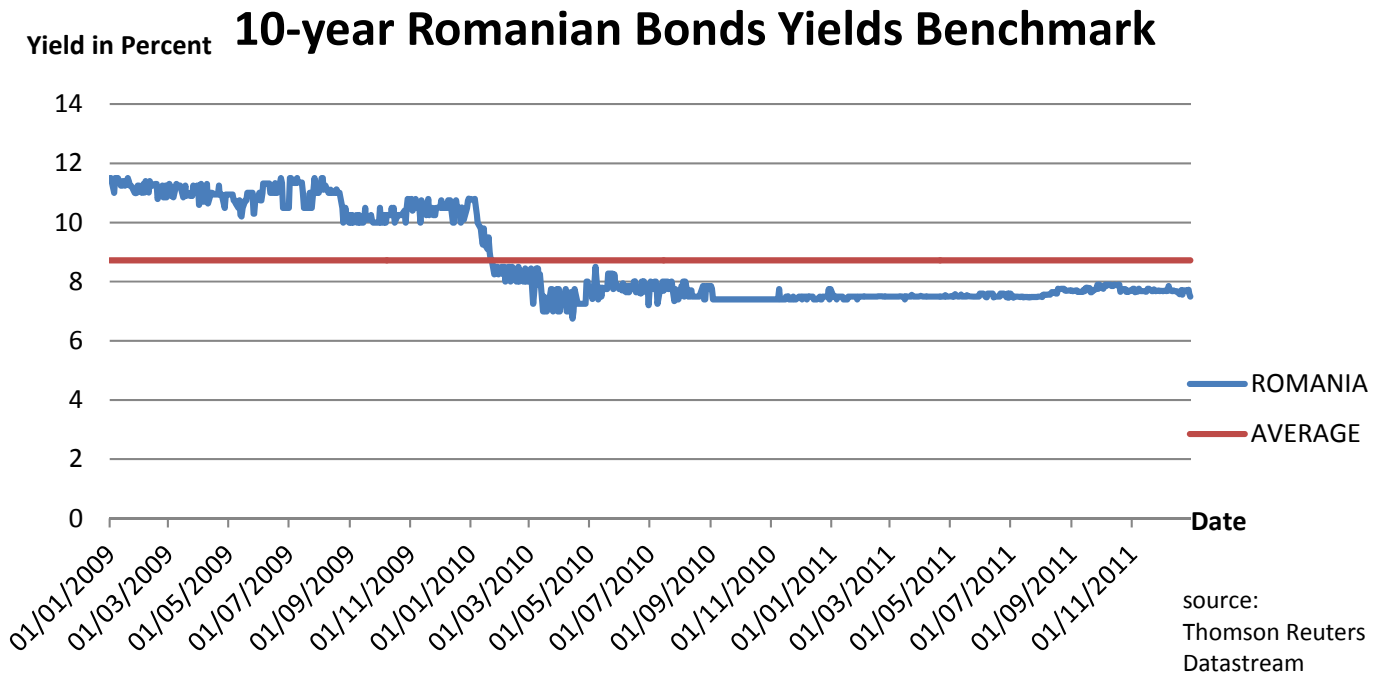
The calculation of the risk-free rate is based on three parameters/inputs (see ERG 2007)

Inputs	Approach	Analysis
Bond origin market	In principle it should be the financial market in which the company has activities	• (Method 3.α) In practice in Europe, as there is no government bond at a European level so the relevant market can be the domestic (Romanian) market • (Method 3.β) However, as Romanian bonds may lack liquidity, the risk-free rate can be computed using a 'AAA' country risk-free rate + a premium based on countries with a similar credit rating as Romania assessing the difference of risk between the 'AAA' countries and Romania.
Maturity of the bond	When establishing the maturity of the bond, three parameters must be established: •The investment horizon •The planning horizon •The regulatory review period	As a general rule, as the maturity should be consistent with the investment horizon, BEREC regulators mostly use 10-year bonds Maturity of the risk free rate  Source: ERG Report, Regulatory Accounting in Practice 2008
Data	Several parameters must be chosen to perform the calculation: •Current or past data •Data frequency	• As the cost of capital should be forward looking, and considering that current data better reflects future values (perfect market) averaged recent historical yields will be used. • The frequency of the observations should be daily as it increases accuracy

Risk-free rate (3/7)
Method 3.α: 10-year Romanian bonds (i/ii)

- Based on the bonds issued by the Romanian government, Thomson Reuters creates a benchmark that reflects the daily yield of 10-year bonds.



source:
Thomson Reuters
Datastream

- The risk-free rate is then the daily average over the study period of the daily 10-year bonds yield provided by Thomson Reuters.

