Office of Utilities Regulation

Estimate of the Weighted Average Cost of Capital for Telecommunications Carriers

Determination Notice

OUR

OFFICE OF UTILITIES REGULATION

2021 September 1

DOCUMENT TITLE AND APPROVAL PAGE

1. DOCUMENT NUMBER: 2021/TEL/010/DET.002

2. DOCUMENT TITLE: Estimate of the Weighted Average Cost of Capital for Telecommunications Carriers – **Determination Notice**

3. PURPOSE OF DOCUMENT

This document contains the main decisions of the Office of Utilities Regulation regarding the estimation of the Weighted Average Cost of Capital (WACC) for fixed and mobile telecommunications carriers providing services in Jamaica.

4. ANTECEDENT PUBLICATIONS

Publication Number	Publication Title	Publication Date
2020/TEL/011/CON.002	Estimate of the Weighted Average Cost of Capital for Telecommunications Carriers – Consultation Document	2020 June 24
2016/TEL/016/DET.002	Estimate of the Weighted Average Cost of Capital for Telecommunications Carriers – Determination Notice	2016 November 15

5. Approval

This document is approved by the Office of Utilities Regulation and the decisions therein become effective on **2021 September 1**.

On behalf of the Office:

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Ansord E. Hewitt
Director-General

2021/09/01

.....

Date

Abstract

This Determination Notice outlines the Office of Utilities Regulation's (OUR's) approach to updating the parameters that are involved in the estimation of the WACCs for fixed and mobile telecommunications carriers. The sources relied on and the methodology followed to extract and calculate the WACC parameters are consistent with that utilised by the OUR in the "Determination Notice – Estimate of the Weighted Average Cost of Capital for Telecommunications Carriers" (Document Number: 2016/TEL/016/DET.002) published 2016 November 15.

This Determination Notice also sets out the OUR's response to comments provided by stakeholders who responded to the Consultation Document dated 2020 June 24 and entitled "Estimate of the Weighted Average Cost of Capital for Telecommunications Carriers – Consultation Document" (Document No: 2020/TEL/011/CON.002). Further, this Determination Notice indicates the Office's decision regarding the estimated WACCs for fixed and mobile telecommunications carriers.

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Abbreviations and Definitions

2016 Determination Notice – Determination Notice – Estimate of the Weighted Average Cost of Capital for Telecommunications Carriers (Document Number: 2016/TEL/016/DET.002) published 2016 November 15

Act – Telecommunications Act

BEREC - Body of European Regulators for Electronic Communications

BIPT - Belgian Institute for Postal Services and Telecommunications

C&WJ – Cable & Wireless Jamaica Limited

CACU – Consumer Advisory Committee on Utilities

CAPM – Capital Asset Pricing Mechanism

Consultation Document - Estimate of the Weighted Average Cost of Capital for Telecommunications Carriers – Consultation Document (Document No: 2020/TEL/011/CON.002) published on 2020 June 24

CRP – Country Risk Premium

D – Debt

Digicel – Digicel Jamaica Limited

E – Equity

ECTEL – Eastern Caribbean Telecommunications Authority

ERP – Equity Risk Premium

Flow – Joint reference to Cable & Wireless Jamaica Limited and Columbus Communications Jamaica Limited

GOJ – Government of Jamaica

IMF – International Monetary Fund

MRP – Market Risk Premium

N/A – Not Available

NRA – National Regulatory Authority

OUR – Office of Utilities Regulation

OURIC – Office of Utilities Regulation Information Centre

PTS - Swedish Post and Telecom Authority

RFR – Risk Free Rate

US/USA – United States of America

USD – United States Dollar

WACC – Weighted Average Cost of Capital

Chapter 1: Introduction

Background

1.1. The cost of capital is the opportunity cost of investing a portfolio of debt and equity in one activity instead of alternative activities. Thus, the cost of capital is the cost of financing a company's activities. It is typically used in regulatory proceedings to estimate the expected return in a well-functioning capital market.

1.2. It is important that an appropriate cost of capital be estimated for the telecommunications sector as it serves as a measure of the return on capital which companies in the sector are allowed to earn. The estimate of the WACC therefore serves as a critical input into any pricing model to be developed or approved by the Office of Utilities Regulation (the "OUR" or the "Office").

