United Arab Emirates

هيئة تنظيم الاتصالات TRA
TELECOMMUNICATIONS REGULATORY AUTHORITY

ANNEXURE to Determination No. (2) of 2012

Etisalat's Regulated Weighted Average Cost of Capital

Issue Date: 1st of July 2012

Telecommunications Regulatory Authority (TRA)
P O Box 26662, Abu Dhabi, United Arab Emirates (UAE)
www.tra.gov.ae

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1. Executive Summary

1.1 The TRA has identified the weighted average cost of capital (WACC) as being the most appropriate and widely accepted method of calculating the regulated cost of capital. The WACC represents a rate of return sufficient to compensate all investors, both equity and debt providers, for the risk they bear by making an investment in a particular entity.

1.2 Through use of a range of different methodologies for estimating the various WACC parameters, the TRA has calculated regulated WACCs for Etisalat's fixed and mobile networks for a range of input parameters.

1.3 The results of the study are summarized in the tables below.

Table 1: Overview Results Fixed Network

Etisalat - Fixed Network:			
Optimal gearing:	**Range:**		**Recommended:**
Inputs:	**Low:**	**High:**	
Risk free rate	2.99%	3.19%	3.07%
Debt risk premium	1.12%	1.12%	1.12%
Equity risk premium	5.00%	6.00%	5.75%
Asset beta	0.51	0.94	0.73
Weight of debt	30.00%	33.00%	31.34%
Weight of equity	70.00%	67.00%	68.66%
Income tax rate	50.00%	50.00%	50.00%
Calculations:			
Equity beta	0.62	1.18	0.89
Cost of debt pre-tax	4.11%	4.31%	4.19%
Cost of debt post-tax	2.06%	2.16%	2.10%
Weight of debt	30.00%	33.00%	31.34%
Cost of equity	6.42%	10.25%	8.20%
Weight of equity	70.00%	67.00%	68.66%
Outputs:			
post-tax WACC	**4.87%**	**7.58%**	**6.29%**
pre-tax WACC	**9.74%**	**15.16%**	**12.57%**

Source: TRA Analysis

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Table 2: Overview Results Mobile Network

Etisalat - Mobile Network:			
Optimal gearing:	**Range:**		**Recommended:**
Inputs:	**Low:**	**High:**	
Risk free rate	2.99%	3.19%	3.07%
Debt risk premium	1.12%	1.12%	1.12%
Equity risk premium	5.00%	6.00%	5.75%
Asset beta	0.60	0.94	0.77
Weight of debt	30.00%	33.00%	31.34%
Weight of equity	70.00%	67.00%	68.66%
Income tax rate	50.00%	50.00%	50.00%
Calculations:			
Equity beta	0.73	1.18	0.95
Cost of debt pre-tax	4.11%	4.31%	4.19%
Cost of debt post-tax	2.06%	2.16%	2.10%
Weight of debt	30.00%	33.00%	31.34%
Cost of equity	6.66%	10.25%	8.54%
Weight of equity	70.00%	67.00%	68.66%
Outputs:			
post-tax WACC	**5.28%**	**7.58%**	**6.52%**
pre-tax WACC	**10.56%**	**15.16%**	**13.04%**

Source: TRA Analysis

1.4 The TRA has derived the following WACC ranges:

- For Etisalat's fixed network, a pre-royalty (pre-tax) WACC range of 9.74% to 15.16% for the estimated optimal gearing levels.
- For Etisalat's mobile network, a pre-royalty (pre-tax) WACC range of 10.56% to 15.16% for the estimated optimal gearing level.
- For each of the individual WACC parameters, the TRA has selected a single point estimate. Using these point estimates to calculate an overall WACC yielded the following WACC proposals:
- For Etisalat's fixed network, a pre-royalty (pre-tax) WACC of 12.57%; and
- For Etisalat's mobile network, a pre-royalty (pre-tax) WACC of 13.04%.

2. WACC Methodology Framework

2.1 Etisalat, as a regulated operator, should be allowed to recover the appropriate opportunity cost of efficiently made long-term investments into its fixed and mobile networks. This rate of return, however, should not be excessive and should not result in market distortions.

2.2 Therefore, the regulated WACC needs to reflect the underlying principles of "long-term efficiency", "forward-looking approach" and "international- investor perspective".

2.3 The "long-term efficiency" principle means that a regulated operator should be allowed to recover the appropriate opportunity cost of efficiently made long-term investments into its network. Regulated operators should not be compensated for operational, financial or structural inefficiencies.

2.4 The "forward-looking" principle refers to the fact that WACC is to be used as an input to cost-based interconnection pricing for use of long-term telecommunication networks and therefore should not be biased by short-term past fluctuations and should reflect expectations of future developments.

2.5 The "international investor perspective" principle assumes that country specific factors are negligible due to diversification. The underlying logic is that the regulated company owners should be compensated only for risk that cannot be eliminated by international diversification (regulatory systematic risks), and not for local country-specific risks.

2.6 The post-tax WACC is defined as:

$$WACC_{post-tax} = r_E * \frac{E}{(E+D)} + r_D * (1-T) * \frac{D}{(E+D)}$$

Where:

r_E = Return on equity, i.e. rate of return expected by shareholders

r_D = Cost of debt, i.e. rate of return requested by creditors

E = Value of equity used by company

D = Value of debt used by company

T = Corporate income tax rate

2.7 As telecommunication operators need to cover their income tax obligations over and above the return expected by their shareholders and the cost of debt requested by their creditors, the pre-tax WACC is relevant for regulatory purposes.

2.8 The pre-tax WACC is derived from post-tax WACC using the following formula:

$$WACC_{pre-tax} = \frac{WACC_{post-tax}}{1-T}$$

2.9 The calculation of the rates of return based on a WACC methodology as outlined above is a globally accepted standard and extensively used by regulators worldwide. This approach will therefore also be used by the TRA.

2.10 In the following chapters the methodology behind the calculation of each of the WACC input parameters is discussed.

3. Risk Free Rate

3.1 The risk free rate (Rf) represents the expected return on a theoretical financial asset that bears no risk at all. In real life no such asset exists. The risk free rate is used as an input for an appropriate pre-tax cost of debt (rD) which is calculated as follows:

$r_D = Rf + DRP$

Where:

Rf = Risk free rate

DRP = Debt risk premium

3.2 For the calculation, high-quality government bonds could be used as a proxy for such a risk free investment opportunity. The yield to maturity (YTM) of these freely traded investment grade bonds is generally seen as the best proxy for the risk free rate.

3.3 When deriving the forward-looking WACC for regulatory purposes, the current values of the risk free rate (YTM of government bonds) observed on a particular date may be temporarily distorted by seasonal variations and market anomalies.

3.4 Thus, the use of moving averages to 'smoothen' these daily values is a frequently applied and accepted method of dealing with these short-term fluctuations. It is also consistent with the principle that the WACC should be based on a "long-term forward looking view" in regulatory proceedings.

3.5 The TRA considers that the appropriate time period for historical time series analysis of the YTM of a freely traded investment grade bond should be one year of historical data as this is in line with the forward-looking principle of estimating the development of risk free rate for the period of the WACC (next two years) by taking in to account market data for which bond holders/traders have embedded their future expectations in the current "price" (yield expected/requested).

3.6 In cases of actual (or expected) high inflation levels within a country where an operator has its network subject to regulation, an adjustment for inflation differentials could be considered (between the high inflation country and the inflation rate of the country issuing the bond). However, potential adjustments of this nature are not considered as being relevant by the TRA for setting a regulated WACC in the UAE due to the following reasons:

- An Inflation adjustment is not aligned with the 'international investor' perspective as regulated companies should be compensated not for local country-specific risks but only for risk that cannot be eliminated by international diversification (regulatory systematic risks).

- There is no empirical evidence of a sustained inflation differential occurring as the inflation rate in UAE has dramatically dropped since 2008 (relative to other major economies).

- There is no need to make any adjustment for any difference in inflation between the UAE and the US as the interest rate parity theorem states that If any country maintains a fixed exchange rate with another country, then its interest rate must equal the other country's interest rate, (*ceteris paribus*).[1] Any difference in interest rates between the two countries would create an arbitrage opportunity which would be eliminated by achieving interest rate parity.

- For the expected regulatory period of the WACC of Etisalat in UAE (next 2 years), there is unlikely to be large inflation differentials therefore, no inflation differential related adjustment is needed. This is in line with IRG/ERG principles.

TRA approach

3.7 The TRA has performed extensive research aimed at identifying bonds that comprise an appropriate proxy for the risk free rate asset.

[1] The UAE maintains a fixed exchange rate between the dirham and US$ (relevant currency because of US long-term bond as proxy for risk free asset as explained later), thus the interest rates should be close to equal (*ceteris paribus*).

3.8 Bloomberg does not report a risk free rate for the UAE, claiming there are no appropriate government bonds issued at the Federal UAE level. It is therefore necessary to identify an alternative bond. The United States generic 10 year government bond US yield (USGG10YR:IND) is internationally perceived as an appropriate proxy for the risk free rate. The TRA views this instrument as the most suitable proxy for the following reasons:

- Its 10-year maturity corresponds with the minimum investment horizon of Etisalat in the domestic market and with the technical lifetime of its telecommunication network assets;
- US Government bonds are ranked with the highest investment grade[2] AAA (by Fitch), and Aaa (by Moody's), thus indicating a close-to-zero default risk;
- US bonds are freely traded fixed-income instruments in large volumes, indicating immaterial liquidity risk; and
- There are no appropriate emissions denominated in AED (local UAE currency).

3.9 The TRA analyzed daily yield data (YTMs) for the last rolling year using both current and historical methods.

Current (last) observation

3.10 The "last observation" method theoretically derives the most accurate expectation of the risk free rate. However, the fluctuations in daily values over different observation periods are not immaterial, as can be seen in the table below.

[2] Standard & Poor's (S&P) downgraded the US Government bonds by one grade to AA+ in August 2011 citing the unpredictability of the United State's fiscal policy. There is only a limited number of countries with the highest rating (AAA by S&P or Fitch) - Germany, Norway, Switzerland, Canada, Australia, France, and Great Britain. The first three countries in particular are still perceived by the financial community as being risk free. Thus, the TRA has performed an additional analysis of these bonds confirming that US bonds still could be used as appropriate risk free proxy.

Table 3: Risk Free Rate (YTM of US Bond) – Current (last) observation

Observation Period:	Risk Free Rate:
30.09.2010	2.510%
03.01.2011	3.332%
31.03.2011	3.470%
30.06.2011	3.160%
29.07.2011	2.796%

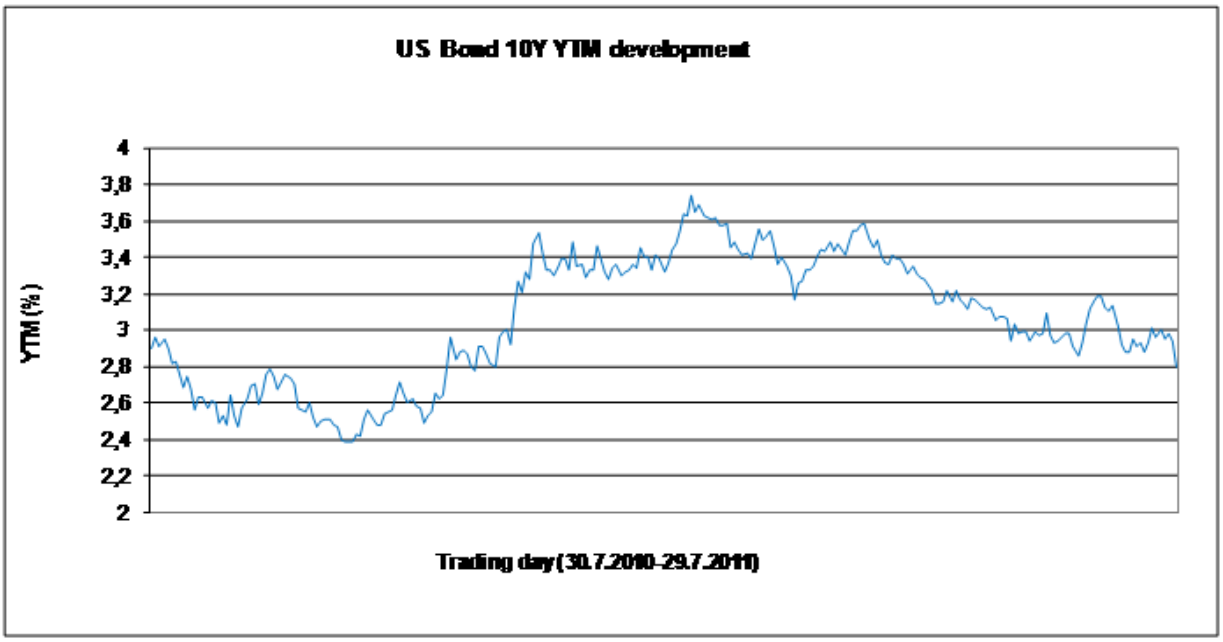
Source: Bloomberg (TRA analysis)

Historical observation (averaging)

3.11 Whenever data are available, the historical average method can be used to smoothen out temporal fluctuations and the effects of business cycles. For time series data, the moving average method is commonly applied as a method for smoothening out short-term fluctuations and identifying long-term trends.

3.12 The calculation of a forward-looking risk free rate was carried out based on a moving average of YTM values for each trading day over the period from 30 July 2010 to 29 July 2011. The movement of the YTM of the chosen US Government bond is illustrated in the chart below.

Figure 1: US Bond (10 Years Maturity) YTM development



Source: Bloomberg (TRA analysis)

3.13 In the analysis, four different periods of moving averages are taken into account. Our analysis of the underlying data resulted in the following averages for the risk free rate:

- Based on 3-month moving average: Risk-free rate = 2.990%
- Based on 6-month moving average: Risk-free rate = 3.193%
- Based on 9-month moving average: Risk-free rate = 3.068%
- Based on 12-month moving average: Risk-free rate = 3.069%

3.14 The results reveal fluctuations in the YTM (as a proxy for the risk free rate) in the range of 2.990% to 3.193%.

3.15 The issue of which timeframe to base the risk free rate on also needs to be considered. It should be noted that there is no generally accepted "optimal time frame" and observed approaches by regulators worldwide show no clear preference for any particular time frame. However, some general statements can be made.

3.16 It is usually accepted that shorter time frames give the market's best estimates of current and future rates since they incorporate the latest events. Shorter time frames, therefore, are of a more forward looking nature than historical long run averages.

3.17 However, the shorter the time frame chosen, the more distorted the rates are likely to be by recent events. If capital markets were perfectly efficient, current yields would reflect all expectations of future earnings and the appropriate measure would clearly be the current yield. However, capital markets have proven to not be perfectly efficient and sometimes heavily distorted, particularly in the short run. Therefore, the strong sensitivity of markets to short term distortions can significantly bias the results.

3.18 The TRA therefore decided to use the 9-month moving average on the basis that it represents a favorable trade-off between the advantages and disadvantages of shorter time periods while adequately incorporating the requirement for the WACC to be based upon a forward looking approach.

3.19 Additional calculations show that both the arithmetic average and median are within the range indicated by using moving averages:

- Based on 12-month arithmetical average: Risk-free rate = 3.058%
- Based on 12-month median: Risk-free rate = 3.074%

Sanity check - other AAA government bonds (Germany, Norway, Switzerland)

3.20 In light of the fiscal ceiling increase in the United States which resulted in Standard & Poors (S&P) downgrading US government bonds to AA+ from AAA in August 2011, the TRA performed additional analysis of other government bonds with AAA ratings that are still perceived by financial community as being risk free. The results of this analysis are summarized in the table below.

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Table 4: AAA Government Bonds (10 Years Maturity) YTM development

Gov Bond 10YR YTM analysis (30.7.2010-29.7.2011)	Arith. average 12 mths	Median 12 mths	Moving average 3 mths	Moving average 6 mths	Moving average 9 mths	Moving average 12 mths	Low	High
USA	3.06%	3.07%	2.99%	3.19%	3.07%	3.07%	2.38%	3.74%
AAA rated bonds:								
Germany	2.86%	2.96%	2.89%	3.08%	3.03%	2.86%	2.12%	3.49%
Norway	3.52%	3.47%	3.26%	3.54%	3.54%	3.48%	2.81%	3.94%
Switzerland	1.68%	1.70%	1.65%	1.81%	1.79%	1.69%	1.05%	2.16%
Average (3 peers)	2.69%	2.71%	2.60%	2.81%	2.79%	2.67%	1.99%	3.19%
Median (3 peers)	2.86%	2.96%	2.89%	3.08%	3.03%	2.86%	2.12%	3.49%
Average (2 peers excl. Switz.)	3.19%	3.22%	3.08%	3.31%	3.28%	3.17%	2.47%	3.71%
Median (2 peers excl. Switz.)	3.19%	3.22%	3.08%	3.31%	3.28%	3.17%	2.47%	3.71%

Source: Bloomberg (TRA analysis)

3.21 The values of US bonds (based on arithmetical average, median, moving averages, low and high values) are within the range of the German and Norwegian bonds. Swiss bonds show historically very low YTMs as these are perceived by fixed income investors as being a "safe haven".

3.22 Based on these findings, the TRA is comfortable that the YTM of US 10-year bonds comprise an appropriate proxy of the risk free rate.

