ARERA
Autorità di Regolazione per Energia Reti e Ambiente

Criteri per la determinazione e l'aggiornamento del tasso di remunerazione del capitale investito dei settori elettrico e gas nel II PWACC

Presentazione del DCO 308/2021/R/com

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AGENDA

- INTRODUCTION
- LENGTH AND STRUCTURE OF REGULATORY PERIOD
- CRITERIA FOR WACC CALCULATION
  - General approach
  - Return on equity
  - Cost of debt
  - Tax values and gearing
  - Tax adjustment factor

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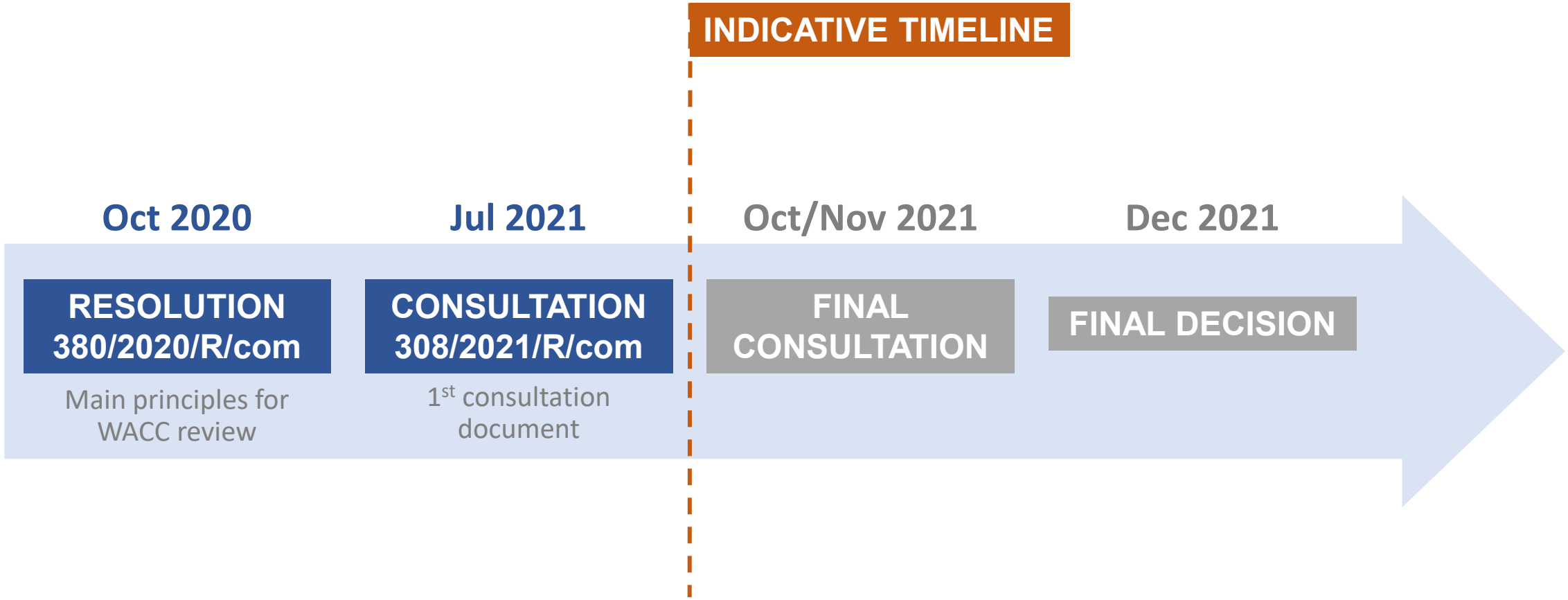
INTRODUCTION



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LENGTH AND STRUCTURE OF REGULATORY PERIOD

LENGTH OF REGULATORY PERIOD

ARERA Resolution 380/2020/R/com: at least 4 years. Other EU regulators: mostly between 3 and 5 years (some longer). ARERA proposal: **6 years (2022-2027)**.