1.3. The Consultation Document, "Estimate of the Weighted Average Cost of Capital for Telecommunications Carriers – Consultation Document" (Document No: 2020/TEL/011/CON.002) was published on 2020 June 24 (the "Consultation Document"). Responses to the Consultation Document were requested from industry stakeholders by the deadline of 2020 July 22.

1.4. The OUR received responses to the Consultation Document from i) Cable & Wireless Jamaica Limited ("C&WJ"); ii) Digicel Jamaica Limited ("Digicel"); and iii) Consumer Advisory Committee on Utilities ("CACU").

1.5. Stakeholders were then given until 2020 August 11 to comment on the responses received from other stakeholders. Comments on responses were received from i) C&WJ and ii) Digicel.

1.6. In the documents from C&WJ, the respondent was referred to as C&WJ and Flow interchangeably. Therefore, going forward the feedback from those documents will be referred to as the feedback of the combined C&WJ and Columbus Communications Jamaica Limited, i.e. Flow.

Legislative Framework

1.7. Section 29 of the Telecommunications Act (the Act), states:

> *"29. - (1) Each carrier shall, upon request in accordance with this Part, permit interconnection of its public network with the public network of any other carrier for the provision of telecommunications services. ...*
>
> *(4) The Office may, either on its own initiative in assessing an interconnection agreement, or in resolving a dispute between operators, make a determination of the terms and conditions of call termination, including charges.*
>
> *(5) When making a determination of an operator's call termination charges, the Office shall have regard to the principle of cost orientation, so, however, that if the operator is non-dominant then the Office may also consider reciprocity and other approaches."*

1.8. Further, section 30 of the Act requires that dominant public telecommunications carriers provide interconnection in accordance with various principles. In particular section 30 (1)(a)(iii) requires that charges for interconnection services "*...shall be cost oriented and guided by the principles specified in section 33*".

1.9. Regarding infrastructure sharing, the same principles apply. Section 29A(2) of the Act states that:

> *"(2) All infrastructure sharing arrangements made by the Office shall include the making of rules, after consultation with the Minister, for the apportionment of the costs of sharing infrastructure; and the rules shall be made in accordance with the principles set out in section 33.*

1.10. The abovementioned section 33 outlines, among other things, the principle of cost orientation for interconnection and infrastructure services. More specifically, paragraph d) of this section provides that "*...costs shall include*

attributable operating expenditure and depreciation and an amount estimated to achieve a reasonable rate of return;"

1.11. The OUR considers the weighted average cost of capital (WACC) as the most accurate measure of the reasonable rate of return to meet the objectives of cost orientation defined in the Act.

1.12. Therefore, in accordance with the principles set out in the Act, the WACC will be used by the Office when making a determination on wholesale charges in order to maintain the principle of cost orientation.

Structure of Determination Notice

1.13. The remainder of this Determination Notice is structured in the following manner:

- **Chapter 2** outlines the general framework for estimating the WACC.
- **Chapter 3** discusses the issue of the appropriate gearing for telecommunications networks.
- **Chapter 4** estimates the cost of debt.
- **Chapter 5** estimates the cost of equity.
- **Chapter 6** deals with how to convert the US dollar WACC to a Jamaican dollar equivalent.
- **Chapter 7** presents the estimated WACCs.
- **Annex A** summarises the determinations made in this document.
- **Annex B** and **C** provide the references used throughout the document.

Chapter 2: General Framework for Estimating the Cost of Capital

Introduction

2.1. The present approach followed, to determine the parameters required to estimate the WACC, is in general, consistent with the one approved by the Office in its *"Determination Notice – Estimate of the Weighted Average Cost of Capital for Telecommunications Carriers (Document Number: 2016/TEL/016/DET.002)"* published 2016 November 15 (the 2016 Determination Notice). Approaches based on international best practice have also been utilised to estimate some of the parameters presented in this document. Additionally, as stated in the Consultation Document, the parameters extracted from international sources were subject to updates before the issuance of the Determination Notice.

2.2. Based on the OUR's review of the parameters and taking account of feedback provided by stakeholders, the OUR has updated the following parameters with more recent figures:

- risk-free rate;
- country risk premium;
- market risk premium; and
- inflation.

The reasons for the update of each of these parameters are presented in subsequent sections. All other parameters remain as presented in the Consultation Document.