3.23 As stated above the TRA determined that an inflation differential is not necessary in the TRA's calculation of the risk free rate due to the following reasons:

- International investor's perspective" - local specifics are irrelevant because the ability for an investor to diversify through a balanced global portfolio exists;
- The UAE maintains a fixed exchange rate between the dirham and USD, thus the interest rates should be theoretically equal (*ceteris paribus*)[3];

[3] based on the **interest rate parity theorem**:

$$(1.) \qquad 1 + r_{UAE} = \frac{F_{AED,USD}}{S_{AED,USD}} \times (1 + r_{US})$$

where r_{UAE} = the interest rate in the UAE, r_{US} = the interest rate in the US, $F_{AED,US}$ = the futures contract exchange rate between the UAE and the US and $S_{AED,US}$ = the current spot exchange rate between the UAE and the US.

- There is no empirical evidence of a significant sustaining inflation differential as the inflation rate in the UAE has dramatically dropped since 2008 to a level of inflation that is comparable to the inflation level in the United States (2009: 1,6% (UAE) to -0,3% (USA); 2010: 0,9% (UAE) to 1,6% (USA);[4] and

- There is no reliable data indicating that the UAE economy will have high levels of inflation in the next two years.

3.24 When reaching its final conclusion on the risk free rate, the TRA determined that a country risk premium (CRP) should not be added to the risk free rate in this instance[5] for three main reasons:

- The appropriate debt risk premium (described in the Cost of Debt section) used for a regulatory WACC represents an estimate of corporate spreads for corresponding industry and maturity rating grades, and are derived from a large data sample that is regularly updated;

- The results of pre-tax cost of debt derived via debt risk premium (described in the Cost of Debt section) are in the range of results derived via the YTM of relevant UAE corporate bonds (where a CRP is included in "price" of bond financing- i.e. yields requested by bond holders - see Table 7 in the Cost of Debt chapter); and

- The principles of an international investor's perspective" determines that local specifics are irrelevant because these could be diversified in a balanced global portfolio.

Equation (1.) says that $r_{UAE} > r_{US}$, if and only if $F_{UAE,US} > S_{UAE,US}$. However, the UAE maintains a fixed exchange rate between the dirham and the US dollar. In this case $F_{AED,US} = S_{AED,US}$ and $r_{UAE} = r_{US}$. If any country maintains a fixed exchange rate with another country, then its interest rate must equal the other country's interest rate, *ceteris paribus.*

[4] Central Intelligence Agency (CIA) – "The World Factbook: Inflation rate (consumer prices) for United Arab Emirates and United States.

[5] In the determination of Etisalat's WACC in 2010 the TRA included a country risk premium due to the restrictions on foreign ownership of shares traded on ADSE, making it a possibility that UAE or GCC nationals may not hold globally diversified portfolios.

Conclusion

3.25 The TRA used a generic 10-year US government bond to derive the risk free rate for the UAE market due to the following reasons:

- Its 10-year maturity corresponds with the minimum investment horizon of Etisalat in the domestic market and with the technical lifetime of telecommunication network assets;
- US Government bonds are ranked with the highest investment grade of AAA by Fitch, and Aaa by Moody's, indicating close-to-zero default risk; and
- US bonds are freely traded fixed-income instruments in sufficient volumes, indicating immaterial liquidity risk.

3.26 There is no inflation differential adjustment needed in the WACC calculation for Etisalat in the UAE for the period of the determination (2 years).

3.27 The analysis of the last rolling year of historical data is an appropriate period and is in line with the forward-looking principle to estimate the development of the risk free rate over next two year period.

3.28 Following the USA downgraded by S&P the TRA analysed the YTM of other relevant governmental 10 years bonds finding that the YTM of US bonds is in the compared range and thus can be used as appropriate proxy for the derivation of the risk free rate.

3.29 A country risk premium (CRP) should not be added to the risk free rate in this instance.

3.30 The historical approach (moving average method) which involves analyzing the YTM of 10 year US government bonds provides a risk free rate estimate in the range of 2.99% to 3.19%. In terms of a single point estimate of the WACC, the TRA recommends that a risk free rate of 3.07% be used. This figure is based on a 9-month moving average which represents a favorable trade-off between shorter time periods and need for the WACC to reflect a long-term forward looking approach. This figure is very close to mid-point of the recommended range as well as the 12-month arithmetical average and median.

4. Cost of Debt

4.1 The pre-tax cost of debt in the WACC calculation represents the return required by company creditors for the provision of long term debt.

TRA approach

4.2 When deriving the pre-tax cost of debt, the TRA followed two methods that are commonly applied by regulators worldwide and widely accepted by the financial community:

- Direct derivation from the YTM of existing long-term bonds of issuers with the corresponding rating grade; and
- Derivation via adding the appropriate debt risk premium (DRP) to the risk free rate.

4.3 Additional cross checks against a selected range of regulatory benchmarks have also been performed.

4.4 When reaching its final conclusion, the TRA decided to prioritize the cost of debt values derived via adding the DPR to the risk free rate and performed sanity checks by comparing the results of the direct derivations against the YTMs of peer bonds.

4.5 The TRA's decision to derive the cost of debt by using a DRP and the risk free rate is in line with IRG's guidance which defines the derivation of the efficient cost of debt using the debt risk premium as one of "Best Practice" methods[6].

4.6 Although the TRA acknowledges that the YTM approach is also viable in that a strong correlation between the YTM and the respective bond ratings exist, the dependence on market conditions, and the influence of other aspects embedded in a fixed income investors' evaluation, devalues this approach somewhat.

[6] IRG – Regulatory Accounting- Principles of Implementation and Best Practice (PIB) for WACC calculation (2007): "this approach ensures that the cost of debt is forward-looking and, therefore, avoids transitional effects, such as temporary holdings of debt."

4.7 The specific steps used by the TRA to derive the cost of debt using the two approaches are described below.

Approach 1: Derivation of the cost of debt from bonds with corresponding rating grades

4.8 The TRA notes that there are currently no appropriate long-term bonds issued by Etisalat with YTMs that could be analyzed to directly derive the cost of debt. The TRA, therefore, identified the following bonds that could be used in the WACC calculation:

Table 5: Peer bonds for direct derivation of pre-tax cost of debt

Issuer, issue number	Type of bond:	ISIN RegS:	ISIN 144A:	Maturity (years):	Settlem. date:	Maturity date:	Cpn:	Ccy:	Rating:		
									S&P	Moody's	Fitch
Etisalat Corporation									AA-	Aa3	A+
Abu Dhabi, 2019	Eurobond-cpn bond	XS0422754258	US29134UAB70	10	Apr 08 2009	Apr 08 2019	6.75%	USD	AA	Aa2	AA
Mubadala Development, 2019	Eurobond-cpn bond	XS0426993571	US55276VAB80	10	May 6 2009	May 06 2019	7.63%	USD	AA	Aa2	AA
Nat. Bank of Abu Dhabi, 2020	Eurobond-cpn bond (sukuk)	MYBPN1000552		10	Dec 28 2010	Dec 28 2020	4.90%	MYR (Malay. ringitt)	A+	Aa3	AA-
Lloyds Tsb Bank Plc , 2015		XS0517466198		5	Sep 7 2010	Sep 7 2015	5.38%	GBP	A+	Aa3	AA-

Source: TRA analysis

4.9 As shown in the table above, each of these bonds are within a similar range of Etisalat's investment grade ratings of AA- by S&P, Aa3 by Moody's, and A+ by Fitch.

4.10 As shown in the table below, the YTMs of the selected peer bonds have been in the range of 3.64% (the lowest "low") to 5.16% (the highest "high") over the period from 30 July 2010 to 29 July 2011.

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Table 6: Direct pre-tax cost of debt calculation – YTM of peers bonds overview

Issuer, issue number	Arith. average 12 mths	Median 12 mths	Moving average 3 mths	Moving average 6 mths	Moving average 9 mths	Moving average 12 mths	Low	High	S&P Rating	Compared to Etisalat
Abu Dhabi, 2019	4.124	4.052	3.899	4.186	4.175	4.141	3.749	4.770	AA	one grade higher
Mubadala Development, 2019	4.684	4.648	4.605	4.678			4.357	4.962	AA	one grade higher
National Bank of Abu Dhabi, 2020	4.695	4.650	4.678	4.740			4.440	4.930	A+	one grade lower
Lloyds Tsb Bank Plc , 2015	4.345	4.257	4.001	4.292	4.454	4.338	3.642	5.160	A+	one grade lower
Average (4 peers)	4.462	4.402	4.296	4.474	4.314	4.239	4.047	4.956		
Median (4 peers)	4.515	4.453	4.303	4.485	4.314	4.239	4.053	4.946		
Low (4 peers)	4.124	4.052	3.899	4.186	4.175	4.141	3.642	4.770		
High (4 peers)	4.695	4.650	4.678	4.740	4.454	4.338	4.440	5.160		

Source: Bloomberg (TRA analysis), older information for Mubadala and National Bank of AD not available.

4.11 Based on the results of the analysis of the YTM of peer bonds, the TRA has attempted to determine which YTM value would be appropriate for Etisalat (as a proxy for its pre-tax cost of debt). When using peer YTM arithmetical average, median and 9 and 12-month moving average figures, the pre-tax cost debt range would amount to between 4.24% and 4.52%. When using a 9 month moving average of the YTM of peers (to be consistent with risk-free rate derivation), the pre-tax cost of debt range would be between 4.175% and 4.454%.

4.12 Different rating grades of bonds are not always perfectly reflected in correspondingly different YTMs. To illustrate, the 12 month arithmetical averages (4.684% and 4.695%) and medians (4.648% and 4.650%) of Mubadala and the National Bank of Abu Dhabi respectively are very close to each other, despite their ratings differing by two grades. This finding signals that fixed income investors embed in their "valuation" a range of other factors that might include, for example, the type of bond, emission, or bond issuer.

Abu Dhabi bond

4.13 The TRA identified the Abu Dhabi government bond XS0422754258 (ISIN Reg.S.) denominated in USD, as being the most suitable proxy for the following reasons:

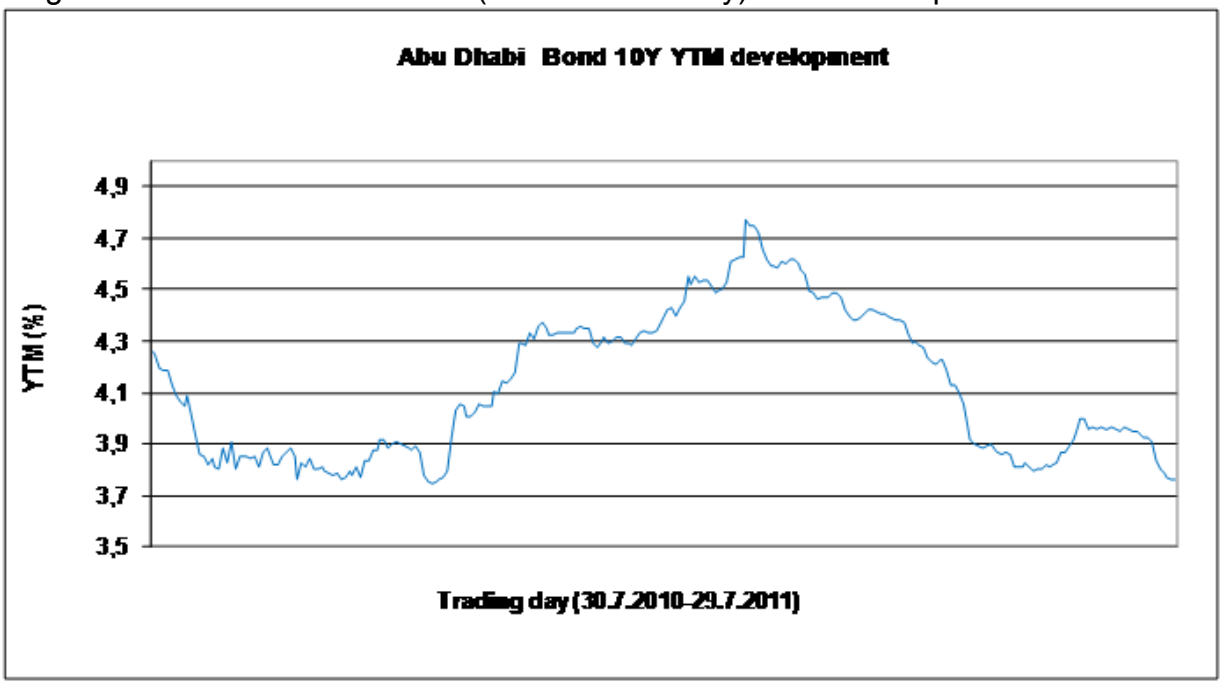
- Its 10 years maturity corresponds with the minimum investment horizon of Etisalat in the domestic market and with the technical lifetime of telecommunication network assets;

- It is ranked with the investment grade/ outlook AA/Stable by Fitch and S&P, and Aa2/Stable (by Moody's). In the TRA's view, the differences between these grades and Etisalat's grades are immaterial; and

- Its maturity date of 2019 is sufficiently distant that its YTM values will not be distorted by an approaching maturity date.

4.14 The TRA then analyzed daily yield data (YTMs) for the last rolling year using both current and historical methods. The development of the YTM of the selected Abu Dhabi bond is illustrated in the chart below.

Figure 5: Abu Dhabi Bond 2019 (10 Years Maturity) YTM Development



Source: Bloomberg (TRA analysis)

4.15 The "last observation" method theoretically derives the most accurate expectation of the cost of debt. However, fluctuations in daily values over different observation periods are not immaterial, as shown in the table below.

Table 7: Abu Dhabi bond YTM – Current (last) observation

Observation Period:	Cost of Debt:
30.09.2010	3.794%
03.01.2011	4.351%
31.03.2011	4.484%
30.06.2011	3.962%
29.07.2011	3.759%

4.16 To counter these fluctuations, for time series data the moving average method is commonly applied to smoothen out short-time fluctuations and the effects of business cycles, and for identifying long-term trends.

4.17 The calculation of a forward-looking cost of debt rate was therefore carried out based on a moving average of YTM values on each trading day over the year from 30 July 2010 to 29 July 2011. The development of the daily YTM values of the Abu Dhabi bond is illustrated in figure 5 above.

4.18 For our analysis, the TRA took four different moving average periods into account. From the available data, the derived results are as follows:

- Based on 3-month moving average: Cost of debt = 3.899%
- Based on 6-month moving average: Cost of debt = 4.186%
- Based on 9-month moving average: Cost of debt = 4.175%
- Based on 12-month moving average: Cost of debt = 4.141%

4.19 The results reveal fluctuation in the YTM (as a proxy for the cost of debt) in the range of 3.90% to 4.19%.

4.20 Additional calculations show that the arithmetic averages and medians over the last 12 months are in the range indicated by the moving averages:

- Based on 12-month arithmetic average: Cost of debt = 4.124%
- Based on 12-month median: Cost of debt = 4.052%

4.21 The historical approach (moving average method) which involves analyzing the YTM of the 10 year Abu Dhabi government bond provides a forward looking cost of debt estimate in the range of 3.90% to 4.19%.

4.22 In order to arrive at a single point estimate of the WACC, the TRA recommends that a cost of debt estimate for this approach of 4.18% is used. This figure is based on a 9-month moving average which represents a favorable trade-off between shorter time periods and need for the WACC to reflect a long-term forward looking approach. This figure is very close to the mid-point of the recommended range as well as the 12-month arithmetical average and median.

Approach 2: Derivation of the cost of debt using the debt risk premium

4.23 The most up-to-date long-term issue credit rating for Etisalat is AA- which was issued by S&P. For this rating class and industry, Bondsonline/ Reuters indicate a spread (debt risk premium) of 0.99% (99 basis points (bps)) for a 10-year maturity. A full overview of spreads from this resource is provided in table 27 of the Appendix to this document[7].

4.24 Prof. Damodaran (New York Stern University, January 2011) reports values of AA and A+ by S&P, indicating a spread range of 0.65% - 0.85%, although specific industry and maturity information is not provided.

4.25 Taking this information into account, the pre-tax cost of debt (Rd) for Etisalat's observed gearing levels (6.21%) can be estimated by using the following formula:

$$R_D = Rf \text{ (risk free rate)} + DRP \text{ (debt risk premium)}$$

Where

Rf = 2.99% - 3.19% (the recommended range proposed in the previous chapter); and

[7] The Bondsonline/ Reuters was selected as the most relevant for regulatory purposes because of a number of relevant advantages compared to other sources (industry and maturity specific, sufficient sample, weekly regularly updated). Appropriateness of this input to cost of debt derivation was checked via direct derivation via analysis of YTM of corporate bonds, where time series of one year have been analyzed (smoothening via moving averages etc. to avoid exactly short-term fluctuations).

DRP = 0.99% (the Reuters figure for an AA- rating with a 10 year maturity) as the appropriate spread for Etisalat's observed gearing.

4.26 This indicates a range for the cost of debt of 3.98% to 4.18% based on Etisalat's actual gearing levels. In order to arrive at a single point estimate of the WACC, the TRA proposes that 4.06% be used as the cost of debt. This figure is based upon an Rf value of 3.07% and a DRP of 0.99%.

4.27 In general, the relevant DRP for a particular company depends on its gearing ratio. An increase in a company's debt level (and gearing ratio) results in a higher DRP. With increasing gearing, the default risk as perceived by rating agencies also increases. The methodologies used by rating agencies are based on interest coverage and credit repayment ratios and assume that these ratios decrease with increased gearing. As the company's rating grade will correspond to a relatively narrow range of interest coverage and credit repayment ratios, the company rating could be subject to reclassification if this ratio worsens. Such a downgrade would lead lenders to demand higher spreads and thus higher costs of debt. An exact quantification of these dynamics is, however, situation-specific and depends on the financier in question.

4.28 In the chapter on financial gearing (Chapter 8), the TRA propose the optimal theoretical Etisalat gearing level in the range of 30%-33%, i.e. substantially higher than actual (observed) gearing level of 6.21%.