The results of this method gives a risk-free rate for Romania of 8,7%

Risk-free rate (4/7)
Method 3.α: 10-year Romanian bonds (ii/ii)

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- **In principle the financial market should be the market in which the company is active: in Romanian operators case, it is the domestic market.**

- **However the market for Romanian government bonds seems very limited and thus lacks liquidity:**
  - *Few bonds have been issued by the Romania government*
  - *Few bonds (including Government, Municipal and Corporate bonds) have been issued on the Romanian stock exchange*
  - *The number of trades per year is low and has been decreasing since 2009*
  - *There seems to be a 2-time period (before and after 2010) where the rate dropped from more than 10% to less than 8%*

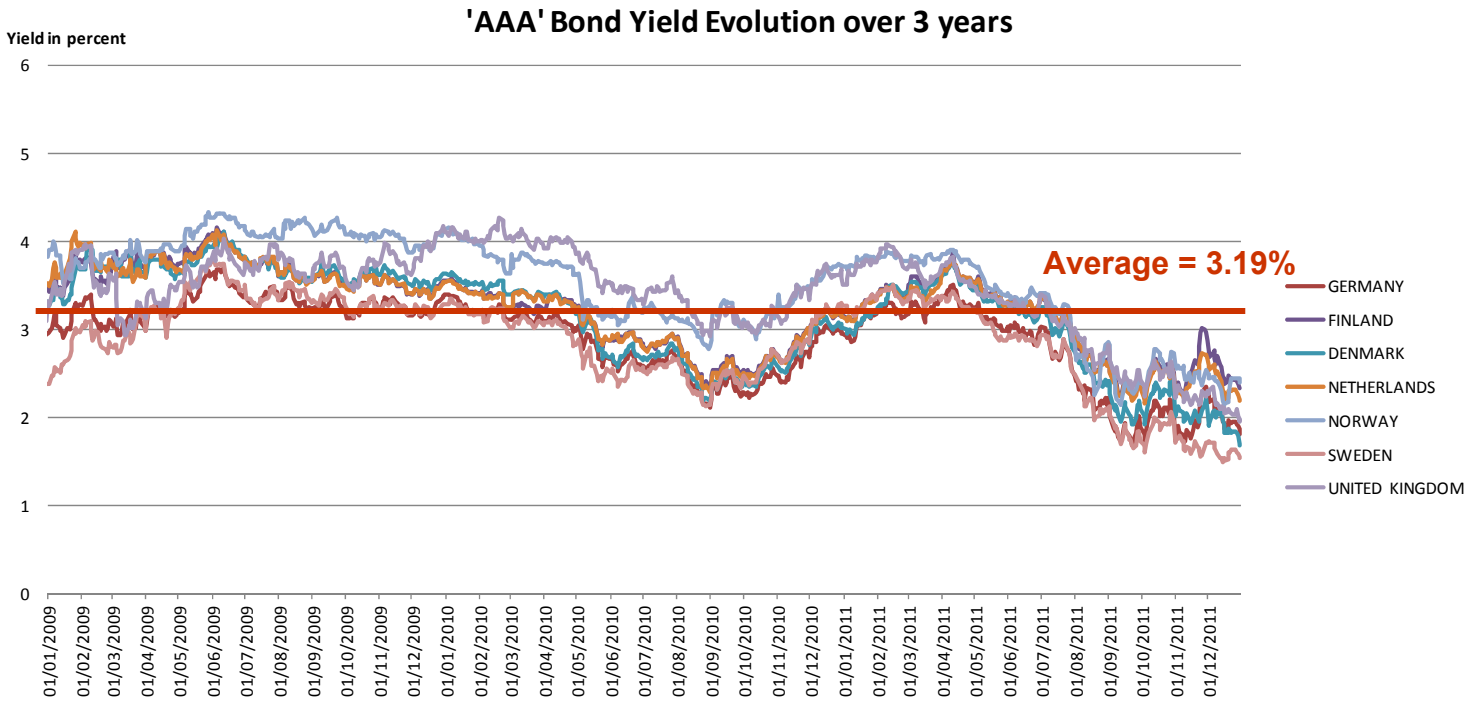
- **This has been acknowledged by ANCOM in the past.**

Due to the Romanian bond context (lack of liquidity), it is more suitable to rely on 'AAA' countries' bonds

Risk free rate (5/7)

Method 3.β: 10-year 'AAA' countries bonds + premium (i/ii)

- The yield of the 10-year bond is considered by all regulators to be a good value for the risk-free rate
- The risk-free rate of 'AAA' countries is calculated the exact same way as for Romania (with an average between all countries).



The results of this method gives a 'AAA' countries risk-free rate of 3.19%

Risk free rate (6/7)

Method 3.β: 10-year 'AAA' countries bonds + premium (ii/ii)

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- To assess the risk difference between 'AAA' countries and Romania, a country risk premium (CRP) has to be added to the 'AAA' countries risk-free rate in order to obtain the Romanian one.