Timeline for the Update of the WACC

OUR's Proposal

2.3. In the 2016 Determination Notice, the OUR determined that the WACC will be updated every five years from the effective date of the 2016 Determination Notice; that is, 2016 November 28. The OUR, in the

Consultation Document, reiterated its position that the WACC will be updated every five years and further stated that the estimate of the WACC serves as a critical input into any pricing model to be developed or approved by the Office.

Stakeholders' Comments

2.4. Digicel noted that, given that the last WACC determined by the OUR was dated 2016 November 28 and it is valid for 5 years, the WACC is not due to be updated until 2021 November 28. The company opined that shortening the review period without material reason undermines the regulatory certainty of the process. Further, Digicel stated that if the effective date of the new estimate remains at 2021 November 28, the inputs considered in its calculation would be aged at the time of implementation and would degrade the quality of the estimate. In support of its argument, the company noted the economic impact of the on-going COVID-19 pandemic.

2.5. Digicel further expressed the view that the current review is premature and recommended that the Office defer the review until Quarter 1, 2021 at the earliest to allow time for more informed views to emerge in relation to the impacts of the COVID-19 pandemic.

OUR's Response

2.6. The OUR notes Digicel's comments.

2.7. The updating of the WACC in advance of the date indicated in the 2016 Determination Notice is being undertaken to provide increased regulatory certainty to the market. The calculation of the WACC involves the estimation of a number of parameters, such as cost of equity (following the Capital Asset Pricing Model) and the cost of debt, which all require time and effort to collate. In order for the OUR to have a measure of the WACC available in a timely manner, its calculation must occur before the value is required.

This necessitates the commencement of the updating process prior to the five (5) year anniversary.

2.8. Additionally, as the industry is aware, the OUR is currently updating the existing fixed and mobile cost models, and these updated cost models will be implemented in 2021. The WACC is a critical input into those models. The 2016 Determination Notice did indicate that "Ideally, the WACC and cost models should be updated at the same time". In light of the current cost model updates now underway, the ideal condition to effect the simultaneous update of the WACC and the cost models have occurred, albeit a few months in advance of the due date for the updated WACCs. Having a determination on the WACCs before making a determination on the updated cost models is ideal. This allows operators to see what the determined rates will be over the five-year period. While it would be possible to implement the updated models with the current WACCs and then updating these models once the updated WACCs become effective, the OUR is of the view that this would create additional work for the OUR and the regulated companies, with little to no benefit. The updated WACCs will become effective on 2021 November 28. Where the models have been finalized before the updated WACCs become effective, the models will contain two WACCs values; the current WACC for the period before 2021 November 28 and the updated WACC thereafter.

2.9. Furthermore, the parameters used in estimating the WACCs are not expected to be significantly different if the estimation were delayed by a few months and should have minimal impact on the WACCs estimated in this Determination Notice. For instance, with the updated parameters, the difference between the WACCs estimated in the Consultation Document and the WACCs estimated in this Determination Notice is only between -0.1% and +0.7% (depending on the currency). The methodology utilized in the estimation of the WACCs ensures some stability by using 5 year averages for some parameters. It also dampens the recency effect.

2.10. The issue raised by Digicel regarding the impact of the COVID-19 pandemic on the WACC parameters is addressed in Chapter 4.

Determination 1: The WACCs will become effective on 2021 November 28 and remain in effect for five (5) years.

Estimation of Separate WACCS

OUR's Proposal

2.11. In Determination 2 of the 2016 Determination Notice, it was determined that "The Office will estimate separate WACCs for fixed line and mobile carriers". In the Consultation Document, the Office outlined its intention to take account of the differences in the risk and capital structure of fixed carriers and mobile carriers by calculating separate WACCs for the fixed and the mobile sectors. Additionally, each computed WACC would be utilised as an input for separate fixed and mobile cost models.

2.12. These WACCs would be representative of the cost of capital for a generic fixed line or a mobile carrier operating in Jamaica. Therefore, it would be unnecessary to calculate the WACC for any individual company in the industry.

Stakeholders' Comments

2.13. Digicel and CACU agreed with the estimation of separate WACCs for fixed and mobile operators in Jamaica. Digicel acknowledged however, that there has been some consolidation of fixed and mobile offerings since the last WACC consultation but reiterated that the investment profile of both services remains distinct. Digicel also pointed out that the WACC will be used in conjunction with the different fixed and mobile cost models developed by the OUR, and that given the possibility for standalone operators in either segment of the sector, using a single combined "telecommunications" WACC would not be appropriate to model a standalone fixed or mobile operator.