4.29 For Etisalat's "optimal" gearing ratio of between 30% and 33%, the TRA considers a credit spread (DRP) of 1.12% to be appropriate. The DRP value is set to 1.12% which corresponds with the spread allocated by Reuters to rating class A1/A+ and a 10 year maturity. The TRA has applied this conservative approach assuming that with 30 to 33% gearing, Etisalat's rating would be downgraded by one grade and the spread increased accordingly. In sum, using the same formula as above, this gives:

- Rf = 2.99% - 3.19% (the recommended range proposed in the previous chapter); and
- DRP = 1.12% (based on the Reuters figure for an A+ rating with a 10 year maturity) for Etisalat's "optimal" gearing levels.

4.30 This indicates a range for the cost of debt (based on Etisalat's "optimal" gearing) of 4.11% to 4.31%. In order to enable a single WACC figure to be derived rather than a range, the TRA proposes using 4.19% as the input the cost of debt in the overall calculation. This is based on an Rf value of 3.07% and a DRP of 1.12%.

4.31 The DRP ranges applied above for both observed and optimal gearing levels based on Reuters' inputs are reasonably close to the range provided by IRG (0.75 for gearing up to 20% and 1.00 as the lower limit for gearing ranges of 30% to 50%).

4.32 Furthermore, the cost of debt range derived via the DRP corresponds with the cost of debt derived via the direct method (i.e. the YTM of bonds with the same or similar ratings grades).

Conclusion

4.33 The TRA considers that deriving the cost of debt values by adding the DRP to the risk free rate is the most appropriate approach to use. In using this methodology, the TRA has performed sanity checks by comparing the results of the direct derivation method with the YTMs of peer bonds.

Table 8: Pre-tax cost of debt derivation overview

Pre-tax cost of debt derivation:			
Via DRP added on top of the risk free rate:	**Low**	**High**	**Single Point of Estimate**
Etisalat optimal gearing	4.11%	4.31%	4.19%
Etisalat observed gearing	3.98%	4.18%	4.06%
Via YTM analysis of 4 peer bonds (9 month moving average):	**Low**	**High**	**Average/ Median**
Etisalat (not gearing level specific)	4.18%	4.45%	4.31%

4.34 For "observed", i.e. lower gearing levels, the TRA proposed a pre-tax range cost of debt amounting to between 3.98% and 4.18%. As a single-point estimate, the TRA proposes 4.06% (based on the recommended Rf value of 3.07% and DRP of 0.99%).

4.35 For "optimal", i.e. higher gearing levels, the TRA proposes a pre-tax range of cost of debt amounting to between 4.11% (based on an Rf of 2.99% and a DRP of 1.12%) and 4.31% (based on an Rf of 3.19% and a DRP of 1.12%). As a single-point estimate, the TRA proposes 4.19% (based on an Rf value of 3.07% and DRP of 1.12%).

4.36 As the pre-tax WACC should be based upon optimal/ efficient gearing levels, the pre-tax cost of debt estimate used as an input into the WACC calculation should also be based on optimal/ efficient gearing levels. Therefore, the TRA proposes using a pre-tax cost of debt of 4.19% for the WACC calculation.

4.37 The recommended values are valid for both Etisalat's fixed and mobile WACC calculations, as the capital structure of Etisalat cannot be appropriately split by only fixed and only mobile.

5. Market Risk Premium

5.1 The Market Risk Premium is used as an input for an appropriate return of equity derivation (RE) which is calculated as follows:

$R_E = MRP^* \beta + Rf$

Where:

Rf = Risk free rate

MRP = Market risk premium

β = Equity Beta

5.2 The Market Risk Premium (MRP), also referred to as the Equity Risk Premium (ERP), represents the expected rate of return on stocks (Rm) in excess of the risk-free rate (Rf) and is a core element of the WACC calculation based on the CAPM formula. The excess return can be explained by the fact that investments in equity markets are generally considered more risky than investments in Government bonds, since they carry a systematic risk which cannot be eliminated through diversification. The excess return is therefore the compensation investors require for accepting the systematic risk associated with investments in the market portfolio as a whole.

5.3 The equation for the MRP can be expressed as follows:

$MRP = Rm - Rf$

Where:

Rm = Return on stock market
Rf = Risk-free rate of return

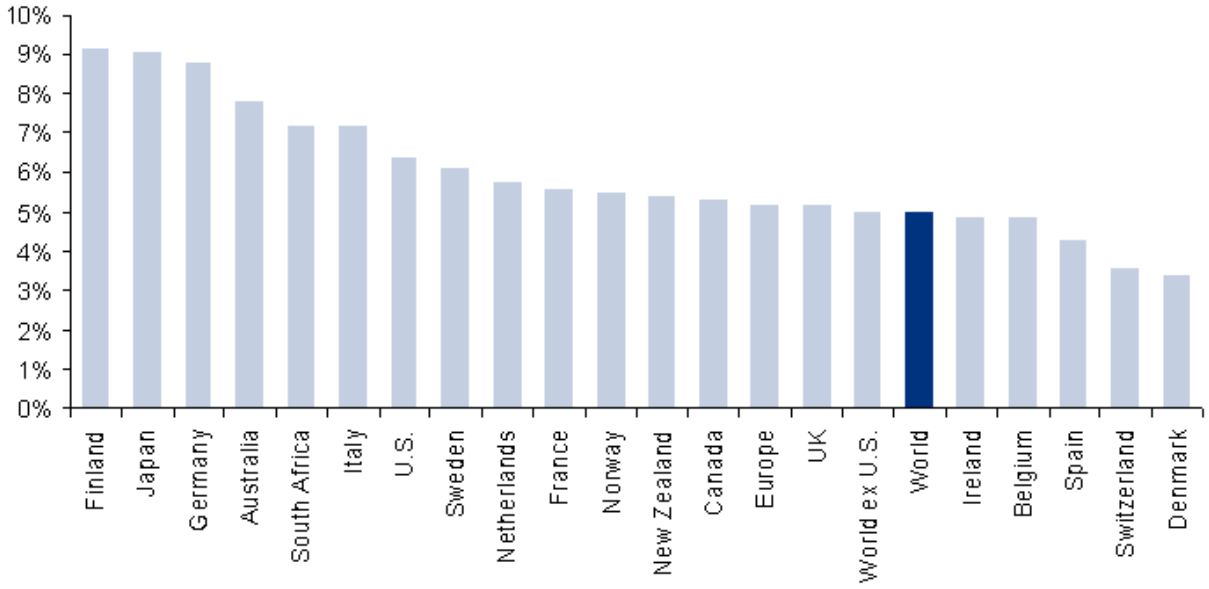
TRA Approach

5.4 The TRA has used an historical as well as a survey approach to derive the MRP.

Approach 1: Analysis of Historical Market (Equity) Risk Premiums

5.5 In order to estimate the MRP via long-run historical risk premiums, the TRA analysed a number of sources. Figure 6 below shows the results of one of the most comprehensive and commonly used studies for regulatory purposes: the Credit Suisse Global Investments Return Sourcebook in cooperation with the London Business School (Dimson, Marsh & Staunton), which dates back to 1900 and is updated annually.[8]

Figure 6: Historical Global Market (Equity) Risk Premiums 1900 – 2010



Source: Credit Suisse Global Investments Return Sourcebook 2011

[8] The underlying dataset is the DMS dataset in association with Morningstar.

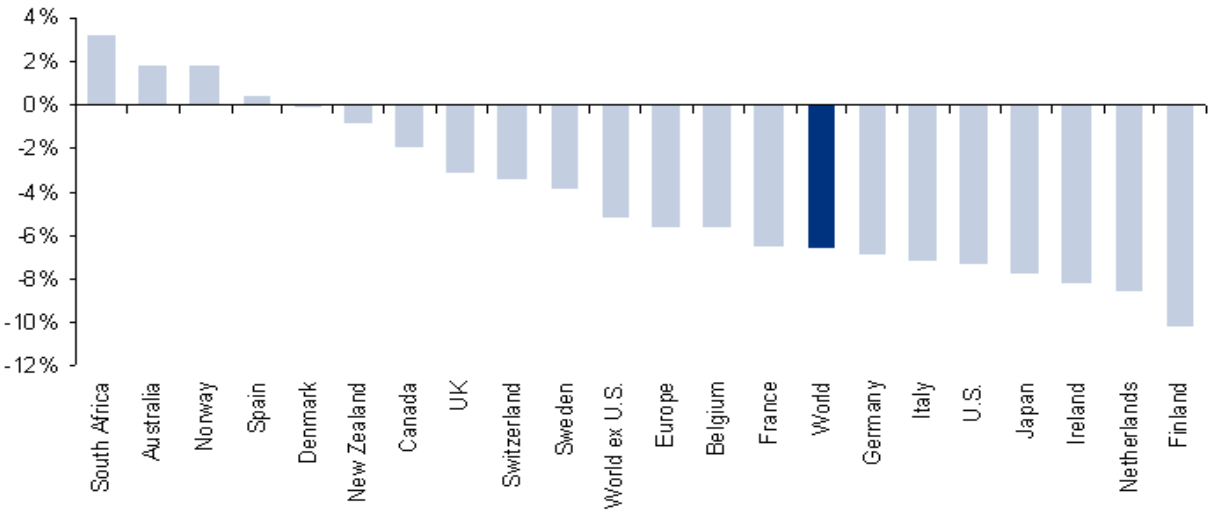
5.6 As previously set out, the use of longer term periods with regards to historical MRPs is advantageous due to significantly lower standard errors. When observing the MRP for shorter periods, single events and market shocks can heavily influence the results and lead to high levels of volatility which can reduce the usefulness of the data for regulatory purposes. Dimson, Marsh & Staunton (hereinafter DMS) conclude:

> "*It would be just misleading to project the future equity premium from data for the previous decade. Inferring the expected equity premium from returns over such a short period would be nonsense: investors cannot have required or expected a negative return for assuming risk*"[9]

5.7 This supports the TRA's view that it is appropriate to use long-run historical data as proxy for the estimation of the MRP.

5.8 The case is further supported by the next two charts which show the extreme volatility in the short term MRP.

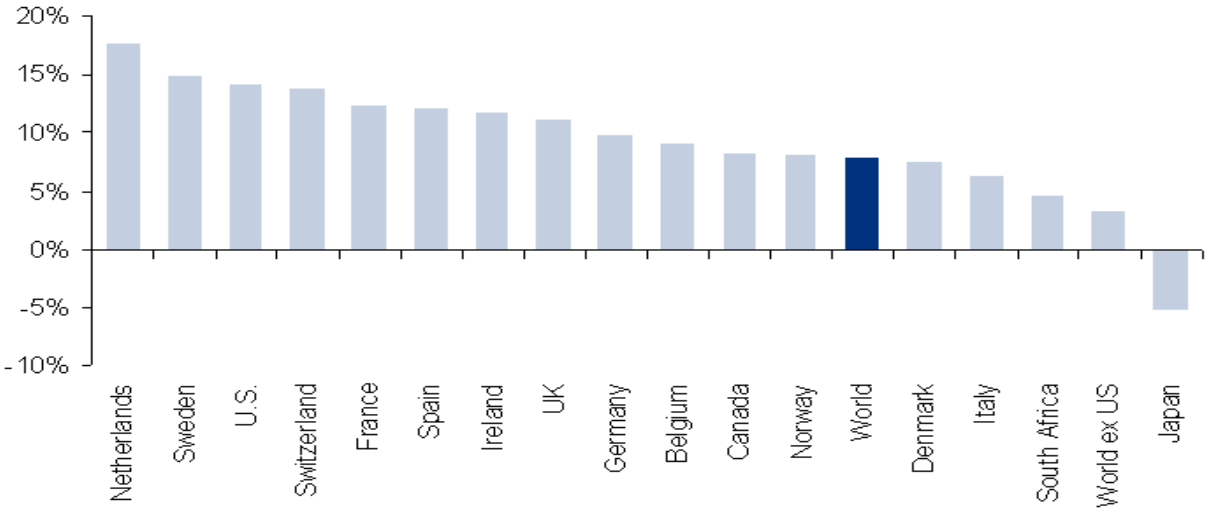
Figure 7: Global Market (Equity) Risk Premiums 2000 – 2009



Source: Credit Suisse Global Investments Return Yearbook 2010

9 Dimson, Marsh, Staunton, "THE WORLDWIDE EQUITY PREMIUM: A SMALLER PUZZLE" (2006)

Figure 8: Global Market (Equity) Risk Premiums 1990 – 1999



Source: Dimson, Marsh & Staunton (2002)[10]

5.9 As the charts above demonstrate, the majority of international stock markets witnessed significantly negative MRPs during the period from 2000 to 2009. This is a pattern that can be found in almost every study observing MRPs over such periods. Notably, the market shocks of the last decade and the most recent crisis have biased the risk premiums over shorter periods and have affected longer observation periods.

5.10 When comparing figures 7 and 8 which both cover a 10 year period, two significantly different pictures of MRP become evident. While in 1990 the worldwide stock market boom led, with the exception of Japan, to high positive risk premiums, in contrast during 2000 to 2009 most markets showed highly negative risk premiums.

[10] Dimson, Marsh, Staunton, "THE WORLDWIDE EQUITY PREMIUM: A SMALLER PUZZLE" (2006).

ANNEXURE to Determination No. (2) of 2012 - Etisalat's Regulated Weighted Average Cost of Capital, issued 1st of July 2012

Table 9: Global Market (Equity) Risk Premiums

Country	1900 - 2004	1900 - 2005	1900 - 2006	1900 - 2010
Australia	7.80%	7.81%	8.00%	7.80%
Belgium	4.20%	4.37%	4.60%	4.90%
Canada	5.60%	5.67%	5.70%	5.30%
Denmark	3.00%	3.27%	3.40%	3.40%
Finland	N/A	N/A	N/A	N/A
France	5.80%	6.03%	6.20%	5.60%
Germany	8.30%	8.35%	8.50%	8.80%
Ireland	5.10%	5.18%	5.40%	4.90%
Italy	7.70%	7.68%	7.80%	7.20%
Japan	9.70%	9.98%	9.90%	9.10%
Netherlands	5.80%	5.95%	6.10%	5.80%
New Zealand	N/A	N/A	N/A	N/A
Norway	4.20%	5.26%	5.50%	5.50%
South Africa	6.80%	7.03%	7.30%	7.20%
Spain	4.10%	4.21%	4.60%	4.30%
Sweden	7.30%	7.51%	7.70%	6.10%
Switzerland	3.10%	3.28%	3.40%	3.60%
UK	5.20%	5.29%	5.40%	5.20%
U.S.	6.60%	6.49%	6.60%	6.40%
Europe	N/A	N/A	N/A	5.20%
World ex US	N/A	N/A	N/A	5.00%
World	**5.10%**	**5.15%**	**5.20%**	**5.00%**

Source: ABM AMRO Global Investments Return Yearbook (2005 & 2006), Credit Suisse Global Investments Return Sourcebook (2011), Damodaran," Equity Risk Premium (ERP): Determinants, Estimation & Implications"

5.11 As shown in table 8 above, the ABN AMRO Yearbook of 2007 calculates a worldwide market (equity) risk premium "World ERP", comprising a series of 19 countries, of 5.20% (1900 – 2006[1112]). However, in contrast, a 2011 study (Credit Suisse Sourcebook) by the same authors, using the same methodology and dataset calculated a worldwide risk premium of 5.00% which is a drop of 20 basis points.

5.12 There are several challenges as to which time period and which index to choose when deciding upon an MRP. The TRA has decided to use a long-term historical worldwide MRP in order to ensure the calculated WACC follows the principles of "international investor view" and "long-term forward-looking".

[11] The calculation of this "World" ERP is not just a simple average, but requires several side calculations. For each period, the respective local currencies need to be transferred into one common currency (usually US dollars). A weighting for each country by size also needs to be taken into account. The final step involves an adjustment for inflation to arrive at real terms. The figure below gives the relative sizes of the world stock markets as used for the calculation of the "World" ERP (Source: Credit Suisse Global Investment Returns Sourcebook 2011).

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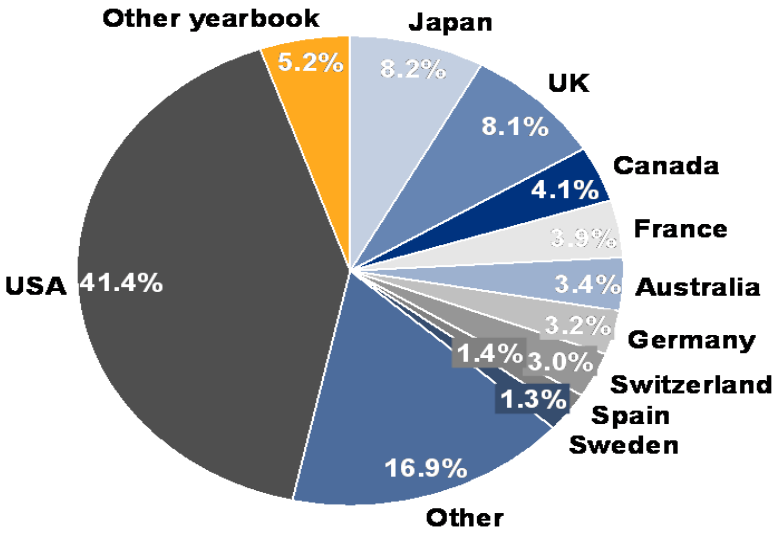

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5.13 When selecting the appropriate time period for the blended worldwide MRP, it is important to ensure the observation period is sufficiently large to include both positive and negative market movements. Using too short a time period can produce a highly inaccurate picture of the real MRP due to market volatilities, and would therefore invalidate the inputs into the WACC calculation.