Rating agency	Romania rating#	Moody's equivalence	CRP by Damodaran* for a given rating
Moody's	Baa3	Baa3	3.00%
Fitch	BBB-	Baa3	3.00%
S&P	BB+	Ba1	3.60%
		Average premium to be added	3.20%

The final results of this method gives a risk-free rate for Romania of 6.39%

(#) Source Bloomberg 2011.
(*)Methodology and results can be found on Damodaran website (Damodaran is Professor at the Stern School of Business at new York University)

Risk free rate (7/7)
Synthesis and results

Method	Method 3.β: Based on 10-year 'AAA' countries risk-free rate + premium without inflation differential
Risk-free rate for fixed and mobile networks	6.39%

The recommended value is based on the 'AAA' countries risk-free rate + premium approach: 6.39%

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Debt premium (1/6)
Introduction

- **Three methods are available to calculate the debt premium:**
  - *Method 3.a: based on Credit Default Swap (CDS)*
  - *Method 3.b: based on 10-year European Telecoms Companies Bond Index*
  - *Method 3.c: based on the regulators decisions benchmark*

Debt premium (2/6)
Method 3.a: Credit Default Swap (CDS)

- **The CDS Spreads constitutes a good proxy for the value of debt premium:**
  - *CDS is a financial swap used as an insurance against the default of a borrower with a difference: anyone can buy a CDS, even those that don't hold any debt.*
  - *John Hull, Mirela Predescu, and Alan White demonstrated(*) that "N-year CDS spread should be close to the excess of the yield on an N-year bond issued by the reference entity over the risk-free rate"*
  - *ANACOM (Portugal) has also used this approach (#)*

- **The CDS Spreads of each company of the peer group is then computed by calculating their daily average over the study period**

- **The debt premium is then obtained by computing the average or the median of the CDS Spreads of the peer group companies (see Annex)**

Analytic tool	Average	Median
Debt Premium rate for fixed-line networks	1.88%	1.62%
Debt Premium rate for mobile networks	1.92%	1.63%

(*) John Hull, Mirela Predescu , and Alan White of Rotman School of Management, University of Toronto in "The relationship between Credit Default Swap Spreads, Bond Yields, And Credit Rating Announcements", 2004
(#) Decision on the definition of the methodology to be used for calculating the cost of capital of PT Comunicações, S.A., applicable to the three-year period of 2009-2011, section 2.6

Debt premium (3/6)

Method 3.b: 10-year European Telecoms companies Bond Index

- **IBoxx and FTSE provide an index of 10-year European Telecoms companies Bond**
  - *Similarly to the calculation of the Romanian and 'AAA' countries risk-free rate, the yield is computed by calculating the daily average over the study period*

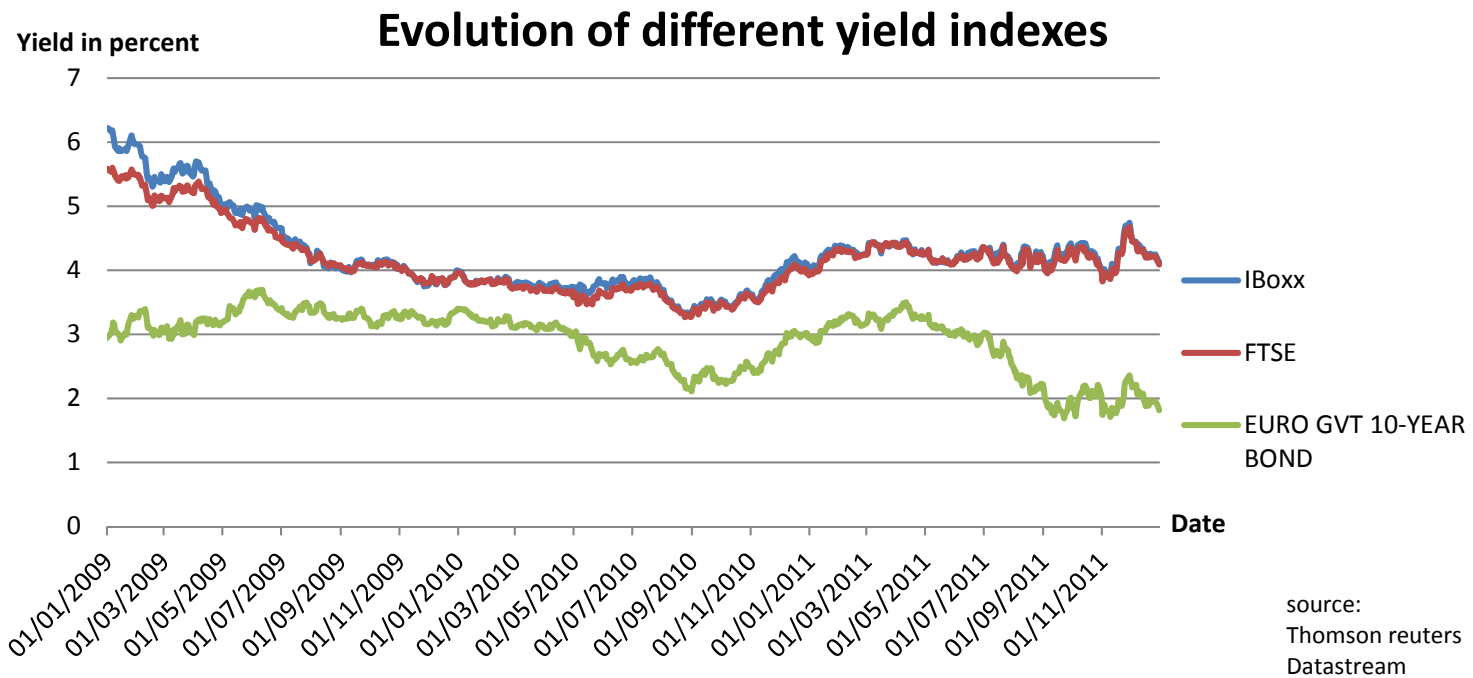
- **The debt premium can be deduced from the yields calculated thanks to those two indexes by subtracting the risk-free rate from the cost of borrowing**
  - *As those two indexes are European based, we need to use a European risk-free rate*
  - *As there is no European bond, the risk-free rate has to be deduced from a benchmark of bonds issued by European countries. Thomson Reuters Datastream provides such a benchmark. The European risk-free rate is then calculated the same way as it is computed for Romania.*