2.14. Flow has indicated that it does not agree with the OUR's approach to estimate separate WACCs for fixed and mobile operators, noting that there is no economic basis for the WACCs to be different. Flow stated that the offerings of operators in Jamaica include a mix of wireless and wireline services, and that the convergence of the services suggests that sources of capital should be seen as equivalent for fixed and mobile services. The company opined that convergence will increase in the future and that mobile operators tend to reduce the cell-radii (increasing fibre deployment) to accommodate the increasing demand of high-quality mobile broadband services leading to differences in little else but the access networks. In addition, Flow mentioned that the uncertainty regarding take-up for fixed access networks could increase the cost of capital for fixed networks compared to mobile. Finally, Flow has recommended establishing a forward-looking single estimate of the WACC for all telecommunication operators, to promote efficiency and provide a level playing field.

2.15. In its comments on Digicel's response to the Consultation Document, Flow acknowledged that fixed-mobile convergence is still on going in Jamaica. However, Flow pointed out that given that the WACC is measured on a forward-looking basis, the WACC estimate should not rely on the completion of the convergence process as a pre-requisite to establishing a unified WACC. Flow also mentioned that the service offerings of the operators in Jamaica are quite similar and that there is not much substantial difference remaining between the two licensees' operations. Flow further commented that using separate WACCs for fixed and mobile operators is not best practice today and is not universal across the world. Flow stated that some of the benchmarks included in the OUR's Consultation Document resulted in the same or similar WACC for fixed and mobile networks. Flow therefore suggested that the OUR consider a single WACC of 9.5%, for both fixed and mobile networks.

2.16. In its comments on Flow's response to the Consultation Document, Digicel noted that there are distinct attributes to the fixed and mobile markets to justify the estimation of separate WACCs. According to Digicel, whilst it is agreed that the technologies are converging, Digicel was of the view that

"these convergences do not exist in the access network, which is a major sink for investment in both markets".

2.17. Digicel further stated that, while it has started some fixed network deployment, it remains primarily a mobile service provider. The company also commented that there are a number of Domestic Carrier or Service Provider Licensees in Jamaica, who do not provide mobile services. Furthermore, Digicel pointed out that there are fundamental differences at the commercial level between the fixed and mobile sectors in Jamaica, such as the dominance of post-paid contracts in the fixed market versus prepaid contracts in the mobile market that further warrant the differentiation between the WACCs for fixed and mobile carriers.

OUR's Response

2.18. The OUR agrees with Flow and Digicel that there is an on-going process towards the convergence of fixed and mobile services in Jamaica. However, the fact remains that there is still some time before complete convergence. Additionally, the financials of telecommunication operators around the world show a different level of cost of capital between those providing fixed services from those providing mobile services. In particular, from the international sources shown in this Determination Notice, it is observed that whenever an NRA has decided to estimate different WACCs for fixed and mobile markets, the WACC for the mobile market tends to be higher than the one for fixed markets. Moreover, even though some regulators may define a single WACC, it is also a common international practice to define separate WACC figures for mobile and fixed services. In the Office's view, defining separate WACCs is the most suitable approach as it provides appropriate price signals for existing operators (converged or standalone) as well as potential new entrants in fixed and/or mobile markets.

2.19. Based on the above, the OUR has maintained the approach presented in the Consultation Document and has defined separate WACCs for fixed and mobile telecommunications carriers in Jamaica.

Determination 2: The Office will estimate separate WACCs for fixed line and mobile telecommunications carriers in Jamaica.

WACC Framework

2.20. The WACC refers to the average rate of return a company expects to compensate all its different investors, weighing each financing source in the company's capital structure, which typically consists of equity and debt. The weights reflect the share of each financing source. Specifically, the nominal WACC is estimated using the following equation:

$$WACC = w_d * k_d + w_e * k_e$$

where:

- w_d – is the fraction of debt in the capital structure,
- k_d – is the forward-looking cost of debt,
- w_e- is the fraction of equity in the capital structure,
- k_e – is the forward-looking cost of equity.

Tax Adjustment

2.21. As indicated in the 2016 Determination Notice, the OUR will estimate an after-tax cost of capital and a pre-tax cost of capital.