5.14 To get a more comprehensive picture of the long-term historical MRP, the TRA reviewed several studies from other renowned authors/ theoreticians. The results can be found in the table below.

Table 10: Different Historical Risk Premiums by Different Authors, time period 1926-2005

HEP vs LT Gov.bond (average)	Ibbotson	Shiller	Wiliam & Jones	Damodaran	Siegel
Geometric	4.90%	5.50%	4.40%	5.10%	4.60%
Arithmetic	6.50%	7.00%	5.80%	6.70%	6.10%

Source: Fernandez (IESEE Business School)-WP661 (2006)- Equity Premium- Historical, Expected, Required and Implied

5.15 As illustrated in Table 9, the estimates of these theoreticians are mostly higher than the historical averages in Table 8 and higher again than the survey estimates of 2400 financial practitioners by Fernandez (described in detail in the survey approach methodology below, Table 10).

5.16 After reviewing the data and taking into account the drawbacks and shortcoming of the short-term historical approach and the worldwide tendency towards declining MRP's, the TRA considers the latest observation from 2010 (for the period from 1900 to 2010) of 5.00% is considered as the appropriate lower bound of the range. For the upper bound, the TRA considers 6.00%, which reflects higher arithmetical average estimates of theoreticians, as the appropriate estimate for the MRP used in the WACC calculation. The range of 5% and 6% and the implied spread of 100 bps (1%) between the upper and lower bounds is consistent with 100 bps as the most frequent estimate shown

in the survey by Fernandez[13] (see survey approach in paragraph 6.20-6.21, Figure 13 [14]).

Approach 2: Survey Approach to estimate Market (Equity) Risk Premiums

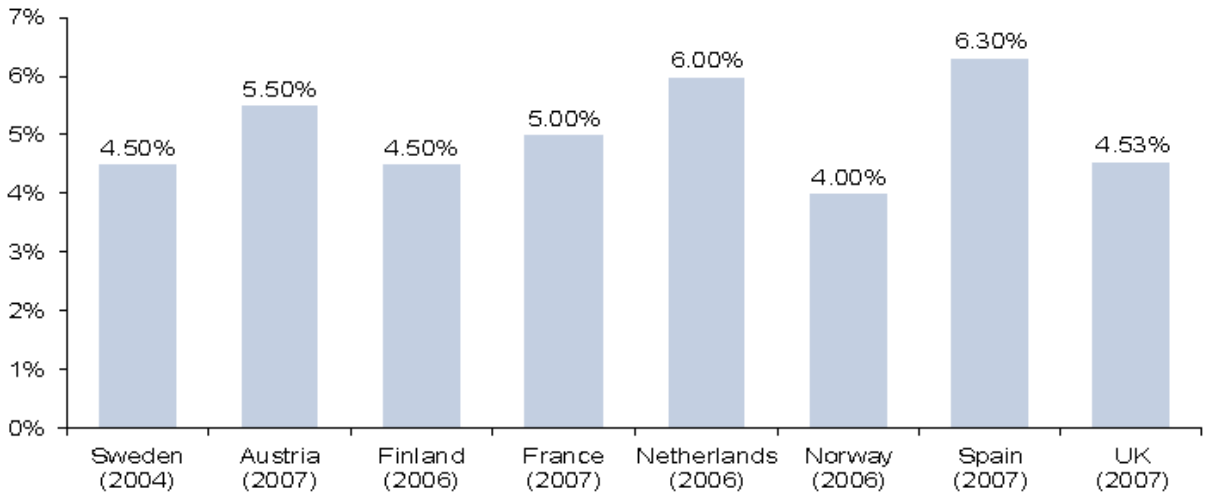
5.17 To validate the outcome of the historical analysis, the TRA has used a survey approach which, reviews:

- Past decisions made by various regulators in other countries; and
- Extensive surveys by Fernandez.

Regulator's WACCs

5.18 When analyzing the regulatory references for Europe during the period from 2004 to 2007, as figure 10 shows the ERP values range from 4.00% on the lower bound to 6.30% on the upper bound. This gives an average of 5.04% and a median of 4.77%.

Figure 10: Regulatory Reference for Equity Risk Premiums (Europe)



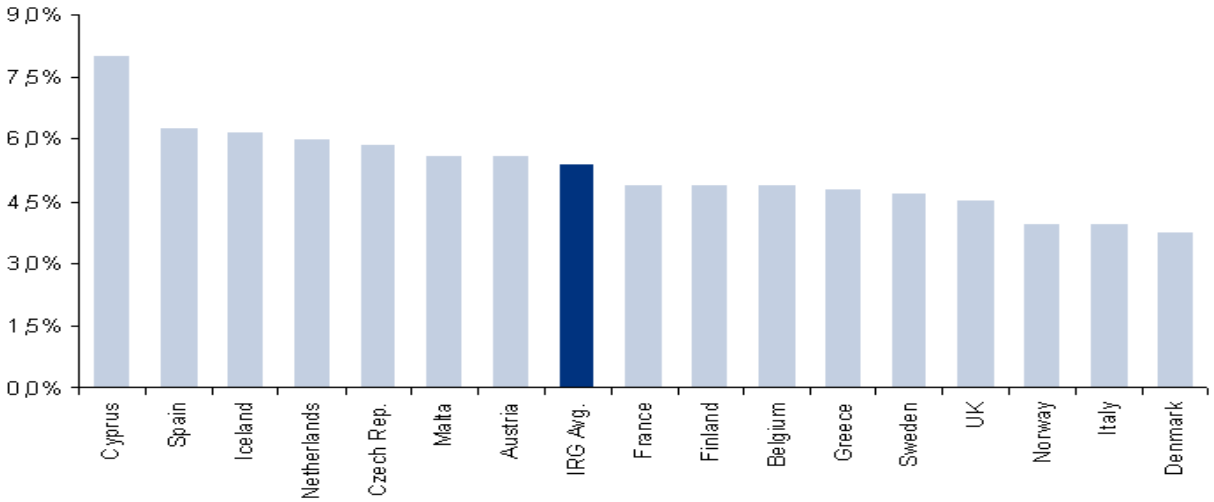
Source: ITU Expert-Level Training on Network Cost Modeling for Asia and P**acific** *Countries*

[13] Source: Fernandez, P. "The Equity Premium in 100 Textbooks" (2008).

[14] Source: Fernandez, P. "The Equity Premium in 100 Textbooks" (2008).

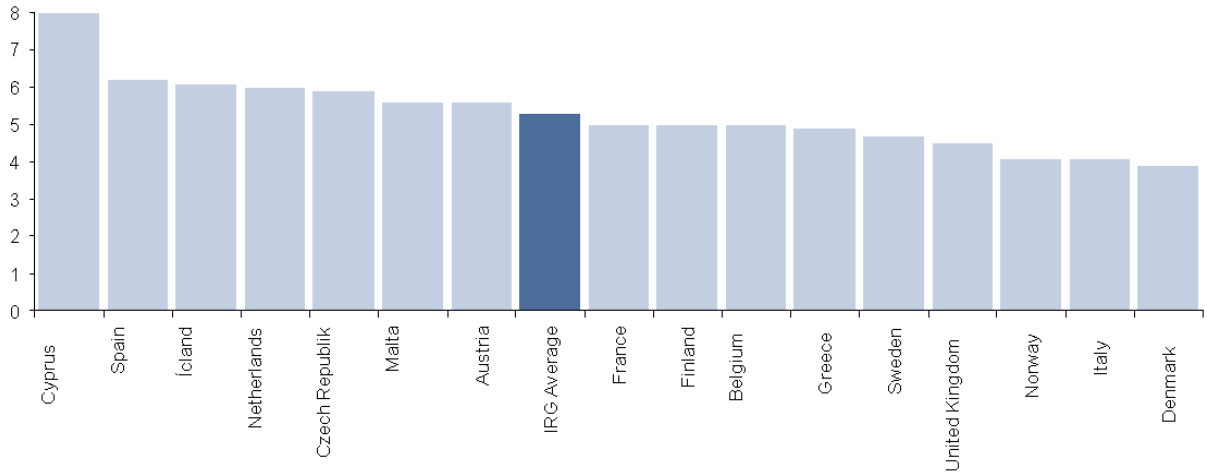
5.19 The figures above are backed by the latest available ERG report which includes some additional countries throughout Europe for fixed and mobile networks. Figures 11 and 12 show that the ERPs used in WACC calculations for fixed and mobile networks throughout Europe ranged from 3.8% as the lower bound up to 8.0% as the upper bound. The IRG average for 2008 stood at 5.45% which is in line with the TRA's historical MRP range estimate.

Figure 11: Equity Risk Premium (used in the WACC calculation for fixed networks)



Source: ERG Report "Regulatory Accounting in Practice 2008" - ERG (08) 47 final RA in Practice 081016

Figure 12: Equity Risk Premium (used in WACC calculation for mobile networks)

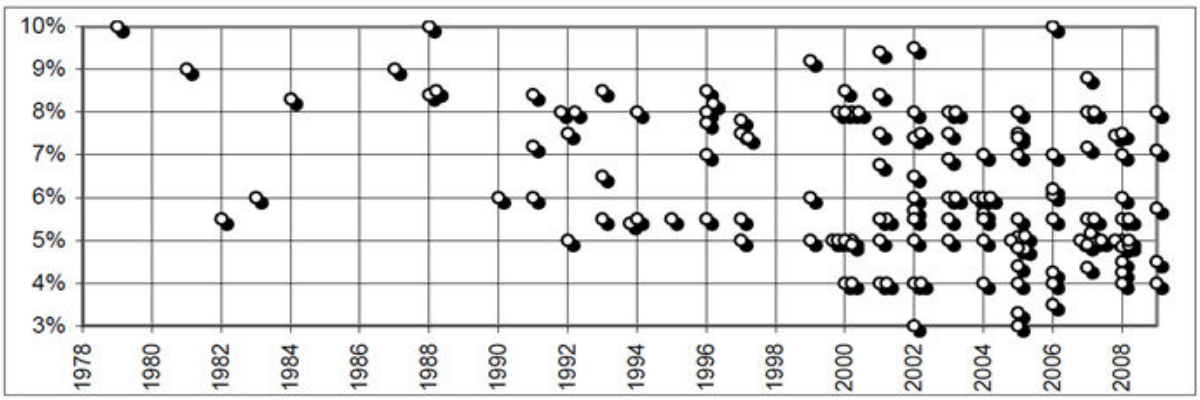


Source: ERG Report "Regulatory Accounting in Practice 2008" - ERG (08) 47 final RA in Practice 081016

Fernandez Studies

5.20 Fernandez (2008) analyzed the risk premiums given in 100 finance and valuation textbooks. This gives an aggregated overview of equity risk premiums used in finance theory. The table below provides an overview of the results.

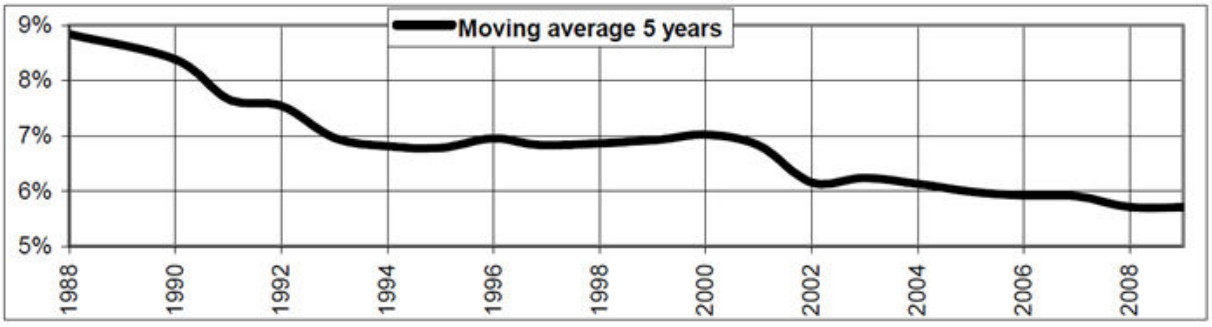
Figure 13: Evolution of Market (Equity) Risk Premium used in 100 finance or valuation textbooks



Source: Fernandez, P. "The Equity Premium in 100 Textbooks" (2008)

5.21 Fernandez's textbook survey reveals that the majority of MRPs lie within an interval of 4.00% to 6.00%, with the highest density being in the range of 5.00% to 6.00%, particularly for the most recent time periods. When looking at the distribution of MRPs over time, a trend towards lower MRPs can be observed. When using 5 year moving averages, this trend becomes more evident.

Figure 14: Evolution of Market (Equity) Risk Premium used in 100 finance or valuation textbooks (5 year moving average)



Source: Fernandez, P. "The Equity Premium in 100 Textbooks" (2008)

5.22 The 5 year moving average shows the recent drop in MRP estimates to 5.75% which is in line with the results of the historical averages, and within the TRA's proposed range for the MRP.

5.23 A further study by Fernandez, of the MRPs used by 2400 financial practitioners lends support to the TRA's range for the MRP lower bound. As table 10 shows, the results for the United States and Canada as well as Europe for the average and median lie perfectly in line with the TRA's recommendation for the lower bound.

Table 11: MRPs used by financial professionals

Key Figure	USA & Canada	Euro	UK	Other
Average	5.10%	5.00%	5.20%	6.30%
St. dev.	1.1	1.3	1.4	2.2
Max	10.00%	11.90%	10.00%	25.00%
Median	5.00%	5.00%	4.50%	5.90%
Min	2.50%	3.00%	3.50%	0.70%

Source: Fernandez, P. "The Equity Premium used by 2400 Financial Practitioners" (2010)

Local Market Risk Premium for the United Arab Emirates

5.24 As discussed throughout this document, the TRA is keen to ensure that the WACC is consistent with the "international investor's perspective" principle. Nevertheless, the local perspective also needs to be analysed to add some regional focus and to ensure that the sample of MRPs discussed above, which consist mainly of Western European countries and the United States, comprise suitable proxies for the purposes of this analysis.

5.25 One possible approach is to use historical data of mature markets and add country specific risk premiums.

Equity risk premium emerging markets = equity risk premium mature market + country specific risk premium

5.26 From a study, the TRA has calculated a total risk premium estimate of 5.75% for the United Arab Emirates[15]. This estimate[16] is derived from a 5% equity risk premium and a 0.75% country specific risk premium. Additional confirmation for the validity of this range comes from the two other regional peers, Qatar and Kuwait, both of which have a total risk premium of 5.75% with a 0.75% country risk premium.

5.27 The TRA acknowledges that this MRP should not be taken at face value. As previously pointed out in this chapter, using historical risk premiums is a valid practice but depends heavily on the availability of sufficient data points (i.e. long time periods) to reduce standard errors and produce reliable results (refer to Table 8). If, however, the TRA allows for the fact that the investor is not globally diversified, the TRA would need to introduce country specific risk premiums due to the shortcomings of the historical approach mentioned above.

Conclusion

5.28 In line with the "international investor's perspective", the TRA used a global sample as the most appropriate input for the estimation of a market risk premium. Based on a comprehensive analysis of several sources of historical MRPs, an MRP for the calculation of the WACC in the range of 5.00% to 6.00% was used. The midpoint of the range of 5.50% is very close to the IRG average (2008).

5.29 In terms of deriving a point estimate of the WACC rather than a range, the TRA used an MRP of 5.75% as the input for the calculation of the WACC. The TRA has decided to stay on the upper side of the range to accommodate the findings in its regionally focused sample which yielded slightly higher results.

[15] Damodaran: Country Default Spreads and Risk Premiums (July 2011).

[16] Damodaran: Country Default Spreads and Risk Premiums (July 2011).

6. Beta

6.1 The Equity Beta (β) of a stock describes the relationship of its returns with the returns of the financial market as a whole and is used in the calculation of the cost of equity. The beta is related to systematic risk, i.e. the market risk that cannot be eliminated by an investor via portfolio diversification.

TRA approach

6.2 The TRA followed a benchmarking approach based on five year historical data of peers, while also taking into account Etisalat's historical betas. The benchmarking results have been sanity-checked against the decisions of overseas regulators as well as IRG/ERG guidance.

6.3 Also taken into consideration was the 'divisional approach' where the beta of each separate (main) activity of a company (e.g. fixed, mobile, international, data etc) is estimated via the de-composition of the company's historical beta and weighted by the value of each activity (weights should be derived via independently fair estimated discounted free cash flow of each activity). However, this method has substantial limitations in practice and the TRA considered that setting the appropriate level for the different company's activities is a difficult and controversial process.

6.4 Aligned with ERG/IRG recommendations, the TRA calculated separate betas for fixed and mobile businesses, reflecting the perception of investors that the systematic risk of these two businesses may differ.

Benchmarking approach based on historical data of peers

6.5 The TRA assembled peer groups from selected relevant countries around the world based on the following indicators. The full sample of peers is set out in Tables 11 to 13.

- Various macroeconomic indicators including GDP per capita, GDP annual growth, etc;
- Country geography (population density, urban/ rural split, etc);
- Telecommunications market maturity (fixed lines penetration/ households, mobile SIM penetration, etc); and
- Status of market liberalisation of the telecommunication sector.

6.6 Separate peer groups were identified for:

- Integrated operators;
- Fixed only operators; and
- Mobile only operators.

6.7 The company equity betas collected were based on the observation of historical data for last 5 rolling years (in line with common practice to cover the entire business cycle). The operators were categorized according to their key business areas (fixed, mobile or integrated) within the observation period 2006-2010. For the calculation of this WACC du was considered as part of mobile only sample because within the analyzed period its key business was mobile with the TRA considering the fixed business not to be as material (in terms of revenues generated or subscribers).

Weekly observations (to avoid weekend heteroscedasticity)

6.8 Next, the TRA de-levered the collected company equity betas using country headline corporate income tax rates (or royalties) and the operator's 5 year average gearing levels to derive asset betas.

