



Appendix I

WACC calculations for 2018

The rate of return shall be based on weighted average cost of capital (WACC) which is calculated from the cost of equity and the cost of debts in accordance with Regulation no. 564/2011. The CAPM model shall be used when calculating the cost of equity and the cost shall reflect the time value of money and the risk related to operations on the market in question. The cost of debts shall be calculated as the sum of risk-free rate and risk premium which reflects normal mark-up by companies on the market. The PTA decides at least once a year the WACC for the telecommunication markets based on market premium, economic gearing and the position with respect to working capital and debts.

The WACC depends on how much of a company's assets are funded by debt, on the one hand, and equity, on the other, and the cost of the funds used.

The PTA considers the use of the WACC real model to be most appropriate for calculating the rate of return when deciding annuity on investments in each instance. The PTA considers it to be real costs when the investment base is calculated using indexed historical costs, and that one should therefore use real interest rate in calculations of the WACC. Otherwise, the result would be distorted as inflation is included in the nominal interest rate.

Investments that have been booked at purchased price are indexed with the building index or other indices. Such calculations are part of the assessment of real value of investments in each instance where the aim is to approximate the replacement cost of investments at the time being examined. If investments have been assessed at replacement cost, then they are assessed at prices of the operational year being examined in each instance. Opex is furthermore real costs of the operational year in question, which are used as a reference for costs on an annual basis.

1 The WACC formula

In order to decide the WACC, the following formula is used:

$$WACC = K_e \times \frac{E}{(D + E)} + K_d \times \frac{D}{(D + E)}$$

where:

K_e = cost of equity in percentage

E = equity

K_d = cost of debt in percentage

D = interest-bearing debt



When calculated post-tax:

$$WACC_{post-tax} = K_e \times \frac{E}{(D + E)} + (1 - t) \times K_d \times \frac{D}{(D + E)}$$

where:

$t =$ corporate income tax rate

When WACC is calculated pre-tax:

$$WACC_{pre-tax} = \frac{WACC_{post-tax}}{(1 - t)}$$

2 Cost of equity

The PTA considers that when deciding the WACC, the Capital Asset Pricing Model (CAPM) should be used. The main argument for using CAPM is that this model is easy-to-use and transparent. It is also the most commonly used method for calculating the rate of return on capital which facilitates comparison.

The CAPM model is used for calculating the cost of equity:

$$K_e = R_f + \beta \times (R_m - R_f)$$

where:

$R_f =$ risk-free rate

$R_m =$ expected average return on stock market

$(R_m - R_f) =$ market risk premium

$\beta =$ beta parameter which indicates the risk of the sector in question in comparison with the market as a whole

Here below are the main parameters in the CAPM model and the PTA conclusion on how the Administration decides them.

3 Risk-free rate

The PTA considers it appropriate to set the risk-free interest rate at the rate of return on HFF 1506 2044 30 Housing Financing Fund bonds as these bonds today best reflect the payment flow being converted to current value when one considers the lifetime of the investments in question. These bonds are indexed and therefore include inflation expectations.



There has however been uncertainty in recent years about the future of the Housing Financing Fund and in the opinion of analysts a risk premium has developed on top of the indexed Housing Financing Fund bonds. This indicates that the rate of return on HHS bonds no longer reflects risk-free interest rate on the market. In order to evaluate the risk-free interest rate, the PTA takes into account an adjustment to the amount of estimated "Housing Financing Fund premium" in each instance, cf. following table:

Risk free rate - 12-month average of each year						
	2014	2015	2016	2017	2018	5-year average
HFF 44	3.19%	2.67%	2.78%	2.26%	1.93%	2.57%
HFF - RIKS average premium	0.28%	0.12%	0.14%	0.16%	0.16%	0.17%
Risk free rate	2.92%	2.55%	2.64%	2.10%	1.77%	2.40%

Given the above specified criteria the average risk-free real interest rate for the last 5 years is 2.40%.

4 Beta risk parameter β

In order to estimate the Beta parameter reference was made to comparable companies in European states that are considered best suited for comparison with the Icelandic market environment, both economically and legally (as categorised by Capital IQ). The following table shows the result of this comparison:

Beta and gearing – Telecoms							
Company	Country	Total debt 5 year		D/E	Tax rate	Unlevered Beta	
		Debt	Equity			2 years	5 years
BT Group plc	United Kingdom	38.10%	61.90%	61.50%	19.80%	0.49	0.57
Deutsche Telekom AG	Germany	49.80%	50.20%	99.20%	29.70%	0.49	0.50
Elisa Oyj	Finland	19.20%	80.80%	23.70%	20.00%	0.56	0.55
Koninklijke KPN N.V.	Netherlands	46.10%	53.90%	85.40%	25.00%	0.59	0.41
Orange S.A.	France	52.00%	48.00%	108.50%	33.30%	0.46	0.43
Proximus PLC	Belgium	24.90%	75.10%	33.10%	33.00%	0.57	0.56
Swisscom AG	Switzerland	28.80%	71.20%	40.50%	17.90%	0.62	0.55
Telekom Austria Aktiengesellschaft	Austria	47.30%	52.70%	89.90%	25.00%	0.53	0.45
Telenor ASA	Norway	24.90%	75.10%	33.10%	25.20%	0.59	0.50
Telia Company AB (publ)	Sweden	34.50%	65.50%	52.60%	22.00%	0.53	0.45
Average		0.37	0.63	0.63	0.25	0.54	0.50
Median		0.36	0.64	0.57	0.25	0.55	0.50