2.22. The after-tax cost of capital reflects the fact that interest paid to debt holders is tax deductible (that is, corporate taxes are applicable after interest is deducted). Thus, the cost of debt is also calculated as an after-tax cost to ensure that it is comparable with the cost of equity, which is calculated after-tax.

2.23. The corporate tax rate for Jamaica related to a regulated company is 33.33%[1].

2.24. The after-tax nominal weighted average cost of capital is calculated as shown in the following equation.

$$After - Tax\ WACC = w_d * k_d * (1 - t) + w_e * k_e$$

where:

- w_d – is the fraction of debt in the capital structure,
- k_d – is the forward-looking cost of debt,
- w_e- is the fraction of equity in the capital structure,
- k_e – is the forward-looking cost of equity.
- t – is the tax rate.

2.25. The nominal pre-tax cost of capital represents a grossing up of the calculated after-tax WACC such that the return allowed to the regulated company before it pays taxes is equivalent to the return allowed after it pays taxes. This is estimated based on the following equation:

$$Pre - Tax\ WACC = \frac{After - Tax\ WACC}{1 - t}$$

[1] Jamaica- Corporate - Taxes on corporate income. http://taxsummaries.pwc.com/ID/Jamaica-Corporate-Taxes-on-corporate-income

Chapter 3: Gearing

Introduction

3.1. The gearing is defined as the ratio between liabilities and the total capital employed. It shows how much of a firm's capital is comprised of debt versus equity. The gearing is calculated as follows:

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

3.2. Where:

- D represents the **Debt**.
- E represents the **Equity**.

3.3. There are three approaches to determining the level of gearing to be utilised in the estimation of the WACC:

- Book-value gearing
- Market value gearing
- Optimal gearing

Gearing – Methodology

OUR's Proposal

3.4. As stated in the 2016 Determination Notice, the OUR prefers the use of optimal (notional) gearing rather than book-value gearing. This is because the WACC is an input to the models developed by the OUR that are based on the network of a hypothetical efficient operator. The 2016 Determination

Notice was, in this regard, also consistent with the 2010 WACC Determination Notice[2] using the same methodology for the calculation.

3.5. In the Consultation Document, the OUR indicated that it was of the view that optimal gearing is still the best approach to calculate the WACC for the proposed period.

Stakeholders' Comments

3.6. Flow in its comments noted that it approves of the optimal gearing approach. No other stakeholder feedback was received by the OUR on its proposal to use the optimal gearing method to calculate the WACC for the proposed period.

OUR's Response

3.7. The OUR acknowledges the feedback from Flow.

Determination 3: The OUR will utilise optimal gearing to calculate the WACC for the proposed period.

Gearing - Values

OUR's Proposal

3.8. In the 2010 Determination Notice, the Office established a gearing range of 10%-30% for fixed line operators and a range of 10%-20% for mobile carriers.

3.9. In the 2016 Determination Notice, the Office established a gearing range of 15%-30% for fixed line operators and a range of 15%-25% for mobile carriers. The figures were revised in 2016 to reflect observed changes in the market conditions of telecom operators worldwide.

[2] "Determination Notice - Estimate of the Weighted Average Cost of Capital for Telecommunications Carriers" document No. TEL2009005_DET001, (2010 Determination Notice),

3.10. To validate the ranges considered for the gearing, the OUR analysed the current average gearing for operators in different regions across the world, as well as its evolution since 2010. This is shown in Exhibit 1 below.

Exhibit 1: Market Value Gearing by Region for the 2010-2020 period

Telecom Services Fixed	2010	2015	2020	Telecom (Wireless) Mobile	2010	2015	2020
US	31.99%	43.85%	44.19%	US	16.55%	60.09%	56.75%
Europe	48.70%	44.72%	54.12%	Europe	33.33%	39.60%	56.95%
Japan	47.18%[3]	31.18%	34.01%	Japan	23.98%[3]	38.27%	44.29%
Emerging	**26.85%**	**26.75%**	**31.80%**	**Emerging**	**16.32%**	**26.16%**	**34.83%**
Global	37.75%	39.41%	43.30%	Global	24.16%	35.64%	43.20%

Source: Damodaran[4]

3.11. The data presented above shows that the average market value gearing in emerging markets (and globally) has increased significantly between 2010 and 2020. Furthermore, the figures for market value gearing for 2020 fall above the range defined in the 2016 Determination Notice.