6.9 Gearing assumptions were collected based on following parameters:

- Average of the last five rolling years (corresponding with the equity beta data);
- Value of equity based on market values (if data available); and
- Value of long-term debt based on book values as a proxy of market value.

6.10 The TRA then analysed the asset betas of peers within the samples and identified the averages of the samples as being the best proxy to Etisalat's fixed-only and mobile-only networks.

6.11 The results of equity and asset beta peer analysis are summarised in the tables below.

Table 12: Betas of Integrated Players

Company	Ticker Symbol	Equity Beta (Bloomberg raw)	Asset Beta
Singtel	ST:SP	0.77	0.69
France Telecom	FTE:FP	0.55	0.36
Bahrain Telecom	BATELCO:BI	0.72	0.68
Belgacom	BELG:BB	0.41	0.36
Cable & Wireless PLC	CWC:LN	0.76	0.55
Deutsche Telekom	DTE:GR	0.67	0.40
KPN	KPN:NA	0.45	0.32
PCCW	8:HK	0.06	0.03
Qatar Telecom	QTEL:QD	0.62	0.38
Swisscom	SCMN:VX	0.55	0.40
Telekom Austria	TKA:AV	0.73	0.53
Telenet	TNET:BB	0.56	0.30
Telstra	TLS:AU	0.43	0.34
AT&T	T:US	0.75	0.58
Verizon	VZ:US	0.71	0.54
OTE	OTE:GR	0.66	0.64
Portugal Telecom	PTC:PL	0.89	0.56
Telefonica	TEF:SM	0.77	0.54
Telekom Malaysia	T:MK	0.55	0.36
Telenor	TEL.NO	0.63	0.51
Average		**0.61**	**0.45**
Median		**0.65**	**0.46**

Source: TRA Analysis, Bloomberg

6.12 Within the peer group of integrated operators, the average equity beta was 0.61 and the average asset beta of 0.45. These results indicate that systematic risk of integrated players is perceived to be lower than pure fixed or mobile-only operators, as shown below.

Table 13: Betas of Pure Fixed Players

Company	Ticker Symbol	Equity Beta (Bloomberg raw)	Asset Beta
BT Group	BT/A:LN	0.81	0.53
Iliad	ILD:FP	0.70	0.61
City Telecom HK	CTEL.O	0.77	0.57
CenturyLink Inc	CTL.N	0.65	0.45
Voxtelecom	VOXJ.J	0.44	0.39
Average		**0.67**	**0.51**
Median		**0.70**	**0.53**

Source: TRA Analysis, Bloomberg

6.13 Within the peer group of fixed only operators, the average equity beta was 0.67 and the average asset beta was 0.51.

Table 14: Betas of Pure Mobile Players

Company	Ticker Symbol	Equity Beta (Bloomberg raw)	Asset Beta
Etihad Etisalat (Mobily S.A.)	EEC:AB	0.92	0.75
Emirates Integr. Telecomm. Comp. (Du)	DU.DU	0.92	0.82
Taiwan Mobile	3045:TT	0.27	0.15
LG Uplus	032640:KS	0.36	0.28
Sprint Nextel	S:US	1.44	1.36
Hutchison	HTA:AU	0.59	0.27
Average		**0.75**	**0.60**
Median		**0.75**	**0.51**

Source: TRA Analysis, Bloomberg

6.14 Within the peer group of mobile only operators, the average equity beta was 0.75 and the average asset beta was 0.60. This indicates that the systematic risk of mobile-only businesses is perceived as being slightly higher than fixed-only businesses and integrated operators.

Table 15: Etisalat Historical Beta

Company	Ticker Symbol	Equity Beta (Bloomberg raw)	Asset Beta
Etisalat	ETISALAT:UH ETEL.AD*	0.98	0.94
	(* Reuters Ticker)		

Source: TRA Analysis, Bloomberg

6.15 As shown in the tables above, Etisalat's historically reported equity beta and derived asset beta (based on Etisalat's observed gearing levels) are high compared to the equity betas of the peer group of integrated operators. This could be caused by specific factors impacting the stock prices and should not necessarily be reflected in a WACC derived for regulatory costing purposes.

6.16 These factors could be local equity market specific (e.g. market liquidity problems, large stock price fluctuations, the composition of the stock-market index and the weight of operators in the index, limited tradability of shares, specific rules for share ownership, etc) or company specific (changes in shareholding structures, internal restructuring, changes in the business mix, corporate expansion plans, large commitments for license investments, etc.).

6.17 Therefore, the TRA proposes to adopt the following asset betas as inputs for the cost of equity calculations for Etisalat's WACC:

For Etisalat's fixed network:

- Asset beta range = 0.51 (the average of the fixed-only operator peer benchmarks) to 0.94 (the asset beta derived from Etisalat's integrated historical equity beta); and
- Asset beta point estimate recommended value = 0.73 (the mid-point of the range above).

For Etisalat's mobile network:

- Asset beta range = 0.60 ((the average of the mobile-only operator peer benchmarks) to 0.94 (the asset beta derived from Etisalat's integrated historical equity beta); and
- Asset beta point estimate recommended value = 0.77 (the mid-point of the range above).

Target approach based on survey as sanity check

6.18 The TRA performed several checks of its approach described above by comparing Etisalat's fixed-only asset betas with:

- The most up-to-date asset betas announced by Ofcom for the costing review of wholesale broadband access regulation of BT; and
- UK utilities company stocks, as examples of other less cyclical industries that were used as reference cases in Ofcom's review.

Table 16: Ofcom WACC Inputs

Ofcom- WACC inputs for WBA cost review (January 2011, based on Brattle analysis)

	Openreach (proxy for copper network based services)	BT Group	Rest of BT	UK Utilities
Asset beta (unlevered)	0.4-0.55	0.45-0.60	0.5-0.65	0.3-0.5

Source: Ofcom: Proposals for WBA charge control (Consultation document and draft notification of decisions on charge control in WBA Market)

6.19 The lower part of the fixed network asset beta range of 0.51 - 0.94 recommended for Etisalat is within the asset beta range proposed for BT's Openreach UK copper network (0.4 to 0.55) and the asset beta range of the BT Group (0.45 to 0.60).

6.20 In addition to the Ofcom data, the TRA checked the IRG and ERG reference values and found a range of fixed asset betas from 0.6 to 1.15 in its 2008 NRA survey of selected European countries (see Figure 20 in Appendix to this document).[17] When compared to the IRG's range, the TRA's proposed Etisalat fixed network equity beta range appears to be reasonable.

6.21 In terms of mobile-only asset beta ranges, the IRG and ERG report provides a range of 0.6 to 1.4. Etisalat's mobile network asset beta range is 0.60 to 0.94 as calculated by the TRA and is well within the 2008 NRA survey of selected European countries (see Figure 21 in the Appendix to this document).[18] The higher upper range reported by IRG could be caused by a different (higher) perception of systematic risk applicable to mobile businesses by some local regulators.

Conclusion

6.22 The TRA followed a benchmarking approach based on historical data of peers, considering Etisalat historical betas as well.

6.23 The benchmarking results were subsequently sanity-checked against other overseas regulatory decisions as well as IRG/ERG guidance.

6.24 Based on this analysis, the TRA used the following asset beta ranges and values:

For Etisalat's fixed network:

- Asset beta range = 0.51 (the average of the fixed-only operator peer benchmarks) to 0.94 (the asset beta derived from Etisalat's integrated historical equity beta); and
- Asset beta point estimate recommended value = 0.73 (the mid-point of the range above).

17 Calculated using Modigliani-Miller formula

18 Calculated using Modigliani-Miller formula

For Etisalat's mobile network:

- Asset beta range = 0.60 (the average of the mobile-only operator peer benchmarks) to 0.94 (the asset beta derived from Etisalat's integrated historical equity beta); and

- Asset beta point estimate recommended value = 0.77 (the mid-point of the range above).

6.25 These asset beta ranges are in line with international betas and regulatory benchmarks, but also accommodate the observed above average beta of Etisalat's group beta compared to its peers.

7. Financial Gearing

7.1 Financial gearing describes the relationship between a company's debt and equity, and forms the basis for the weighting in the WACC formula. Gearing is defined as the share of assets that are financed with interest bearing debt.

$$\text{Gearing} = \frac{D}{D+E}$$

Where:

D - Debt

E - Equity (Book or Market, depending on approach)

TRA Approach

7.2 When calculating the gearing ratio, the TRA decided upon a hybrid approach that is widely accepted in regulatory practice. For the calculation of the company's equity, the TRA used market values since it believes them to provide the most accurate proxy for true economic value. The calculations are based on data for the past five years in order to provide a long-term forward looking view and to smoothen short-term fluctuations. The TRA also compared the values against book values, although it should be noted that these normally underestimate the value of equity.

7.3 For the calculation of debt levels, the TRA used book values of the total debt as it believes that they are an appropriate proxy for the true value of debt and that the differences from market value are negligible for the purpose of this analysis. To calculate the market value of debt, the single value of each debt instrument would have to be calculated separately, which, particularly for non-traded securities, becomes challenging and can lead to estimation errors.

7.4 The definition of gearing followed by the TRA in the calculation of the WACC is fully aligned with IRG/ERG guidance and perceptions of debt from the financial community. The TRA does not consider that "net debt" should consist of:

(2.) (Short Term Debt + Long Term Debt) – Cash Balances

The TRA considers that Equation (2.) is relevant for the derivation of the equity value of a company only for purposes such as the calculation of the appropriate company value as an acquisition target. This approach is not relevant for the calculation of a regulatory driven WACC.

7.5 Using this approach, the TRA calculated Etisalat's observed gearing. Assuming that a company's actual capital structure may deviate from its long-run capital structure the TRA also calculated the five year historical average capital structure to get a longer term view of the observed gearing levels.

7.6 Finally, the TRA carried out a peer group analysis to derive the estimated ranges of optimal gearing levels. Results of peer group analysis have been compared with Etisalat's observed gearing and applied as an adequate proxy to estimate the optimal gearing level of Etisalat for a regulatory driven WACC calculation. This approach is fully aligned to the IRG guidance for NRAs relating to the derivation of the WACC for regulatory purposes.[19] The optimal or efficient gearing method was reported by IRG/ERG as the main and most frequently used method by NRAs (59%) to determine gearing levels for fixed and mobile networks[20].

7.7 The TRA's approach is fully aligned with the "long-term efficiency" principle that a regulated operator should be allowed to recover the appropriate opportunity cost of efficiently made long-term investments into its network but not compensated for operational, financial or structural inefficiencies. In using this approach the TRA does not intend to interfere with the management decision of Etisalat concerning its capital structure, rather the TRA applied the optimal/efficient gearing assumption only as the appropriate input to the estimation of a WACC for specific regulatory purposes.

Peer Group Approach

7.8 The peer group approach is based on the assumption that, on average, firms have optimal gearing ratios. To derive the optimal range of gearing, the TRA

[19] IRG – Regulatory Accounting- Principles of Implementation and Best Practice for WACC calculation (2007)- "PIB 2: In the view of IRG, the level of gearing should be determined using a method consistent with the relevant cost base and the availability of information, although some adjustments may be introduced, if required. There are number of ways to determine gearing level- based on book values, based on market values and optimal/ efficient gearing. Optimal or efficient gearing is based on an optimal capital structure defined by the regulator".

[20] ERG Report "Regulatory Accounting in Practice 2008" - ERG (08) 47 final RA in Practice 081016.

analyzed the gearing ratios of a comprehensive peer group. To mitigate the effects of the short term financing needs of a company and instead derive the "true" long term financial structure the TRA calculated the average gearing levels of the peers over the last 5 year period. Moreover, for the market value of equity, the TRA took the average of market capitalization as of the beginning, mid and end of the year to smoothen possible daily fluctuations.

7.9 The results of this peer group analysis are shown in the tables below. As input data, the TRA used Reuters "standardized" data reported in the local reporting currency harmonized by Reuters so enabling unbiased comparability across companies and industries. "Standardization" is applied to some specific items (e.g. "R&D expenditures") in a company's specific data, harmonizing possible specific accounting treatment of these items.

Table 17: Long Term Observed Gearing - Integrated Peers (Equity Market Values, Debt Book Values)

Company	Ticker Symbol	Avg. Total Debt in %	Avg. Total Equity in %
AT&T	T.N	28.85%	71.15%
Bahrain Telecom	BTEL.BH	5.78%	94.22%
Belgacom	BCOM.BR	18.02%	81.98%
Cable & Wireless PLC	CWC.L	34.01%	65.99%
Deutsche Telekom	DTEGn.DE	47.97%	52.03%
Elisa Oyj	ELI1V.HE	20.82%	79.18%
France Telecom	FTE.PA	44.24%	55.76%
Freenet AG	FNTGn.DE	40.79%	59.21%
Koninklijke KPN NV	KPN.AS	37.62%	62.38%
Oman Telecommunications Co SAOG	OTL.OM	4.70%	95.30%
Pakistan Telecommunication Co Ltd	PTCA.KA	10.80%	89.20%
PCCW	0008.HK	55.27%	44.73%
Portugal Telecom Sgps SA	PTC.LS	44.44%	55.56%
Qatar Telecom	QTEL.QA	45.16%	54.84%
Singtel	STEL.SI	12.49%	87.51%
Swisscom	SCMN.VX	31.24%	68.76%
Telefonica SA	TEF.MC	41.48%	58.52%
Telekom Austria	TELA.VI	37.15%	62.85%
Telekom Malaysia Bhd	TLMM.KL	29.64%	70.36%
Telenet	TNET.BR	51.72%	48.28%
Telenor ASA	TEL.OL	23.94%	76.06%

Telstra	TLS.AX	26.33%	73.67%
Verizon	VZ.N	31.52%	68.48%
Vodafone	VOD.L	28.10%	71.90%
Average		**31.34%**	**68.66%**

Source: TRA Analysis, Reuters

Table 18: Long Term Observed Gearing - Fixed Peers (Equity Market Values, Debt Book Values)

Company	Ticker Symbol	Avg. Total Debt in %	Avg. Total Equity in %
BT_Group	BT.L	42.58%	57.42%
CenturyLink Inc	CTL.N	43.66%	56.34%
City Telecom (HK) Lt	1137.HK	29.72%	70.28%
Iliad	ILD.PA	17.51%	82.49%
Vox Telecom Lt	VOXJ.J	15.93%	84.07%
Average		**29.88%**	**70.12%**

Source: TRA Analysis, Reuters

Table 19: Long Term Observed Gearing- Mobile Peers (Equity Market Values, Debt Book Values)

Company	Ticker Symbol	Avg. Total Debt in %	Avg. Total Equity in %
Emirates Integr. Telecommunications Co PJSC (DU)	DU.DU	12.69%	87.31%
Etihad_Etisalat_Co_Nobile_SA	EEC:AB	21.98%	78.02%
Hutchison Telecommunications (Australia) Ltd	HTA:AU	62.30%	37.70%
LG Uplus	032640:KS	29.64%	70.36%
Orascom Telecom Holding SAE	ORTE.CA	34.84%	65.16%
Taiwan_Mobile_Co_Ltd	3045:TT	8.90%	91.10%
Sprint Nextel Corp	S:US	47.43%	52.57%
Average		**31.11%**	**68.89%**

Source: TRA Analysis, Reuters

7.10 The gearing peer analysis shows that the averages for each of the identified segments differ only slightly from each other and that they are in the range of between 29.88% and 31.34%, as shown in the following table.

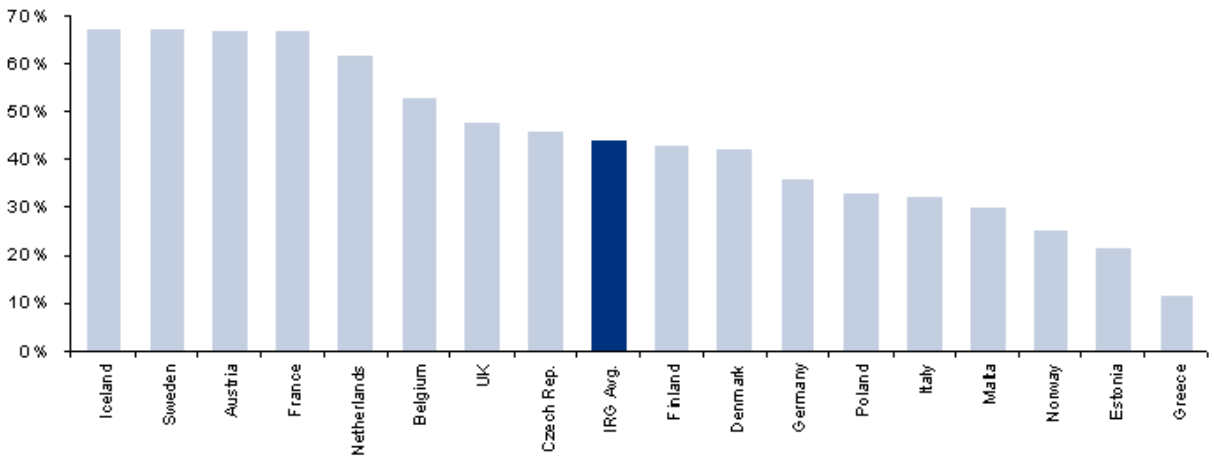
Table 20: Gearing Peers Analysis- Overview

Peers	Avg. Total Debt in %	Avg. Total Term Equity in %
Integrated	31.34%	68.66%
Fixed	29.88%	70.12%
Mobile	31.11%	68.89%
Total Average	**30.78%**	**69.22%**

Source: TRA Analysis

7.11 To verify the results of our selected peer group and to check for possible biases or sensitivities due to the small size of the sample, the TRA also cross-checked the results against gearing levels that have been used by regulators in a range of other countries. These are shown in figure 15.