- **Debt premium = Yield of 10-year European Telecom Companies Bond - European risk-free rate**

Debt premium (4/6)

Method 3.b: 10-year European Telecoms companies Bond Index

- The IBoxx, the FTSE and the Thomson Reuters 10-year European government bond indexes are shown in the following graph:



source:
Thomson reuters
Datastream

- This method gives the following results

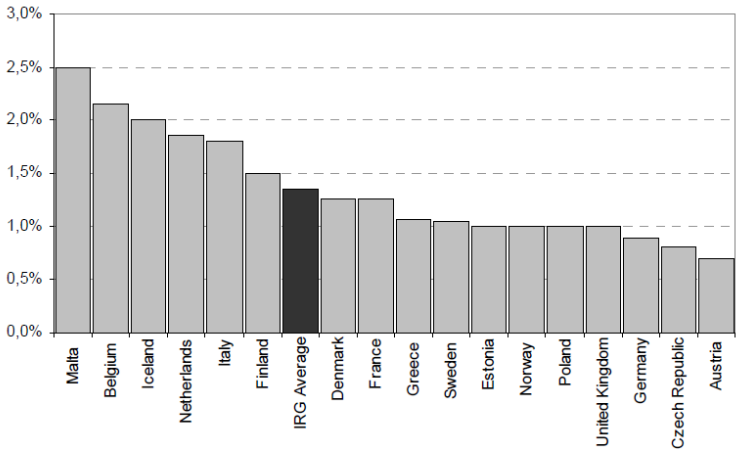
Index	Iboxx	FTSE
Debt Premium	1.34%	1.25%

Debt premium (5/6)

Method 3.c: Benchmarking of regulator's decisions 2008

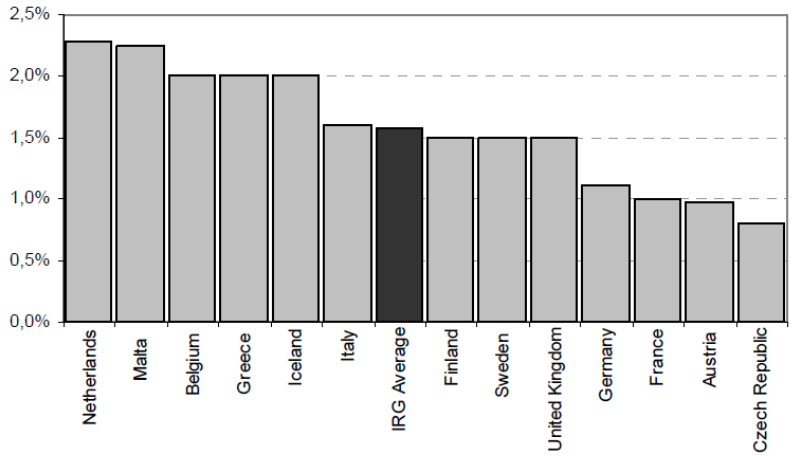
Debt premium for fixed network - 2008

Average of 1.35%



Debt premium for mobile network - 2008

Average of 1.58%



Source: ERG Report Regulatory Accounting in Practice 2008

Debt premium (6/6)
Synthesis and results

	Method 3.a: CDS (average and median approach)	Method 3.b: 10-year bonds of European operators	Method 3.c: Benchmarking of regulator's decisions (average 2008)
Debt premium for fixed networks	1.62 to 1.88%	1.25% to 1.34%	1.35%
Debt premium for mobile networks	1.63 to 1.92%		1.58%