WITHIN-PERIOD UPDATES

To mitigate risks and uncertainties

Parameter	Frequency of updates	
	HP A	HP B
Nominal risk-free rate (RF), inflation rate included in risk-free rate (isr), expected inflation (ia), Country Risk Premium (CRP), iBoxx index, Forward Premium (FP)	2-year (for 2024 and 2026)	3-year (for 2025) For years 2023 and 2024, also on yearly basis with trigger mechanism. For years 2026 and 2027, either update with trigger or no update
Tax values	2-year (for 2024 and 2026)	3-year (for 2025)
Total Market Return (TMR), Transaction costs component (ADD), weights of new and old debt (φ), Uncertainty Premium (UP)	No within-period update	
β, *gearing*	According to the regulatory framework specific for each service	

HP B: Deal with current macroeconomic context of uncertainty.
Possible yearly update with trigger mechanism for years 2023 and 2024

Update is triggered only in case of relevant changes in the resulting WACC value.

For years 2026 and 2027: to be evaluated according to the macroeconomic context (if more stable, no updates)

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CRITERIA – General approach

PROPOSED APPROACH

Confirm the current general approach

$$\mathbf{W}^{\mathbf{real}}_{\mathbf{pre-}tax} = \mathbf{Ke}^{\mathbf{real}} \cdot \frac{(\mathbf{1} - \mathbf{g}\ )}{(\mathbf{1} - \mathbf{T}\ )} + \mathbf{Kd}^{\mathbf{real}}_{\mathbf{p}} \cdot \frac{\mathbf{g}_{\mathbf{p},s} \cdot (\mathbf{1} - \mathbf{tc}\ )}{(\mathbf{1} - \mathbf{T}\ )} + \mathbf{F}$$

where:

- Ke^{real} is the real return on equity;
- Kd^{real} is the real cost of debt;
- T is the tax rate;
- tc is the tax shield;
- g is the gearing level;
- F is the correction factor to account for taxation on nominal profits.

Pre- vs post-tax approach

ARERA has always employed a real, pre-tax approach, by making assumptions on sectoral tax rates and applying sectoral averages for all operators. Such approach is:

- **consistent with the overall approach in most regulatory services**, where parameters are set based on sectoral averages and are not company-specific
- **easier to implement** as it avoids company-specific modelling, which would be extremely difficult in services with a high number of operators, such as distribution
- **in line with the approach employed by most European regulators**

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  - Correction factor

Risk free rate (RF)
Beta parameter
Equity Risk Premium (ERP)
Country Risk Premium (CRP)

CRITERIA – Return on equity

PROPOSED APPROACH

Confirm the current approach for determination of cost of equity

$$Ke^{real} = RF + \beta^{asset} \cdot \left[1 + (1 - tc) \cdot \frac{g}{1 - g}\right] \cdot (TMR - RF) + CRP$$

- risk-free rate
- Beta *levered*
- Equity Risk Premium
- Country Risk Premium

Capital asset pricing model

CRITERIA – Return on equity – Risk free rate (RF)

$$Ke^{real} = \mathbf{RF} + \beta^{asset} \cdot \left[1 + (1 - tc) \cdot \frac{g}{1 - g}\right] \cdot (TMR - RF) + CRP$$

CURRENT APPROACH

Real-term risk-free rate, inflation-adjusted from the nominal value:

$$RF = max\left(\frac{RF^{nominal} - isr}{1 + isr}; 0{,}5\%\right)$$

- $RF^{nominal}$ based on 1-year average yields of 10-year AA-rated government bonds in the Eurozone
- *isr* based on 1-year average inflation-indexed swaps
- floor at 0,5% to counter the ECB monetary policies

RF is currently 0,5% (floor)

ASSESSMENT

Current macroeconomic context of expansionary policy of European Central Bank → Negative real-term (sometimes even nominal terms) yields of government bonds.

From a theoretical perspective: not sustainable in the long-term (hence the floor) → But need to adapt to the empirical evidence.

CONVENIENCE PREMIUM

Private investors are not necessarily able to borrow money at the same rate States do with sovereign bonds.
Introduce a **Convenience Premium (CP)**, estimated as the difference between government bond yields and high-rated company bonds, **valued at around 1%.**

FORWARD PREMIUM

Higher volatility of government bond yields → Current yields not necessarily representative of future yields.
Introduce a **Forward premium (FP)**, based on forward curves consistent with RF frequency of update.