Figure 15: Regulatory Gearing Analysis



Source: ERG Report "Regulatory Accounting in Practice 2008" - ERG (08) 47 final RA in Practice 081016

7.12 The gearing ratios that have been adopted by regulators in other countries are broadly in line with the results of the TRA's peer group analysis. Due to the lack of visibility of factors such as the inputs, methodologies and selection criteria applied by the IRG, the IRG figures are used for cross-checking purposes only. Nevertheless, the IRG study validates the TRA's view that the optimal gearing level appears to be significantly higher than Etisalat's actual gearing ratio, as demonstrated below.

Etisalat's observed gearing ratio

7.13 In order to compare Etisalat's capital structure with the results of the peer group analysis, the TRA calculated Etisalat's long-term debt ratio under the same set of assumptions with regards to time frame, inputs and methodology. The results for Etisalat's observed debt ratio are shown in the following table. For the purpose of enabling comparison, "actual" gearing, based on 2010 information has also been calculated.

Table 21: Etisalat Observed Gearing

Input parameter (loc. currency in mio.)		2010	2009	2008	2007	2006
D - Total Term Debt (Book Value)		**6,571.81**	**4,625.87**	**3,366.73**	**5,126.88**	**8,518.03**
E - Equity (Market Cap.)		**82,080.11**	**70,045.21**	**97,199.60**	**95,340.44**	**86,015.88**
Equity (Market Cap.)	1. January	79,420.77	59,056.47	116,046.56	77,137.50	103,092.00
	30. June	81,828.55	71,658.38	116,495.78	92,837.25	77,818.13
	31. December	84,991.01	79,420.77	59,056.47	116,046.56	77,137.50
	Average	82,080.11	70,045.21	97,199.60	95,340.44	86,015.88
(D+E) Enterprise Value		**88,651.92**	**74,671.08**	**100,566.33**	**100,467.32**	**94,533.91**
D/(D+E) Gearing Ratio (observed 5-years average equity market value, debt book value)		**6.21%**				
Gearing ratio (actual - year 2010 only)		**7.41%**				

Source: TRA Analysis, Reuters

7.14 Etisalat's observed gearing of 6.21%, calculated in the same manner as the peers' gearing levels, is significantly lower than the range indicated by the peer analysis. Etisalat's "actual" gearing for 2010 is slightly higher at 7.41%.

7.15 Regional differences may be one reason for Etisalat's low observed gearing ratio. This is supported by the fact that many of the Gulf operators (Oman Tel. Co Ltd, Bahrain Tel. Co BSC, Etisalat) also show significantly lower gearing ratios than operators in Europe and other developed countries. One exception to this is Qatar Telecom which shows a very high gearing.

7.16 In order to sanity check the accuracy of the TRA's calculation of Etisalat's capital structure, the TRA compared its results with other sources such as Bloomberg. This exercise provided further validation to the TRA's analysis. Bloomberg provides a capital structure of 93.15% equity and 6.85% debt for Etisalat.[21] The difference between these results and the TRA's results can be explained by time frame dependence and methodological differences (e.g. Bloomberg's calculation is based on actual market values).

7.17 The peer group analysis reveals that Etisalat's gearing level is the third lowest of the peer group and that it differs significantly from the range derived from the peer group assumed to be optimal.

7.18 According to IRG/ERG guidance, the method for determining the optimal/ efficient gearing level should be left to the discretion of the regulator. As information about incremental changes to Etisalat's cost of debt and equity resulting from the changing gearing level is not available, the TRA looked at peers (a sample of first class international operators) as a proxy to determine the optimal gearing level.

7.19 It should be noted as well that one of the main advantages of debt streams from its tax shield, which is more advantageous when the tax rate is high as interest from debt is usually treated as income tax deductible cost. In Etisalat's case a federal royalty fee of 50% is used as an input for the calculation. Assuming the royalty fee is treated like a tax, Etisalat's "marginal tax rate" is one of the highest in the peer group as well as internationally. Thus, due to the strong tax-shield effect, a higher debt ratio for Etisalat would lower the weighted cost of capital significantly.

[21] Bloomberg: Emirates Telecommunications Corp (Etisalat) – Capital structure (July 2011).

7.20 Therefore, it can be concluded from a regulatory perspective that Etisalat has a long-term suboptimal capital structure and could theoretically lower its cost of capital by increasing debt. Based on our peer group analysis and considering Etisalat's company specific characteristics, the TRA considers the optimal debt ratio to be in the range of between 30% and 33%. In order to enable a single point estimate of the WACC to be derived, the TRA proposes to use a gearing ratio of 31.34% which is the average of the integrated peers' gearing levels.

Conclusion

7.21 Based on peer group analysis and considering Etisalat's company specific characteristics, the TRA used a long-term optimal gearing level of 31.34% as a single point of estimate. This figure is the average gearing level of the integrated operator peer group. This value is valid for both for fixed and mobile WACC calculations, as the capital structure of Etisalat could not be appropriately split to only fixed and only mobile long-term investment financing. This conclusion is in line with guidance of ERG/IRG on the most frequently applied methods by NRAs.

7.22 The peer group analysis reveals that Etisalat's observed capital structure of 6.21% is the third lowest of the integrated operators peer group and significantly differs from the peer group average that is assumed to be optimal. Etisalat therefore appears to have suboptimal capital structure from regulatory driven calculation point of view and could theoretically lower its cost of capital by increasing its debt proportion. The WACC calculations in the final chapter indicate how WACC results differ when the gearing ratio is changed.

8. Corporate Income Tax Rate

8.1 The income tax rate is used in WACC calculations to derive the cost of debt by quantifying the value of the associated tax shield.

8.2 The income tax rate is also necessary to enable the calculation of the pre-tax WACC and the post-tax WACC.

TRA approach

8.3 Etisalat is not subject to corporate income tax rate in UAE, but is currently required to pay a federal royalty fee amounting to 50% of its net profits. This 50% rate was applied in the last WACC determination in 2009. The TRA believes that a level of 50% is a valid estimate for the determination period of this WACC because:

- The UAE Federal Authority (Ministry of Finance) is the decision-maker in the case of changes in the royalty rate (and not the TRA); and
- The TRA has no evidence that the rate applicable to Etisalat is likely to be changed (decreased) within the expected time horizon of the WACC.

Conclusion

8.4 The royalty rate applicable to Etisalat of 50% of net profits has been applied in the WACC calculations as a proxy for the corporate income tax rate.

9. WACC Calculation

TRA approach

9.1 The post-tax WACC is defined as:

$$WACC_{post-tax} = r_E * \frac{E}{(E+D)} + r_D * (1-T) * \frac{D}{(E+D)}$$

Where:

r_E – Return on equity, i.e. rate of return expected by shareholders

r_D – Cost of debt, i.e. rate of return requested by creditors

E – Value of equity used by company

D – Value of debt used by company

T– Corporate income tax rate

9.2 The pre-tax WACC is derived from the post-tax WACC using the following formula:

$$WACC_{pre-tax} = \frac{WACC_{post-tax}}{1-T}$$

9.3 The results for both observed and optimal gearing are summarised in the tables below.

ANNEXURE to Determination No. (2) of 2012 - Etisalat's Regulated Weighted Average Cost of Capital, issued 1st of July 2012

Table 22: WACC for Fixed Network, Observed Gearing

TRA analysis (2011): **TRA previous analysis:**

WACC for Fixed observed gearing:	Range:		Recommended	TRA (2009)	TRA (2009)	TRA (2009) Recommend.
Inputs:	**Low:**	**High:**		**Low:**	**High:**	
Risk free rate	2.99%	3.19%	3.07%	4.30%	6.30%	
Debt risk premium	0.99%	0.99%	0.99%	0.65%	0.65%	
Equity risk premium	5.00%	6.00%	5.75%	4.52%	6.49%	
Asset beta	0.51	0.94	0.73			
Weight of debt (Fin. gearing)	6.21%	6.21%	6.21%	3.72%	10.57%	
Weight of equity (Fin. gearing)	93.79%	93.79%	93.79%	96.28%	89.43%	
Income tax rate	50%	50%	50%	50.00%	50.00%	
Calculations:						
Equity beta	0.52	0.98	0.75	0.51	0.54	
Cost of debt pre-tax	3.98%	4.18%	4.06%	4.95%	6.95%	
Cost of debt post-tax	1.99%	2.09%	2.03%	2.48%	3.48%	
Weight of debt	6.21%	6.21%	6.21%	3.72%	10.57%	
Cost of equity	5.61%	9.05%	7.38%	6.61%	9.80%	
Weight of equity	93.79%	93.79%	93.79%	96.28%	89.43%	
Outputs:						
post-tax WACC	**5.39%**	**8.61%**	**7.05%**	**6.45%**	**9.14%**	
pre-tax WACC	**10.78%**	**17.23%**	**14.10%**	**12.90%**	**18.27%**	**15.61%**

Source: TRA Analysis

Table 23: WACC for Fixed Network, Optimal Gearing

TRA analysis (2011):				**TRA previous analysis:**		
WACC for Fixed optimal gearing:	**Range:**		**Recommended**	**TRA (2009)**	**TRA (2009)**	**TRA (2009) Recommend.**
Inputs:	**Low:**	**High:**		**Low:**	**High:**	
Risk free rate	2.99%	3.19%	3.07%	4.30%	6.30%	
Debt risk premium	1.12%	1.12%	1.12%	0.65%	0.65%	
Equity risk premium	5.00%	6.00%	5.75%	4.52%	6.49%	
Asset beta	0.51	0.94	0.73			
Weight of debt (Fin. gearing)	30.00%	33.00%	31.34%	3.72%	10.57%	
Weight of equity (Fin. gearing)	70.00%	67.00%	68.66%	96.28%	89.43%	
Income tax rate	50.00%	50.00%	50.00%	50.00%	50.00%	
Calculations:						
Equity beta	0.62	1.18	0.89	0.51	0.54	
Cost of debt pre-tax	4.11%	4.31%	4.19%	4.95%	6.95%	
Cost of debt post-tax	2.06%	2.16%	2.10%	2.48%	3.48%	
Weight of debt	30.00%	33.00%	31.34%	3.72%	10.57%	
Cost of equity	6.07%	10.25%	8.20%	6.61%	9.80%	
Weight of equity	70.00%	67.00%	68.66%	96%	89%	
Outputs:						
post-tax WACC	**4.87%**	**7.58%**	**6.29%**	**6.45%**	**9.14%**	
pre-tax WACC	**9.74%**	**15.16%**	**12.57%**	**12.90%**	**18.27%**	**15.61%**

Source: TRA Analysis

Table 24: WACC for Mobile Network, Observed Gearing

TRA analysis (2011):				**TRA previous analysis:**		
WACC for Mobile observed gearing:	**Range:**		**Recommended**	**TRA (2009)**	**TRA (2009)**	**TRA (2009) Recommend.**
Inputs:	**Low:**	**High:**		**Low:**	**High:**	
Risk free rate	2.99%	3.19%	3.07%	4.30%	6.30%	
Debt risk premium	0.99%	0.99%	0.99%	0.65%	0.65%	
Equity risk premium	5.00%	6.00%	5.75%	4.52%	6.49%	
Asset beta	0.60	0.94	0.77			
Weight of debt (Fin. gearing)	6.21%	6.21%	6.21%	3.72%	10.57%	
Weight of equity (Fin. gearing)	93.79%	93.79%	93.79%	96.28%	89.43%	
Income tax rate	50.00%	50.00%	50%	50.00%	50.00%	
Calculations:						
Equity beta	0.62	0.98	0.80	0.51	0.54	
Cost of debt pre-tax	3.98%	4.18%	4.06%	4.95%	6.95%	
Cost of debt post-tax	1.99%	2.09%	2.03%	2.48%	3.48%	
Weight of debt	6.21%	6.21%	6.21%	3.72%	10.57%	
Cost of equity	6.11%	9.05%	7.67%	6.61%	9.80%	
Weight of equity	93.79%	93.79%	93.79%	96.28%	89.43%	
Outputs:						
post-tax WACC	**5.86%**	**8.61%**	**7.32%**	**6.45%**	**9.14%**	
pre-tax WACC	**11.71%**	**17.23%**	**14.64%**	**12.90%**	**18.27%**	**15.61%**

Source: TRA Analysis

ANNEXURE to Determination No. (2) of 2012 - Etisalat's Regulated Weighted Average Cost of Capital, issued 1st of July 2012

Table 25: WACC for Mobile Network, Optimal Gearing

	TRA analysis (2011):			TRA previous analysis:		
WACC for Mobile optimal gearing:	**Range:**		**Recommended**	**TRA (2009)**	**TRA (2009)**	**TRA (2009) Recommend.**
Inputs:	**Low:**	**High:**		**Low:**	**High:**	
Risk free rate	2.99%	3.19%	3.07%	4.30%	6.30%	
Debt risk premium	1.12%	1.12%	1.12%	0.65%	0.65%	
Equity risk premium	5.00%	6.00%	5.75%	4.52%	6.49%	
Asset beta	0.60	0.94	0.77			
Weight of debt (Fin. gearing)	30.00%	33.00%	31.34%	3.72%	10.57%	
Weight of equity (Fin. gearing)	70.00%	67.00%	68.66%	96.28%	89.43%	
Income tax rate	50.00%	50.00%	50.00%	50.00%	50.00%	
Calculations:						
Equity beta	0.73	1.18	0.95	0.51	0.54	
Cost of debt pre-tax	4.11%	4.31%	4.19%	4.95%	6.95%	
Cost of debt post-tax	2.06%	2.16%	2.10%	2.48%	3.48%	
Weight of debt	30.00%	33.00%	31.34%	3.72%	10.57%	
Cost of equity	6.66%	10.25%	8.54%	6.61%	9.80%	
Weight of equity	70.00%	67.00%	68.66%	96%	89%	
Outputs:						
post-tax WACC	**5.28%**	**7.58%**	**6.52%**	**6.45%**	**9.14%**	
pre-tax WACC	**10.56%**	**15.16%**	**13.04%**	**12.90%**	**18.27%**	**15.61%**

Source: TRA Analysis

Conclusion

9.4 After a comprehensive analysis of all input parameters, the TRA has derived the following WACC ranges:

- For Etisalat's fixed network, a pre-royalty (pre-tax) WACC range of 10.78% to 17.23% for observed current gearing, and a range of 9.74% to 15.16% for the optimal gearing level.
- For Etisalat's mobile network, a pre-royalty (pre-tax) WACC range amounting to 11.71% to 17.23% for the observed current gearing, and a range of 10.56% to 15.16% for the optimal gearing level.

9.5 Based on the ranges above, the TRA used the following figures as single point estimates of the WACC:

- For Etisalat's fixed network, a pre-royalty (pre-tax) WACC based on optimal gearing levels amounting to 12.57%.
- For Etisalat's mobile network, a pre-royalty (pre-tax) WACC based on optimal gearing levels amounting to 13.04%.

10. Annex- Methodological Approaches

1. Risk Free Rate

Methodological Approach

The risk free rate (Rf) is the expected return on a theoretical financial asset that bears no risk at all. In real life no such asset exists. The risk free rate is used as input for an appropriate pre-tax cost of debt which is calculated as follows:

Rd = Rf + DRP

Where:

Risk free rate (Rf)

Debt risk premium (DRP)

For the calculation government bonds could be used as a proxy for such a risk free investment opportunity. For this approximation to hold true, the following main conditions must be met:

- The bonds are ranked as the highest investment grade by a reputable rating agency (indication of close to zero default risk);
- The bonds are freely traded in sufficient volumes at immaterial transaction costs (indication of zero liquidity risk); and
- The yield to maturity (YTM) of these freely traded investment grade bonds is generally seen as the best proxy for risk free rate.

There are several aspects that need to be taken into account when deriving the risk free rate and identifying appropriate proxies:

a) Maturity:

A bond with shorter maturity or a bond that is reaching maturity normally shows higher YTM volatility than a long-term bond some way off reaching maturity.

In general, long or at least mid-term bonds are more suitable for a WACC calculation, as the WACC is related to the capital structure of a company – which is a long term matter.

Specifically for regulatory purposes, an ex ante WACC calculation requires that the estimates of all variables are forward looking, assuming that current expectations of future developments are already embedded in actual figures. Furthermore, the maturity assumptions for risk free assets should be consistent with assumptions applied for the derivation of the DRP and equity (market) risk premium.

Specifically for fixed and mobile network costing, several aspects need to be taken into account when defining the maturity of instruments for risk free rate derivation:

- Investment horizon: maturity assumptions should be consistent with the investment horizon of investors within the industry. Based on our experience, strategic telecommunication investors usually assume an investment horizon of at least 10 years;

- Asset life cycle: the average technological lifetime of mobile access networks is usually at least 5 years, for fixed access networks 10 years;

- Time horizon for regulatory cost–based pricing reviews: the timeframe used for the cost of capital should be consistent with the cash flows to which it is applied; and

- Different maturity levels of benchmark bonds are used by European regulators for the calculation of the risk-free rate. As shown in the chart below, the 10-year maturity bonds are most often adopted, in 72% of all cases, for the determination of the risk free rate.