The recommended values are based on the average of CDS approach and the 10-year bonds of European operators approach:
1.5% for fixed networks
1.4% for mobile networks
The recommended values are in line with European regulators decision

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Cost of equity
Definition with the Capital Asset Pricing Model (CAPM)

$$WACC_{pre-tax} = C_D.G + \frac{C_E}{(1-t)}(1-G)$$

- The risk borne by an investor is composed by a systematic risk linked to the investments in security markets as a whole and a specific risk linked to the company

$$C_E = r_F + \beta_E \times (r_M - r_F)$$

C_E : Cost of equity

r_F (1) : Risk-free rate of return

$(r_M$ (2) $)$: Market risk premium or equity risk premium

β (3) : Beta of the risky asset

- The rate of return required to satisfy investors for a given risky asset is the sum of the risk-free rate (r_F) and a risk premium β x ($r_M - r_F$) that measures the difference in expected returns between the market as a whole (perfectly diversified portfolio) and the given risky asset

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The risk free rate
REMINDER - Synthesis and results

Method	Method 3.β: Based on 10-year 'AAA' countries risk-free rate + premium without inflation differential
Risk-free rate for fixed and mobile networks	6.39%

The recommended value is based on the 'AAA' countries risk-free rate + premium approach: 6.39%

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Equity risk premium (1/6)
Definition and approaches

$$C_E = r_F + \beta_E \times (r_M - r_F)$$

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- The **equity risk premium** is a market factor that reflects the additional return an investor expects over the risk-free rate to invest in a risky asset instead of a risk-free asset (i.e. it measures the risk aversion of investors). Three methods can be used (see ERG 2007).

Method	Approach	Analysis
1. Historical values	Based on past data, the risk premium is measured by the average difference between realized returns on the market portfolio and those of a risk free asset	• Not totally objective and overestimates the return (see ERG 2007) • The Bucharest Stock Exchange was re-opened in 1995 (and no telecom company is listed). As it is not possible to have an enough long history, estimating the equity risk premium on its base would not be reliable
2. Studies	Based on independent studies led by financial experts: ➢Based on historical values of several markets (DMS, Damodoran) ➢Surveys (Fernandez)	• Reliable studies (especially the DMS study which is widely used) • Forward looking
3. Benchmark	Comparison with other regulators decision	• This method is recommended as a cross-check

Equity risk premium (2/6)

Method 2: Studies – Definition of the reference market

- **Available financial studies compute the equity risk premium for different reference markets (i.e. specific countries, "Europe" or "World"). It is thus necessary to establish this reference market in the context of Romanian telecom operators**
  - *Any investor investing in a Romanian company arbitrates decision between several markets: this "pool" of markets constitutes his reference market.*
    - It will expect from a Romanian company the return of the reference market, otherwise, it will not invest in this Romanian company
  - *The type of investor that defines the relevant reference market in the context of the ERP is the "marginal investor", i.e. the additional investor willing to invest in Romanian operators and which focuses on shares freely traded on the stock exchange (see IBPT 2010 Decision* in Belgium for more details)*

- **The analysis of the ownership structure of Romanian operators suggests that the reference market of the "marginal investor" is Europe:**
  - *A very strong majority of the Romanian operators are owned by European telecommunications firms*
  - *A very strong majority of top shareholders are European firms*
    - UPC is owned by an American company. However this company, Liberty Global Inc. has mainly activities in Europe (plus Chile and Australia). This suggests Liberty Global arbitrates its decisions mostly between the European markets.

The reference market is established as being the Europe market.

*** IBPT, Annexe 1 à la décision du 4 mai 2010 concernant le coût du capital pour les opérateurs**

Equity risk premium (3/6)
Method 2: Studies – Arithmetic or geometric average

- **Calculating the different parameters of the WACC implies the estimation of historical premiums, that is to say how the average returns on stocks and treasury bonds are computed. There are two methods to calculate this average return:**
  - *The arithmetic average return measures the simple mean of the series of annual returns*
  - *The geometric average returns measures the compound annual growth rate (CAGR)*

- **According to the economic literature, there is no clear-cut advantage of one averaging method compared to another:**
  - *Damodoran* states that each method has its own benefits and drawbacks*
  - *Indro and Lee# suggests to compute both methods and to rely more on the arithmetic average for short term horizon and on the geometric average for long time horizon*

Given the advantages of both averaging method, the arithmetic and geometric averages are computed

**Aswath Damodaran, Equity Risk Premiums (ERP): Determinants, Estimation and Implications, October 2008 (http://pages.stern.nyu.edu/~adamodar/pdfiles/papers/ERPfull.pdf)*
#Daniel Indro, Wayne Lee, Biases in Arithmetic and Geometric Averages as Estimates of Long-Run Expected Returns and Risk Premia, 1997 (http://www.jstor.org/stable/3666130)