Source: Capital IQ



On the basis of the above specified method, the conclusion is derived that unlevered beta for telecom companies is in the range of 0.50-0.55. The PTA has decided to use the value 0.53.

Unlevered beta shall be levered using the appropriate indebtedness and tax rate. Further discussion on indebtedness and tax rate is in the sections with those names. Unlevered beta is levered using the Modigliani-Miller formula which takes into account risk from indebtedness and tax rate, see the formula below:

$$\beta_{assets} = \frac{\beta_{equity}}{(1 + (1 - t) \times \frac{D}{E})}$$

where:

Beta assets (β_{assets}) is equivalent to unlevered beta and where beta equity (β_{equity}) is equivalent to levered beta.

5 Market risk premium

The PTA considers it proper, given development over recent years, that the market risk premium be in the range of 4.5-5.5% without the country specific risk. The PTA uses historical premium of risk-free interest rate. As the premium is considered for the long run, substantial changes over a long period of time would be needed to have an impact on market risk premium. The PTA also takes into account the BEREC benchmark from the preceding years and compares it with what generally applies in this country.

The PTA considers it appropriate to use 5% market risk premium for the year 2018, which is according to the above specified criteria. The Administration reviews the market risk premium annually but has not deemed it necessary to change it in recent years.

6 Specific debt premium

The PTA has proposed the use of real interest rate as stated previously. Real interest rate on debts subsequently bear a specific debt premium which reflects market circumstances in each instance and not the specific debt premium of individual companies. This premium is decided by the PTA.

For comparison, the premium abroad is commonly in the range of 1-2% while in this country it is more common for the premium to be in the range of 2-3%.

The PTA prescribes that the debt premium for the year 2018 should be at the upper limit of the above specified range, i.e. 3.0%. The premium is consistent with the terms companies in this country have enjoyed recently and takes into account circumstances on the market, but it is also taken into account that this is in context of taking of long-term loans. The



Administration reviews the specific debt premium annually but has not deemed it necessary to change it in recent years.

7 Gearing

The PTA considers it normal to use gearing on the telecommunications market by assessing gearing of a reference group of electronic communications companies which are deemed to be run efficiently, and target gearing from PTA sister administrations in Europe. Assessed efficient level of gearing is therefore independent of the indebtedness of the company in question in each instance.

The PTA conclusion is to use an unchanged gearing from the previous year for Mila , i.e. 35%.

8 Tax rate

The PTA considers that the use of corporate tax rate is in each instance the best measure for tax rate when calculating WACC. Its use is more transparent and simpler than using the effective tax rate. The PTA intends to use the corporate tax rate in force for the period of time in question in each instance in these calculations, which was 20% in 2018.

9 PTA conclusion on WACC

When calculating $WACC_{real}$, PTA uses real risk-free rates. Indexed series of bonds are issued in Iceland and they are considered better benchmarks for real interest rates instead of calculating $WACC_{real}$ from inflation forecast.

The $WACC_{real}$ for the operational year 2018 using the above PTA criteria is shown in the table here below. For comparison the WACC calculation for 2017 is also shown.



WACC_{real}	2018	2017
Real risk-free rate	2.40%	2.49%
Unlevered beta	0.53	0.54
Levered beta	0.76	0.77
Debts/equity ratio	0.54	0.54
Market risk premium	5.00%	5.00%
Cost of equity	6.19%	6.35%
Real risk-free rate	2.40%	2.49%
Debt premium	3.00%	3.00%
Cost of debt	5.40%	5.49%
Interest bearing debt %	35%	35%
Equity %	65%	65%
Corporate tax rate	20%	20%
Cost of dept, post-tax	4.32%	4.39%
Cost of equity, pre-tax	7.74%	7.94%
WACC_{real} (pre-tax)	6.9%	7.1%

In accordance with the above it is the opinion of the PTA that weighted average cost of capital (WACC real) for a telecom company in Iceland is 6.9% for the year 2018 in calculations of rate of return for capital tied in assets used in connection with the company's provision of services. Comparing with the WACC for the year 2017 which was 7.1% there is a decrease of 20 points. The decrease stems from the decrease in the value of beta and the risk-free rate.