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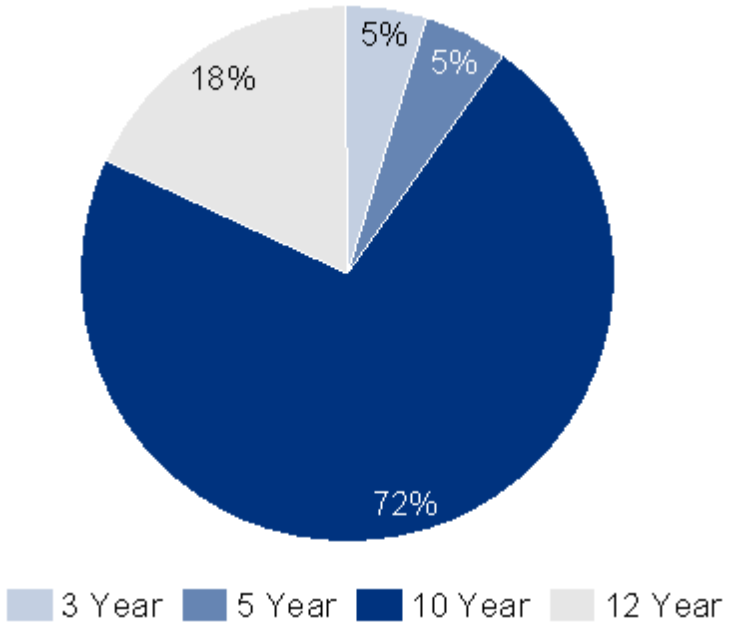
Figure 16: Maturity of Risk Free Rate in EU



Source: ERG Report "Regulatory Accounting in Practice 2008" - ERG (08) 47 final RA in Practice 081016

b) Currency:

Ideally, the financial asset used for the risk free rate derivation should be denominated in the same currency as the cash flow generated by the long-term assets or the investment for which the cost of capital is being calculated. In real life, this theoretical condition can often not be upheld, as the denominations of state bonds are usually set in line with large institutional investors (i.e. bonds buyers/ holders) who prefer USD or EUR.

Usage of current or historical values

When deriving the forward-looking WACC for regulatory purposes, the current values of the risk free rate (YTM of government bond) are considered to be the most appropriate, assuming that best available information on future yield is already reflected in current yields.

In practice however, capital markets have proved not to be perfectly efficient and the rates observed on a particular date may be temporarily distorted by seasonal variations and market anomalies.

The use of moving averages to 'smoothen' these daily values is thus a frequently applied and accepted method to deal with these short-term fluctuations.

2. Cost of Debt

Methodological Approach

There are several general approaches used:

- Direct derivation from YTM of long-term traded bonds issued by the company for which the WACC is being calculated, indicating the return required by bond buyers or holders.

- Derivation of cost of debt using the DRP, which is the compensation investors require over and above the risk free rate for bearing the higher default risk. The spread can usually be determined using rating spread tables from leading rating agencies.

- Rough calculation of cost of debt by referring to the company's existing interest payments for its existing debt.

For regulatory purposes, the IRG (Principles of Implementation and Best Practice for WACC Calculation - February 2007) recommends that for the selection of the relevant approach, the quality and relevance of the information available needs to be considered in order to obtain an estimate as appropriate as possible. IRG refers to the situation, where firms over borrow or borrow at too high rate and therefore the level of debt and associated interest cost are adjusted back to an efficient level by the regulator so that the firm is not rewarded for this financial inefficiency. In such situations IRG recommends the derivation of the efficient cost of debt via the debt risk premium.

Direct derivation of the cost of debt from YTM of issued corporate bonds/ bonds with the same rating

The cost of debt is defined as the rate of return required by creditors and a proxy can be derived from the YTM of existing company long-term bonds or of other bonds with the same ratings, in case that there are no appropriate existing company long-term bonds.

When selecting bonds for cost of debt derivation, the challenges and principles are basically the same as those outlined in the chapter on the risk free rate. Here is a short recapitulation of these aspects:

- Liquidity of bonds and the reliability of their market values: ideally, bonds selected for this calculation should be freely traded fixed income instruments which are available in appropriate volume.

- Maturity of bonds: the maturity should be the same or (preferably) longer than the investors' investment horizons and the lifetime of technical telecommunication assets.

- Currency denomination: should be in line with the denomination of cash flows generated by the telecommunication assets. Just as for government bonds, this condition can often only be met in theory as in real life investors prefer denomination in USD or EUR. Therefore companies that are seeking financing (bond issuers) follow this imperative to ensure the success of their bond emissions.

Although using YTM is a viable approach, YTM values can be distorted by specific market condition, issuer specifics, issue embedded options (call rights or equities call options embedded for convertible bonds) and market specifics. Despite the fact, YTM has been proven to be strongly correlated with the respective bond rating, market conditions can heavily influence the financial parameters of a bond.

Usage of current or historical values

For the derivation of a forward-looking WACC for regulatory purposes, current values of the YTM of corporate bonds are believed to be the most appropriate, assuming that all available information on future yields is already embedded in current yields.

Due to the fact that capital markets are not perfectly efficient and therefore observed rates at a particular date may be temporarily influenced, it is necessary to weaken these distortions using "smoothing". This is commonly achieved by averaging the daily values.

Derivation of cost of debt using debt risk premium

The cost of debt (Rd) can be broken down as follows:
r_D = Rf + DRP

Where:

- Risk free rate (Rf)
- Debt risk premium (DRP)

Since Chapter on the risk free rate has dealt with all aspects of the risk free rate the TRA will only outline additional aspects here. There are basically two approaches to estimating the DRP:

- The company credit rating benchmark approach
- The regulatory benchmark approach

Company credit rating benchmark approach

A company's credit rating is used to identify its credit worthiness based on the evaluation of its potential ability to repay its debt. Each of the rating companies has their own rating classification, but in general all of them rank companies from safest (investment grade) to companies without the ability to repay their debts (default grade). For companies providing long-term financing such as banks and bond buyers, this rating is one of the key indicators to assess the required default spread (as a premium on top of the risk free rate) for the provision of funding. Generally speaking, the higher the credit rating, the lower the spread.

In addition to the ranking class there are several other factors influencing the spread, some are general and others are specific to the rating agency, so it is possible that one and the same company may have different ratings.

Table 26 summarizes up-to-date relations between bond ratings (by trusted ranking agencies Moody's/ Fitch and S&P) and the corporate bond default spread requested for different maturities.

This Reuters database summarized empirical data of industry specific bonds (utilities incl. telecommunications) and represents relevant trustful resource of spreads (in bps over US Treasury yield as proxy for risk free rate) for each rating class. The database is regularly updated as well.

Table 26: Reuters Spreads Utilities (28/7/2011)

Rating	1 yr	2 yr	3 yr	5 yr	7 yr	10 yr	30 yr
Aaa/AAA	22	29	31	36	38	45	48
Aa1/AA+	31	37	41	46	78	83	88
Aa2/AA	36	41	46	56	86	88	93
Aa3/AA-	37	49	62	67	94	99	104
A1/A+	41	50	65	86	102	112	123
A2/A	46	56	71	96	113	118	125
A3/A-	56	66	91	106	123	128	138
Baa1/BBB+	86	91	106	131	128	133	168
Baa2/BBB	106	111	131	151	158	163	188
Baa3/BBB-	108	126	136	156	168	173	203
Ba1/BB+	125	145	155	175	185	205	240
Ba2/BB	145	170	185	215	225	255	295
Ba3/BB-	155	180	190	220	255	375	395
B1/B+	190	195	215	295	310	405	465
B2/B	195	225	320	395	445	535	665
B3/B-	215	370	495	595	645	700	785
Caa/CCC+	390	495	600	660	670	785	885
US Treasury Yield	0,21	0,42	0,68	1,52	2,26	2,98	4,26

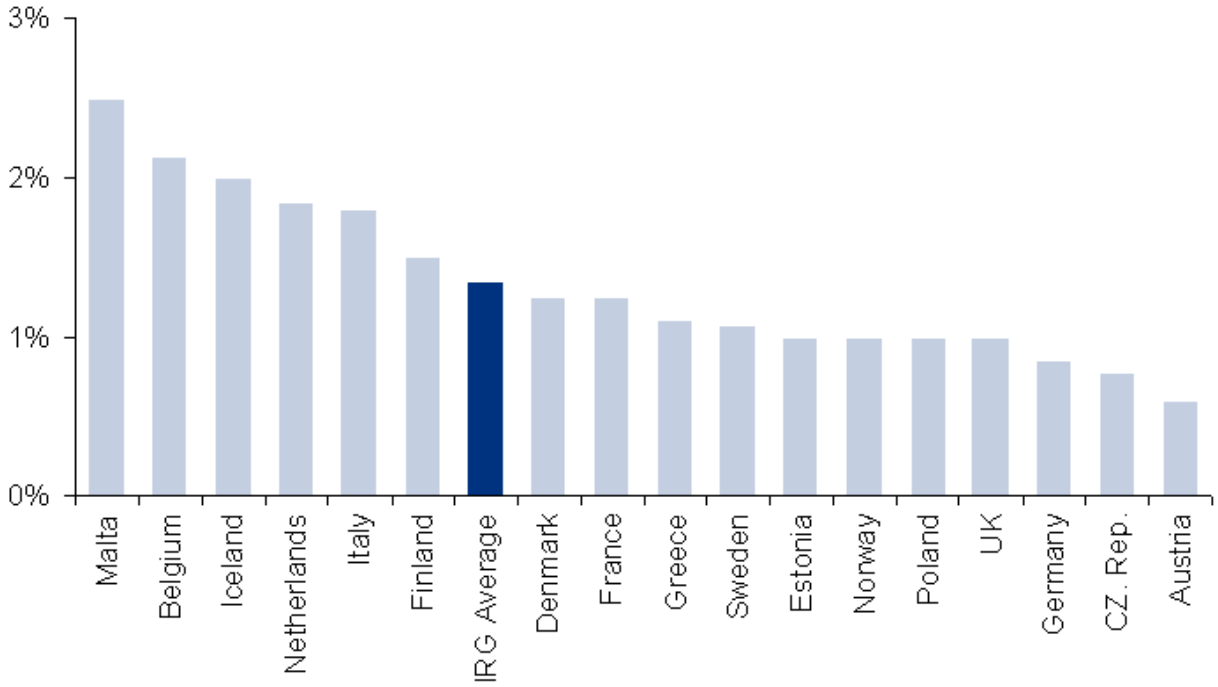
Source: Reuters / Thompson (via Bondsonline)

A potential alternative to the approach described above is to select particular companies with similar characteristics (industry, size, rating, gearing, financial performance) that have issued corporate bonds with corresponding characteristics (maturity, time to maturity, currency denomination, market of issue, face value, coupon rate etc.) and to use the bond spread of these companies as a proxy. However straightforward this approach appears, in practice it is complicated to find bonds that share the required characteristics of the quality needed. As a result the approach based on a broader sample collected from empirical data (as outlined above) is more frequently used.

Regulatory benchmarking approach

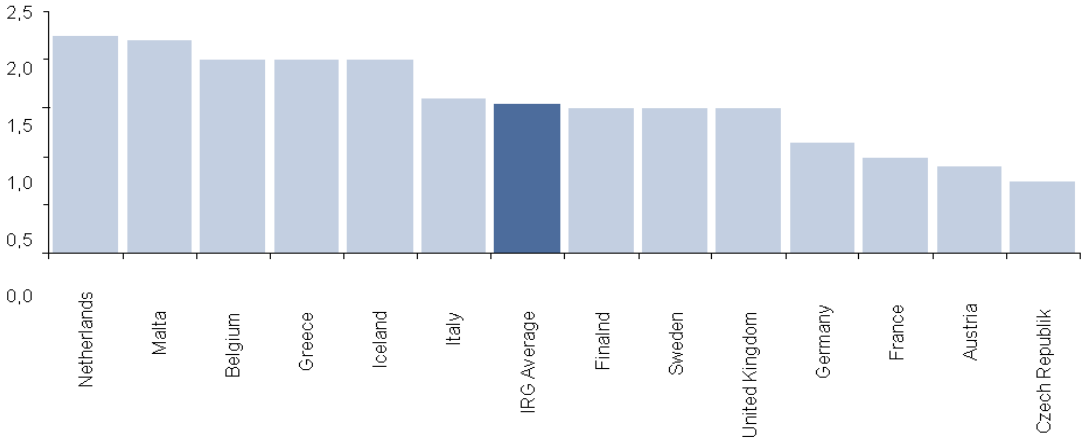
The regulatory benchmarking method can be used as sanity check of the estimate of the DRP of an average telecommunication operator. The Independent Regulators Group (IRG) has provided benchmarks for the DRP of fixed and mobile operators in different countries as illustrated below. IRG refers to country and operator specific issues (eg. differences in calculation period and methodologies) to be taken into account. Unfortunately, information about gearing levels of each operator is not provided.

Figure 17: Debt Risk Premium (Fixed Networks)



Source: ERG Report "Regulatory Accounting in Practice 2008" - ERG (08) 47 final RA in Practice 081016

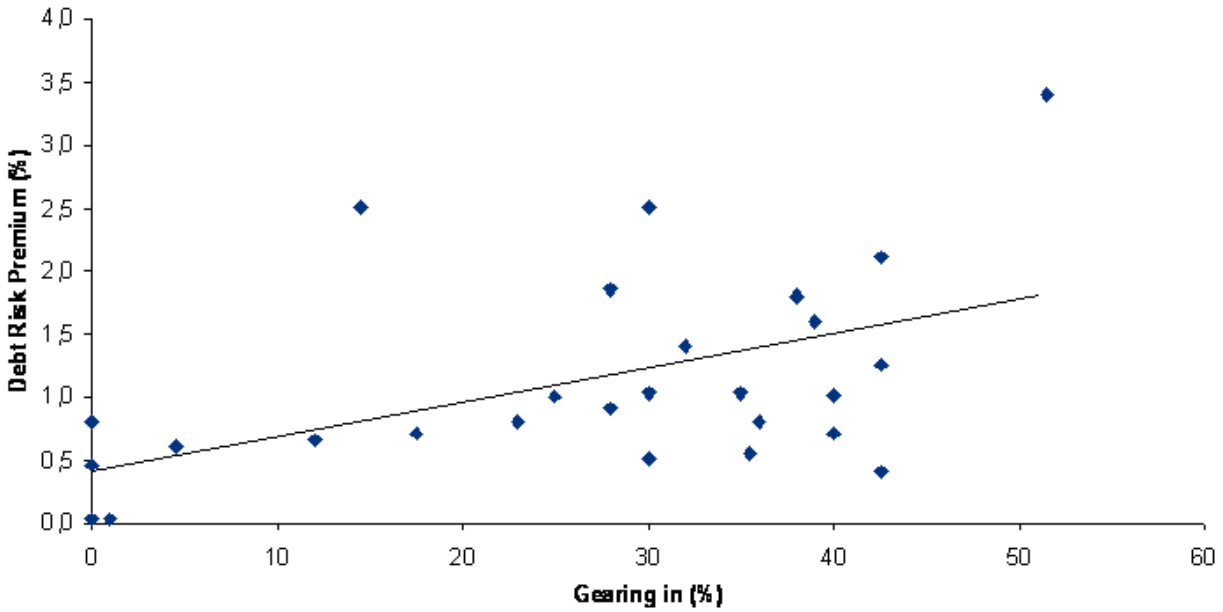
Figure18: Debt Risk Premium (Mobile Networks)



Source: ERG Report "Regulatory Accounting in Practice 2008" - ERG (08) 47 final RA in Practice 081016

The IRG benchmarking sample gives figures ranging from 0.75% to 2.5% with an average of 1.35% for the DRP of a fixed operator and from 0.75% to 2.25% with an average of 1.58% for the DRP of a mobile operator. The relevant DRP for a particular company is also dependent on the company's gearing ratio as depicted in Figure 18, provided by IRG as well, where 0.75% spread corresponds with gearing of up to 20%. For operators with gearing levels in the range of 30-50%, indicative spreads by IRG are in the range of 1%-2.5%.

Figure 19: Relationship between Gearing Ratio & Debt Risk Premium



Source: ERG Report "Regulatory Accounting in Practice 2008" - ERG (08) 47 final RA in Practice 081016

Bonity scoring methodologies used by financing institutions such as banks and bond holders are based on the allocation of corresponding spreads to each rating grade (class). Thus, if a rating agency downgrades a company's rating due to higher gearing, investors will then require a higher spread, which will in turn result in a higher cost of debt.

Exact incremental quantification of this dynamic change is dependent on sensitive internal data of the institutions involved and is specific to each individual request for funding from a company and each individual assessment of risk by potential providers of funding.

Direct derivation of cost of debt from historical borrowing costs

One of the most common methods used here is the calculation of the book interest rate, derived from total interest expenses for long-term financing divided by the total value of long-term debt.

A general drawback of the method is that it merely reflects past (or, in the best case, current) conditions instead of being a forward-looking approach.

Another issue is that, even for companies that transparently present their financials, it is not always possible to obtain the interest rates that are relevant for long-term debts only.

3. Market Risk Premium

Methodological Approach

Several approaches to estimate MRP (or equity risk premium- ERP) have proven their validity and are constantly used in theory and practice. Terms "MRP" and "ERP" are treated as synonyms in this paper.

Historical approach

In the historical approach, which is often considered to be the standard approach, historical returns are used to estimate MRP.

The difference in annual returns on stocks versus bonds over a long time period reflects the expected risk premium.[22] It is assumed what was actually achieved in the past should, in principle, reflect the additional returns required in the future.[23]

Even though this approach is considered the standard and most widely used, there are several methodological issues.

a) Arithmetic versus geometric mean

The question whether to use arithmetic or geometric means when calculating ex-post MRP is subject to an ongoing debate. Two schools of thought center on the geometric mean and the arithmetic mean:

[22] Damodaran, A. (2010) "Equity Risk Premiums (ERP): Determinants, Estimation and Implications – The 2010 Edition".

[23] Grabowski, R., King, D. "The Handbook of advanced Business Valuation" McGraw-Hill.

- The geometric mean represents the compound annual return over the estimation period; while

- The arithmetic mean measures the simple average of annual returns over that period.