Equity risk premium (4/6)
Method 2: Studies – Results for Europe

Study	Comment	Arithmetic	Geometric
Dimson, Marsch and Staunton (2011)	• In regulatory purpose, the most commonly used paper for estimating the risk premium is the Dimson, Marsch and Staunton's (DMS) study that is updated each year. They provide the risk premiums from 1900 to 2011. • This study provides a result for Europe.	6.9%	4.8%
Damodaran (2011-2012)	• Based on "Equity Risk Premiums (ERP): Determinants, Estimation and Implications", 2011 • Measure for the United States of the equity risk premium for stock over ten-year Treasury bond returns from 1928 to 2010. • Damodaran doesn't compute a result for Europe but for many European countries. As a consequence, we have computed the weighted average of the results found for each country. The weights are the 2010 GDP of each country.	7.2%	7.2%
Fernandez (2011)	• This study is a survey led by Fernandez for the IESE Business School. It considers that financial practitioners are the best experts to estimate the expected market return. As a consequence, this survey asks professors, analysts and managers their expected equity return. • The survey has been done for 56 countries in 2011 (20 of which are in Europe).	5.7%	5.7%

Given the appraisal from regulators for the DMS study*, the equity risk premium value will be based on this study

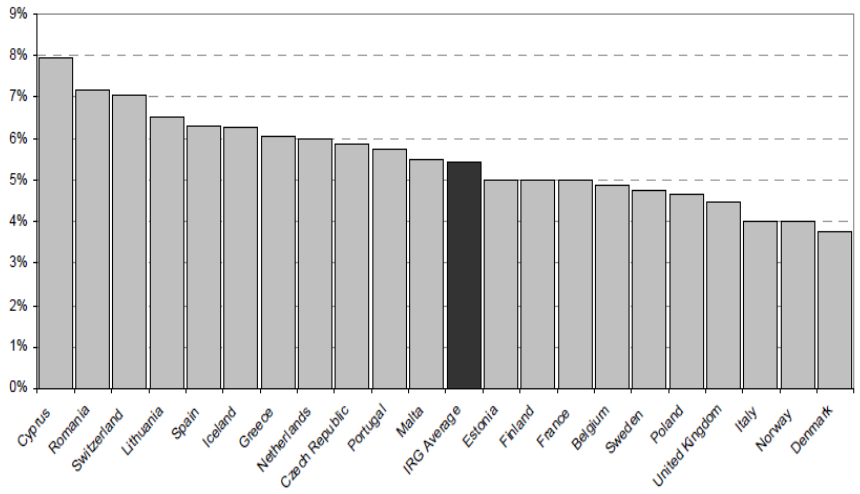
**** Ofcom's approach to risk in the assessment of the cost of capital, 2005: The recent work carried out by Dimson, Marsh and Staunton ("DMS") is widely regarded as being one of the most authoritative sources of historical estimates.***

Equity risk premium (5/6)

Method 3: Benchmark of regulator's decisions

Equity risk premium for fixed and mobile networks - 2008

Average of 5.3%



Source: ERG Report Regulatory Accounting in Practice 2008

Equity risk premium (6/6)
Synthesis and results

	Method 2: DMS with arithmetic average	Method 2: DMS with geometric average	Method 3: Benchmarking of regulator's decisions (average 2008)
Equity risk premium for fixed and mobile networks	**6.9%**	**4.8%**	**5.3%**

The recommended value is based on the average of the DMS arithmetic average approach and the DMS geometric average approach: 5.85%
The recommended value is in line with European regulators decision

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Beta (1/4)
Definition and approaches

$$C_E = r_F + \beta_E \times (r_M - r_F)$$

- **The Beta is a specific factor that reflects the risk of the risky asset over the market risk (broad portfolio of assets). Four methods are available for regulators to calculate it (see ERG 2007)**

Method	Approach	Issues
1. Historical values	The Beta is measured by the comparison between the regression of the company returns Rj (including both dividends and price appreciation) and the market returns Rm (Rj=α+β*Rm where β is the Beta of the stock.	• This method has some drawbacks such as estimation errors (see ERG 2007 for more details)
2. Adjusted benchmark of comparable companies	Based on the benchmark from the β of comparable companies. This method has to be adjusted to take into account different financial leverage across companies.	• As financial leverage can vary across companies, un-levered β are compared and applied to the company after re-leveraging • This method is forward looking, and practicable for non-quoted companies
3. Divisional approach	Calculation of a target Beta based on fixed and mobile EBITDAs of integrated operators	Not possible to implement it due to the lack of publicly available data (not enough integrated operators disclose the breakdown of EBITDA between fixed and mobile activities)
4. Benchmark of regulators	Comparison with other regulators	Good for cross-check analysis

Beta (2/4)