UNCERTAINTY PREMIUM

Uncertainties over government bond yields → Risk that they will increase at higher rate than what implied by forward curves.
→ Possible financing issue.
→ **Uncertainty Premium (UP)**

CRITERIA – Return on equity – Risk free rate (RF)

$$Ke^{real} = \mathbf{RF} + \beta^{asset} \cdot \left[1 + (1 - tc) \cdot \frac{g}{1 - g}\right] \cdot (TMR - RF) + CRP$$

PROPOSED APPROACH

$$RF = \frac{RF^{nominal} - isr}{1 + isr} + \frac{CP + FP + UP}{1 + ia}$$

where:

- $RF^{nominal}$ is the nominal risk-free rate
- isr is the inflation rate included in government bonds
- CP is the Convenience premium
- FP is the Forward premium
- UP is the Uncertainty premium
- ia is the expected inflation according to ECB

How to deal with inflation

Confirm the current approach
→ Consider the inflation rate included in government bonds, based on the average of 10-year inflation-indexed swap rates in the Eurozone

The average has to be calculated over a period consistent with the RF.

CRITERIA – Return on equity – Beta parameter

$$Ke^{real} = RF + \beta^{asset} \cdot \left[1 + (1 - tc) \cdot \frac{g}{1 - g}\right] \cdot (TMR - RF) + CRP$$

CURRENT APPROACH

Estimate based on data from companies in highly-rated countries in the Eurozone. Period of analysis: at least 2-year.

Companies performing activities other than regulated business can also be included for reference.

To derive the levered beta ($\beta^{levered}$) from the asset beta (β^{asset}) the following simplified formula (with no debt-beta), based on Modigliani-Miller, is used:

$$\beta^{levered} = \beta^{asset} \cdot \left(1 + (1 - tc) \cdot \frac{D}{E}\right)$$

Service	β^{asset}	$\beta^{levered}$
Electricity transmission	0,350	0,616
Electricity distribution	0,390	0,686
Gas storage	0,506	0,891
LNG	0,524	0,922
Gas transmission	0,364	0,641
Gas distribution	0,439	0,706

Current regulatory beta values (2021)

PROPOSED APPROACH

Confirm the current approach.

Introduce **some adjustments** to reduce margin of discretion

COMPARATOR SELECTION

DATA FREQUENCY

DATA TIMEFRAME

INDEXS ELECTION

CRITERIA – Return on equity – Equity risk premium (ERP)

$$Ke^{real} = RF + \beta^{asset} \cdot \left[1 + (1 - tc) \cdot \frac{g}{1 - g}\right] \cdot (TMR - RF) + CRP$$

CURRENT APPROACH

Equity Risk Premium (ERP) is currently determined as the difference between a real Total Market Return (TMR) – based on long-term historical data – and the real RF.

The real TMR is a weighted average (20% / 80%) of the geometric and arithmetic averages for AA rated countries in the period from 1900 to 2014. **The resulting TMR value was 6%, ERP was 5,5%.**

PROPOSED APPROACH

Confirm the current approach.
Weight of the arithmetic average no less than 80%.

Updated TMR values. Source: Oxera on data from Dimson, Marsh e Staunton 1900-2020.

Country	Geometric average	Arithmetic average
Belgium	2,59%	5,19%
France	3,29%	8,10%
Germany	3,39%	5,89%
The Netherlands	5,06%	7,12%
Average	3,58%	6,58%
Italy	2,13%	6,01%

CRITERIA – Return on equity – Country risk premium (CRP)

$$Ke^{real} = RF + \beta^{asset} \cdot \left[1 + (1 - tc) \cdot \frac{g}{1 - g}\right] \cdot (TMR - RF) + \mathbf{CRP}$$

CURRENT APPROACH

A Country Risk Premium (CRP) is added when calculating the return on equity to account for the RF being based on high-rated bonds but Italy being a low-rated country.

The value was set based on two different approaches:

- the spread of Italian utility bonds relative to utility bonds in highly rated countries
- taking into account the relative volatility of different national equity markets

Parameter	*2016-2018*	*2019-2021*
Country Risk Premium	1,0%	1,4%

ASSESSMENT

The current approach is complex and entails a degree of discretion.

PROPOSED APPROACH

To increase transparency and simplicity, ARERA suggests to change the approach.

The CRP would be estimated as the yield on Italian government bonds minus the average yield on the government bonds of Germany, France, Belgium and Netherlands.

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CRITERIA – Cost of debt

CURRENT APPROACH

The cost of debt (Kd^{real}) is currently set by adding, to the RF, a spread to take account of the higher yields of corporate bonds compared to government bonds (Debt Risk Premium, DRP) and the CRP:

$$Kd^{real} = RF + DRP + CRP$$

The DRP has been set at 0,5%, based on an assessment of the actual cost of debt for a subset of operators.

ASSESSMENT

Need for better adaptation of cost of debt to the changing macroeconomic conditions.
Gradual approach, based on market-based conditions, consistently with the actual cost of debt of regulated businesses.