It is generally believed that the geometric mean provides a better estimate of long-term returns, while the arithmetic mean provides a better estimate of the next period's returns.[24] However, the two different ways of averaging result in significantly different MRP estimates.

The choice of an approach should be directly linked to the predictability of returns over longer time horizons and the distribution characteristics of these returns. The averages do not necessarily witness such significant differences as in the above sample, but the arithmetic average will in any case be higher than the geometric average (for a variable return series). In case of highly unpredictable returns, it is commonly believed that the use of the arithmetic average makes the better case.[25]

Since the returns are highly unpredictable the TRA will use arithmetic average, which also is the established international regulatory practice.

b) Relevant indices

Another problem arises out of the need to identify the relevant indices to use. In general a choice between world or domestic indices has to be made, depending on how integrated markets are and how internationally diversified investors are.

A case can be made for both approaches. It is common practice to use a domestic index, which however might be limited by the number of observations and lack of long run time periods. The use of world premiums is common practice as well, allowing for more robust estimations due to more data points.

[24] Grant Thornton: "The real-time equity risk premium".

[25] It should be noted that strong arguments can also be made for the use of geometric averages.

c) Time Period

Stock markets are volatile, with significant variation in year-to-year returns. When using too short time periods, this fact may lead to a situation where single events disproportionally distort the overall results of the "true" premium.[26] Too long time periods on the other hand are always object to criticism since this means attaching equal weights to old and recent observations.

However in practice long term periods are considered most appropriate if one does not assume any unnatural shocks on the markets and therefore expects only mild volatility in the MRP.

Survey approach

In the survey approach investors and managers are asked to assess the risk premium, on average the results provide good estimates of actual and future MRP. The survey approach represents a forward-looking approach. Since the MRP is the average premium demanded by investors, surveying investors about their expectations for the future is another valid approach.

Since estimates about future conditions always carry high degrees of uncertainty, the results of a survey approach can only represent a part of the whole picture and should rather be used to confirm/complement results of other approaches to get a more elaborated picture.[27]

4. Beta

Methodological approach

The Equity Beta (β) of a stock describes the relation of its returns with the returns of the financial market as a whole. The beta is related to systematic risk, i.e. the market risk that cannot be eliminated by an investor via portfolio diversification on the same market.

[26] Dimson, E., Marsh, P., Staunton, M., "Global Evidence on the Equity Risk Premium", London Business School.

[27] IRG - Regulatory Accounting , "Principles of Implementation and Best Practices for WACC calculation".

A positive beta means that the asset's returns generally follow the market's returns, in the sense that both tend to be above their respective averages together, or both tend to be below their respective averages together. A negative beta means that the asset's returns generally move opposite to the market's returns.

The equity beta coefficient is usually derived via regression analysis of historical individual stock returns (equity market value for publicly traded companies) against the relevant stock market returns (measured as stock market index development).

The equity beta calculated based on historical figures is correlated to historical financial gearing levels of the respective company.

When selecting the most relevant data set for the regression analysis, there are specific factors that need to be considered:

- Time period: in general, equity betas fluctuate over a business cycle, thus a sufficient observation time period should cover the entire business cycle period. At least 5 years is considered appropriate; and

- Data frequency: in general, monthly estimates are sensitive to the day of the month on which the observations are made, thus weekly estimates are preferred, using the second day of the week to avoid weekend heteroscedasticity (the fact that usually Friday and Monday returns show greater variance than consecutive weekday returns, i.e. Tuesday to Thursday).

Benchmarking approach based on historical data of peers

Benchmarking approach is based on identification of relevant 'pure' players, i.e. operators active in fixed business only or in mobile business only. In parallel, shares (stocks) of these pure players have to be traded on stock market to analyse development of individual stock returns against equity market. Straightforward application of such an approach may become challenging in real-life, as many of the major publicly traded telecommunication operators are active in more business activities, not in fixed or mobile telecommunication only and thus their betas correspond with the perceived risk of their diversified business activities.

Therefore, some additional approaches could be followed to make sanity checks of the Equity Betas of the fixed or mobile network only.

Target beta

This approach is specifically related to the need of NRA's, to find a proper measure of risk for the regulated activity of the operator. This approach is usually applied in certain specific cases as outlined below:

- Operator specific conditions influencing beta: an operator's beta based on historical data does not correspond with the risk of the regulated activity.
- The pure player betas for the bottom-up divisional approach are not sufficient, due to a relatively homogenous sample of peers, or simply lack of sample size.
- De-composition of data for the bottom-up divisional approach is not sufficient, due to limited or incomplete information reported by the operator (typically only revenues reported for fixed, mobile, other, but neither EBITDA nor cash flow figures).

In these cases, the NRA may prefer the determination of the target asset beta that should represent the risk of the regulated activity. Following this logic the operator should only be compensated for this risk.

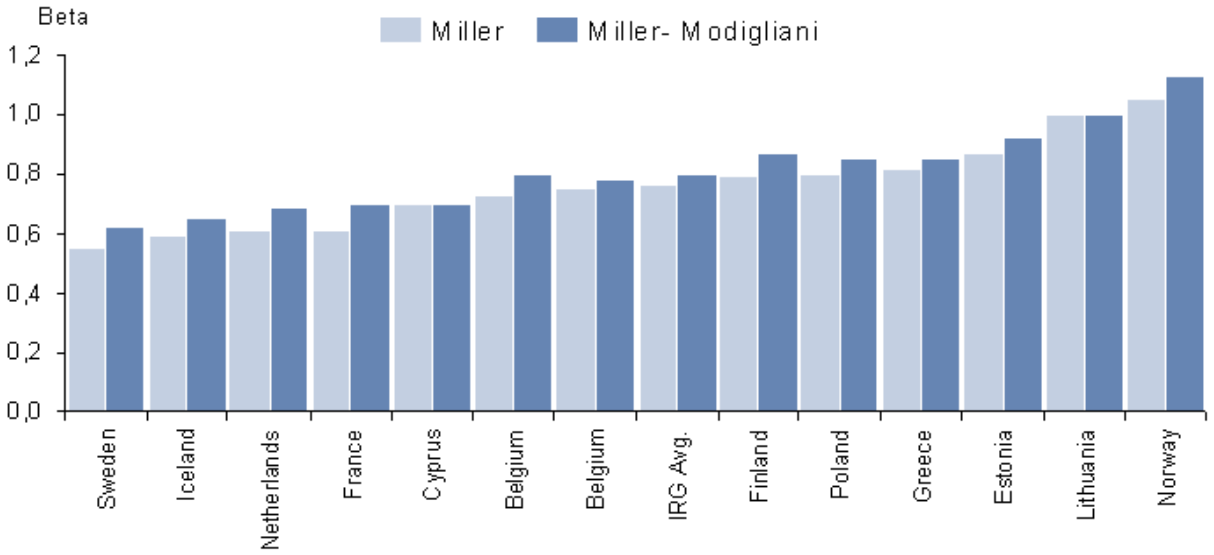
The target beta could be derived via betas of similar operators or companies from industries with similar characteristics (for fixed telecommunication typically utilities companies).

NRA reference cases

The following chart shows the unadjusted asset betas used in the different IRG countries for fixed and mobile networks.

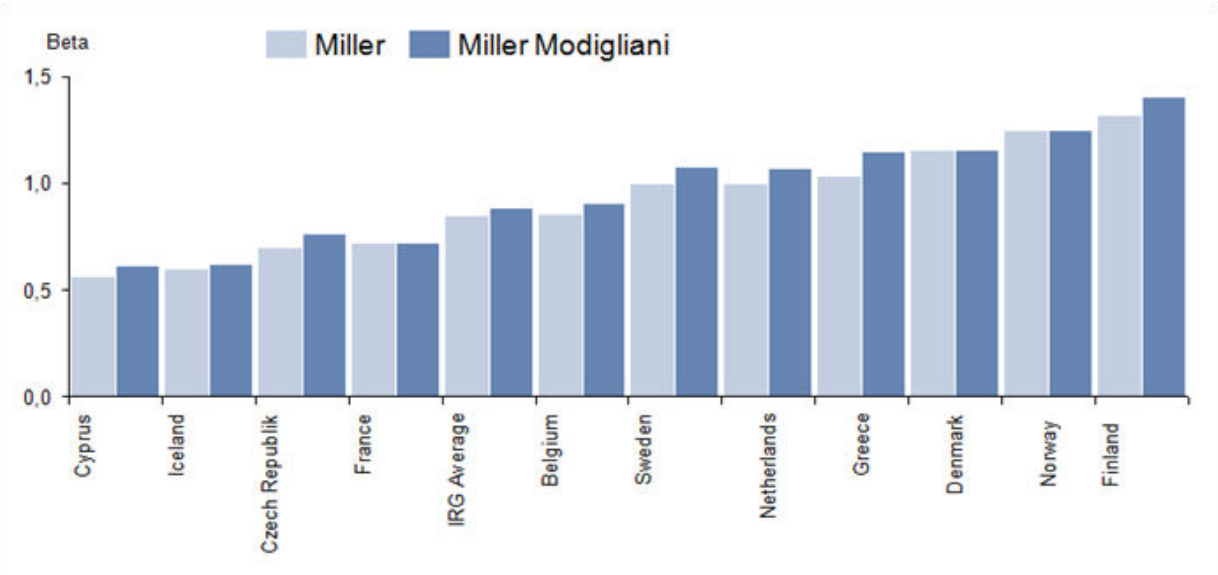
ANNEXURE to Determination No. (2) of 2012 - Etisalat's Regulated Weighted Average Cost of Capital, issued 1st of July 2012

Figure 20: Unadjusted Asset Betas- Fixed Networks
(According to selected IRG countries)



Source: ERG Report "Regulatory Accounting in Practice 2008" - ERG (08) 47 final RA in Practice 081016

Figure 21: Unadjusted Asset Betas- Mobile Networks
(According to selected IRG countries)



Source: ERG Report "Regulatory Accounting in Practice 2008" - ERG (08) 47 final RA in Practice 081016

The most frequently used formula by NRAs to derive asset beta from equity beta is the Miller - Modigliani formula, in some countries the simplified Miller formula (abstracting from income tax effect) is used or the asset beta is not calculated at all.

5. Financial Gearing

Methodological Approach

For the calculation of gearing several approaches exist, with different advantages and shortcomings.

Gearing based on book values

In this approach the gearing is calculated based on accounting values of a company's debt and equity. The advantage is, that accounting figures are usually easily accessible and to a certain degree standardized and therefore increase transparency and audit ability. A significant shortcoming of using book values is that they are not forward-looking but rather give a picture of the company at a certain point in time therefore not reflecting the company's true economic value.

Additionally to that, book values depend on the company's specific accounting policies. They are therefore subject to changes in accounting principles and the company's use of these accounting principles.

Gearing based on market values

As alternative to book values, gearing also can be calculated based on market values of debt and equity. The market value of equity is reflected by its market capitalization which can be derived by multiplying the number of shares with the current market price. The market value of debt however presents a bigger challenge and can often be difficult to obtain.

The market value of the company's bonds can be calculated relatively easily, but usually only represents a portion of the outstanding debt. The value of the non-traded debt is more difficult to obtain. The drawback of using market values is that they are dependent on several market factors such as volatility,

speculation and investors expectations that are not necessarily directly related to the true economic values.

Optimal / efficient gearing

Although often used for regulatory purposes the optimal / efficient gearing presents some challenges. It is important to note that there is a trade-off situation of tax-advantages of debt, effects of higher debt on beta and costs of financial distress. An optimal capital structure therefore has to take several factors such as market risk, tax shield, changes in credit ratings, changes in beta and investment levels into account. From a regulatory perspective it is also important to not implement a regime that rewards for excessive borrowing, but rather set incentives for efficient capital structures.

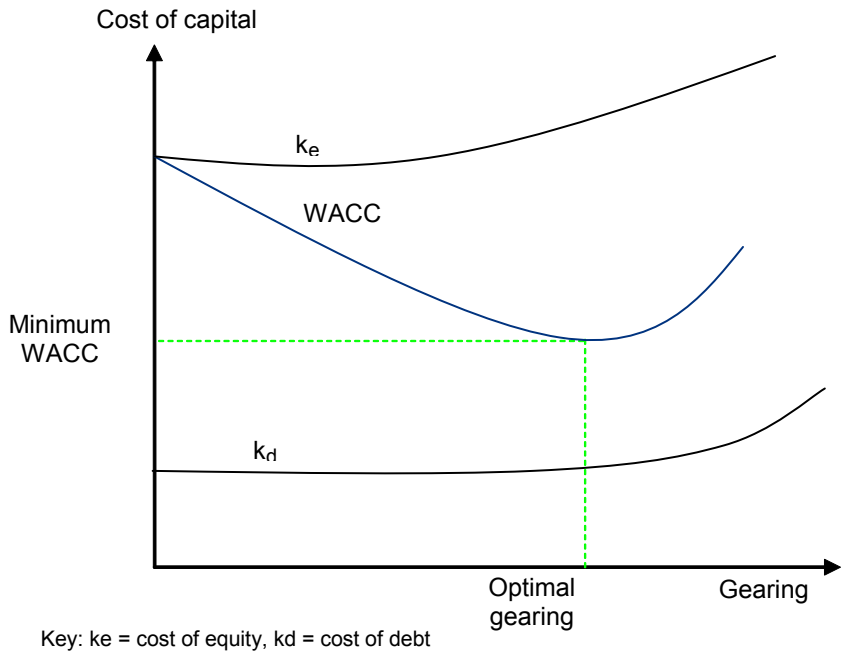
The trade-off

The answer of an optimal capital structure lies in solving the trade-off between tax-advantages of debt, effects of higher debt on beta (which are in more detail part of Beta chapter) and costs of financial distress. More easily spoken when a firm increases its reliance on debt finance, both debt and equity (debt has a priority claim) become more risky, and hence the costs of both debt (financial distress costs, agency costs, and less flexibility) and equity rise, to a certain point the effect of replacing the more expensive equity with the cheaper debt, overcompensates this rise in debt and equity costs.

At a certain point this effect turns into the opposite and adding more debt becomes disadvantageous and total capital cost begin to increase.

The graph below illustrates the relationship:

Figure 22: Optimal Gearing



Key: ke = cost of equity, kd = cost of debt

Source: Ross, Westerfield, Jaffe, "Corporate Finance" (2008)

It is commonly agreed that for practical purposes it is (for an array of reasons) not possible to exactly pinpoint the optimal ratio.

The benefits of using debt lie within its tax benefits (tax shield) and a more theoretical benefit which can be seen as added discipline imposed on the management by the scheduled debt re-payments. The tax advantage of debt stems from the fact that in most countries the interest paid on debt is tax deductible.[28] Modigliani & Miller have shown that in a tax free world the capital structure becomes totally irrelevant.

[28] Damodaran, A., "Applied Corporate Finance" (2010).

The tax benefits of debt can be presented in three ways. For the calculation of the cost of debt in the cost of capital calculation, the tax benefit from debt is usually expressed in terms of the difference between pre-tax and after-tax cost of debt.

After-tax cost of debt: $(k_d) = r(1-t)$

Where:

r = interest rate on debt

t = marginal tax rate

k_d = after tax cost of borrowing

As can be seen the after-tax cost is a decreasing function of the tax rate. The advantage from substituting equity by debt financing / increasing debt ratios is therefore much greater in countries where tax rates are higher. The disciplining effects on the management of a firm will be left outside this analysis. There are however certainly disadvantages / costs of increasing debt as well, which are responsible for the upward slope of the WACC curve once a certain debt level has been reached.

One primary problem with increasing debt levels is the increase in expected bankruptcy costs, as well as agency costs. The probability of bankruptcy increases marginally for all firms as they borrow more money. While this relation seems trivial the quantification of bankruptcy costs and therefore increase in cost of debt is neither obvious nor easy.[29]

Some general implications for optimal capital structures are as follows:

- Firms operating in businesses with volatile earnings and cash should use less debt than similar firms with stable cash flows;

[29] In general the cost of bankruptcy can be divided in direct & indirect costs for further explanation see common white papers about capital structure. For our analysis however we will need to shorten in detail explanation of general concepts.

- If firms can structure their debt in such a way that the cash flows on the debt increase and decrease with their operating cash flows, they can afford higher debt levels;

- If an external entity provides protection against bankruptcy;

- If the assets of a firm are easily divisible and marketable, the direct bankruptcy costs are lower, therefore the firm should borrow more; and

- Firms that have products that require long-term servicing and support should have lower leverage than firms whose products do not share this feature.

Corporate Income Tax

Methodological approach

There are two approaches to incorporate income tax rate as follows.

Nominal tax rate (headline, marginal)

This standard approach applies country specific income tax rate as applicable by relevant country tax laws.

Effective tax rate

This approach takes into account the actual or historical tax payments of the company compared to its profit (tax base) and quantifies thereof "effective" tax rate that is then applied in WACC calculation. Usually the effective tax rate is lower than the nominal tax rate, as especially large companies are active in tax optimization, or some former state owned incumbent are granted special tax related incentives.

The challenge for both methods is to predict the changes in state tax policy for the future and consequences for the company. Usually, if there is no specific evidence, the existing tax rate is applied.

11. Glossary of Terms

LRIC - long-run incremental costs

CCA - current costs accounting

HCA - historical costs accounting

TRA - Telecommunications Regulatory Authority

WACC - Weighted Average Cost of Capital

NRA – National Regulatory Authority

IRG- Independent Regulator s Group

ERG- European Regulator s Group

Rd - cost of debt

Rf – risk free rate

DRP- debt risk premium

MRP- market risk premium

ERP- equity risk premium

YTM- yield to maturity

GDP- gross domestic product

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