Method 2: Adjusted benchmark of comparable companies

- **For each company of the peer group the Beta is computed using the following steps:**
  - *A levered Beta is computed as the linear regression of the stock value on the index value over the study period:*
    - The stock value is the daily and weekly values of the stock of the company considered
    - The index value is the daily and weekly values of the domestic index
    - Daily/weekly data is used and not monthly data in order to allow greater statistical accuracy and as the Brattle Group stated in 2002: "The problems associated with monthly data are severe, while the problems generally associated with daily data appear relatively minor."(*). This has been acknowledged by other regulatory authorities.
  - *The Beta is then unlevered using the Modigliani-Miller and Miller Formulas (two beta are computed):*
    - Modigliani-Miller formula: β_Levered =β_Unlevered x [1 + (1-T)(Total Debt) / (Market Cap)]
    - Miller formula: β_Levered =β_Unlevered x [1 + (Total Debt) / (Market Cap)]
    - The Total Debt on Market Cap ratio is computed based on the gearing of the company considered calculated previously
    - The tax value is the domestic corporate tax value
  - *The Beta is next relevered using respectively Modigliani-Miller and Miller Formulas:*
    - The Total Debt on Market Cap ratio is computed based on the gearing used for the WACC calculation
  - *The Beta is then adjusted with a Blume adjustment*
    - Blume adjustment formula: β_Adjusted = 0.67 x β_Raw + 0.33
  - *The Beta of the considered company is finally obtained by computing the average of the beta obtained with the Modigliani-Miller formula and the beta obtained with the Miller formul*

- **The final Beta is obtained by computing the average or the median of the Beta of each companies of the peer group**

Analytic tool	Daily (avg/median)	Weekly (avg/median)
Beta for fixed networks	**0.75/0.72**	**0.69/0.68**
Beta for mobile networks	**0.77/0.74**	**0.73/0.73**

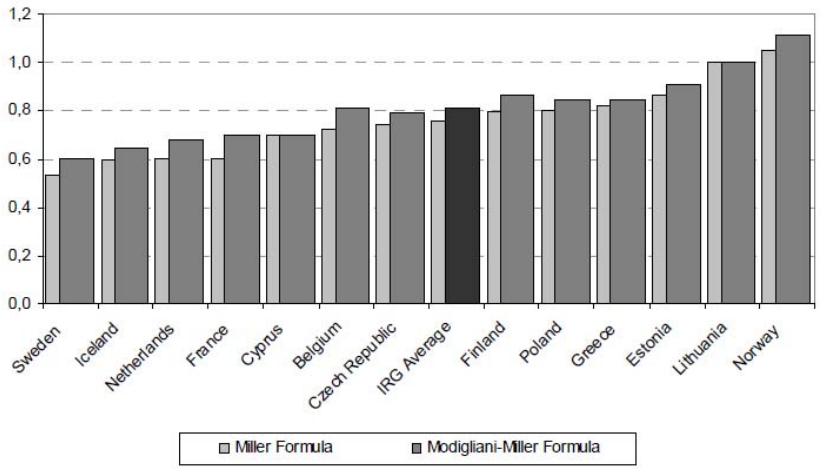
(*) ARCEP, Determination of Appropriate Cost of Capital Rates for the Regulated Fixed Services of France Telecom, 2005

Beta (3/4)

Method 4: Benchmarking of regulator's decisions 2008

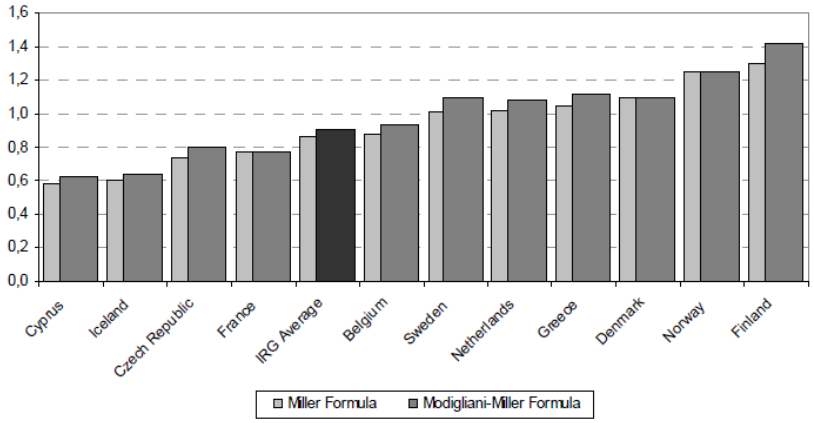
Asset beta for fixed networks - 2008

Average of 0.80



Asset beta for mobile networks - 2008

Average of 0.85



Source: ERG Report Regulatory Accounting in Practice 2008

Beta (4/4)
Synthesis and results

	Method 2: Benchmark of comparable companies with daily data	Method 2: Benchmark of comparable companies with weekly data	Method 3: Benchmarking of regulator's decisions (average 2008)
Beta for fixed networks	0.72/0.75	0.68/0.69	~0.80
Beta for mobile networks	0.74/0.77	0.73	~0.85