PROPOSED APPROACH

- Distinction between existing and new debt
- New debt as sum of:
  - Spot average of the iBoxx A and BBB, 7–10 and 10+ series
  - Forward Premium
  - Uncertainty premium
- Existing debt as 10-year average of the iBoxx A and BBB, 7–10 and 10+ series
- Additional element to cover transaction costs

$$Kd_{p,s}^{real} = \frac{\left((iBoxx_p^{spot} + FP + UP) \cdot \varphi_{new} + iBoxx_p^{10y} \cdot \varphi_{old} + ADD\right) - ia}{1 + ia}$$

- SPOT AVERAGE OF THE IBOXX A AND BBB, 7–10 AND 10+ SERIES + FORWARD PREMIUM + UNCERTAINTY PREMIUM
- WEIGTH OF NEW DEBT
- INFLATION
- 10-YEAR AVERAGE OF THE IBOXX A AND BBB, 7–10 AND 10+ SERIES
- WEIGTH OF OLD DEBT
- TRANSACTION COSTS

CRITERIA – Cost of debt

$$Kd_{p,s}^{real} = \frac{\left((iBoxx_p^{spot} + FP + UP) \cdot \varphi_{new} + iBoxx_p^{10y} \cdot \varphi_{old} + ADD\right) - ia}{1 + ia}$$

iBOXX INDEX

iBoxx A and BBB → consistent with yields of Italian utility bonds
iBoxx 7-10 and 10+ → to proxy the average maturity of the Italian utility bonds analysed

WEIGHT OF EXISTING AND NEW DEBT

Weigths of existing and new debt have to be set by considering

- The share of debt to be yearly refinanced
- The frequency of within-period cost of debt update

Under the assumption of 10% yearly refinancing, and 2-year update, the weight of new debt would be 10%.

TRANSACTION COSTS

Additional component (ADD) covers for transaction costs related to emission of new debt. Values should be around 0,20%.

FORWARD PREMIUM and UNCERTAINTY PREMIUM

Same values used for RF

CRITERIA – Cost of debt

$$Kd_{p,s}^{real} = \frac{\left((iBoxx_p^{spot} + FP + UP) \cdot \varphi_{new} + iBoxx_p^{10y} \cdot \varphi_{old} + ADD\right) - ia}{1 + ia}$$

DEBT BETA

European regulators usually assume debt beta to be equal to zero.
No consensus over the best estimation methodology. The resulting value would be, in any case, negligible (between 0 and 0,05).

ARERA does not foresee the introduction of a debt beta.

SMALL COMPANY PREMIUM

Empirical evidence in the past did not show any need to include premia for small businesses, as cost of debt was not found to be significantly correlated with the company dimension.

Recent data confirm such findings.

ARERA does not foresee the introduction of a Small Company Premium.

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CRITERIA – Tax values and Gearing

TAX VALUES

CURRENT APPROACH

The Tax rate (T) and Tax shield (tc) are based on analysis of actual taxation.

Parameter	*2016-2018*	*2019-2021*
Tax rate (T)	34,4%	31,0%
Tax shield (tc)	27,5%	24,0%

PROPOSED APPROACH

Tax shield: confirm the current value of 24%, corresponding to the IRES tax.
Tax rate: ARERA is undergoing an assessment of the actual tax rate in years 2019-2020, taking into account possible evolution of fiscal policies.

GEARING

CURRENT APPROACH

Gearing levels have been set with the target of bringing the values closer to those applied by other European regulators
Should be not higher than 0,5.

Gearing levels	2016-2018	2019-2021
Gas distribution and metering	37,5%	44,4%
Other services	44,4%	50,0%

PROPOSED APPROACH

- Confirm the current approach
- Keep gearing as a sector-specific parameter
- Values will be updated in the context of each service regulatory framework update

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CRITERIA – Tax adjustment factor

CURRENT APPROACH

The tax adjustment factor is a corrective factor that adjusts the real pre-tax WACC allowance to cover taxes paid on nominal profits.
This adjustment is needed because the tax term is applied to the real Cost of Equity and the real Cost of Debt in the WACC formula, while in reality companies pay taxes on nominal profits.

$$F = \frac{ia}{1 + ia} \cdot \left(\frac{T - tc \cdot g}{1 - T} \right)$$

PROPOSED APPROACH

Confirm the current approach

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Thank you
for your attention