The recommended value on the Beta is based on the average of the min and max value:
0.71 for fixed networks (average of 0.72 & 0.75 & 0.68 & 0.69)
0.74 for mobile networks (average of 0.74 & 0.77 & 0.73 & 0.73)
The recommended values are in line with European regulators decision

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Tax rate (1/2)
Definition and approaches

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Statutory tax rate

- **Based on the accounting data of the current loan book**

+ Forward looking and transparent and easy to implement
+ Independent from the capital structure of the company

Effective tax rate

- **For a company, actual tax rate can vary each year depending**
- on capital allowances (Reduction in the amount of corporation tax payable, offered as an incentive for investment)
- the impact of different tax rates for a company operating in several countries
- relief from past losses

+ Can take into account durable differences between statutory and effective tax rate
– Short term

Due to the benefits of the statutory tax rate, the effective tax rate approach is generally not used by regulators (this is confirmed by the benchmark of European regulators)

The tax rate (2/2)
Results

	Statutory tax rate
Tax rate for fixed networks	16%
Tax rate for mobile networks	16%

The recommended value of the tax rate is 16%

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Synthesis and final results
(including comparison with 2010 ANCOM values)

WACC	Fixed				Mobile		
Category	2010	2012 (min)	2012 (max)	2012 recommended value	min	max	2012 recommended value
Cost of Debt = R_F + DP							
Risk-free rate (R_F)	N/A	6,1%	10,9%	**6,39%**	6,1%	10,9%	**6,39%**
Debt Premium (DP)	N/A	1,3%	1,9%	**1,5%**	1,3%	1,9%	**1,5%**
Cost of Debt (C_D)	5,7%	7,4%	12,8%	**7,9%**	7,4%	12,8%	**7,9%**
Cost of Equity = R_F + β*ERP							
Risk-free rate (R_F)	10,7%	6,1%	10,9%	**6,4%**	6,1%	10,9%	**6,4%**
Beta (β)	0,83	0,68	0,75	**0,71**	0,73	0,77	**0,74**
Equity Risk Premium (ERP)	4,4%	4,8%	6,9%	**5,9%**	4,8%	6,9%	**5,9%**
Cost of Equity (C_E)	14,3%	9,4%	16,1%	**10,5%**	9,6%	16,2%	**10,7%**
Other parameters							
Tax rate (t)	16,0%	16,0%	16,0%	**16,0%**	16,0%	16,0%	**16,0%**
Gearing (G)	39,1%	42,7%	37,7%	**40,2%**	35,0%	34,1%	**34,5%**
WACC							
Nominal pre-tax WACC	12,6%	9,5%	16,7%	**10,7%**	10,0%	17,1%	**11,1%**

Recommended value for fixed-line WACC: 10.7%
Recommended value for mobile WACC: 11.1%

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List of comparable companies (peer group) (1/2)

Company list	Used for calculation of fixed WACC ?	Used for calculation of mobile WACC?	Used by ANCOM?
GO P.L.C.	Yes	Yes	No
TEO LT, AB	Yes	Yes	Yes
Bulgarian Telecommunications Company AD	Yes	Yes	No
TELEKOM SLOVENIJE, d.d.	Yes	Yes	Yes
SONAECOM - S.G.P.S. S.A.	No	Yes	No
Hrvatski Telekom d.d.	Yes	Yes	No
Elisa Corporation	No	Yes	No
MOBISTAR S.A.	No	Yes	No
Magyar Telekom Telecommunications Public Limited Company	Yes	Yes	Yes
Telefonica Czech Republic, a.s.	No	Yes	Yes
TDC A/S	Yes	Yes	Yes
Portugal Telecom, SGPS, SA	No	Yes	Yes
TELEKOMUNIKACJA POLSKA SPOLKA AKCYJNA	Yes	Yes	Yes
Tele2 AB	No	Yes	No

List of comparable companies (peer group) (2/2)

Company list	Used for calculation of fixed WACC ?	Used for calculation of mobile WACC ?	Used by ANCOM?
Telekom Austria Aktiengesellschaft	Yes	Yes	Yes
HELLENIC TELECOMMUNICATIONS ORGANIZATION S.A.	Yes	Yes	Yes
BELGACOM S.A.	Yes	Yes	Yes
Swisscom Ltd.	Yes	Yes	No
TeliaSonera Aktiebolag	Yes	Yes	Yes
TELENOR ASA	Yes	Yes	No
Koninklijke KPN N.V.	Yes	Yes	Yes
BT GROUP PLC	Yes	Yes	Yes
Telecom Italia SpA	Yes	Yes	Yes
VIVENDI S.A.	No	Yes	No
FRANCE TELECOM S.A.	Yes	Yes	Yes
VODAFONE GROUP PUBLIC LIMITED COMPANY	No	Yes	No
Telefonica S.A.	Yes	Yes	Yes
Deutsche Telekom AG	Yes	Yes	Yes
UPC	Yes	No	No

29 companies are used in the peer group and all companies used by ANCOM are in the peer group