3.12. Therefore, the OUR proposed that the range considered in the calculation of the market value gearing should be updated to reflect the trends observed in emerging and global markets.

3.13. These findings are aligned with the latest WACC regulatory decisions made by National Regulatory Authorities (NRAs) worldwide[5]. Exhibit 2 below summarizes the latest figures approved, by a number of NRAs, for gearing (between the years 2016 and 2019).

[3] Values from 2011 since it corresponds to the oldest available data
[4] Damodaran (2020). http://pages.stern.nyu.edu/~adamodar/New_Home_Page/dataarchived.html
[5] Only decisions from 2016 or later have been considered to ensure the relevancy of the figures

Exhibit 2: Gearing Used in Recent WACC Regulatory Decisions from NRAs Worldwide (2016-2019)

Telecom fixed services	Min	Max	Point Esti.
ANACOM	27.38%	56.89%	41.89%
MCA	40.00%	50.00%	45.00%
ictQatar	20.00%	42.50%	32.00%
ComReg	40.00%	40.00%	40.00%
PTS	17.00%	64.00%	38.00%
BIPT	15.18%	72.37%	46.00%
IFT	55.37%	55.37%	55.37%
SUTEL	15.41%	15.41%	15.41%
ENACOM	27.14%	27.14%	27.14%
ECTEL	34.27%	34.27%	34.27%
Bundesnet zagentur.	31.26%	73.82%	50.28%
GNCC	12.00%	78.00%	46.00%
Average	**27.92%**	**50.81%**	**39.28%**

Telecom mobile services	Min	Max	Point Esti.
ANACOM	27.38%	56.89%	41.89%
MCA	35.00%	45.00%	40.00%
ictQatar	20.00%	42.50%	32.00%
ComReg	35.00%	35.00%	35.00%
PTS	35.00%	35.00%	35.00%
BIPT	15.18%	72.37%	32.00%
IFT	50.30%	50.30%	50.30%
SUTEL	15.41%	15.41%	15.41%
ENACOM	27.14%	27.14%	27.14%
ECTEL	34.27%	34.27%	34.27%
Bundesnet zagentur.	31.26%	73.82%	50.28%
GNCC	12.00%	78.00%	46.00%
Average	**28.16%**	**47.14%**	**36.61%**

Source: OUR based on data from NRAs[6]

3.14. Based on the above, the OUR in its Consultation Document proposed to update the gearing ranges to reflect the changes in market conditions in the last few years. The OUR indicated that the range would be based on:

i. the gearing observed for emerging markets for 2020 (as can be seen in Exhibit 1) and
ii. the figures extracted from international practice for NRAs (as can be seen in Exhibit 2).

3.15. The range of values proposed for the gearing were **31.80% - 39.28%** for fixed line networks and **34.83% - 36.61%** for mobile networks.

3.16. In line with the 2016 methodology, the OUR indicated that the gearing for each segment of the sector would be obtained by averaging the minimum and maximum values of the range. Therefore, the gearing ratios proposed

[6] Please see Annex A for the sources (including the date of approval) employed for each country

to be used in the estimation of the WACCs were 35.54% for fixed and 35.72% for mobile.

Stakeholders' Comments

3.17. Flow[7], Digicel and CACU agreed with the approach and the values presented by the OUR. Flow stated that both estimated ratios are comparable and at appropriate levels. Digicel stated that based on the chosen comparators the proposed values are within the expected range.

3.18. However, Flow also stated that it objects in principle to the calculation of separate optimal gearing ratios for fixed and mobile. Flow further noted that the WACC study completed by regulators in the five ECTEL states and Curacao estimated a single gearing ratio for all telecommunications providers.

OUR's Response

3.19. The OUR acknowledges the feedback from Flow, Digicel and CACU.

3.20. For the reasons discussed in Chapter 2 of the Determination Notice and as set out in Determination 2, separate WACCs will be estimated for fixed and mobile telecommunications carriers. In light of this, separate parameters will be estimated for each WACC.

Determination 4: The gearing for fixed line carriers will be 35.54% and for mobile carriers it will be 35.72%.

[7] Flow emphasizes that it does not agree with the disaggregation of the parameters between fixed and mobile providers, suggesting a single parameter should be calculated.

Chapter 4: Cost of Debt

Introduction

4.1. The cost of debt is associated with the interest payments that a business needs to make to its banks, financial institutions and other creditors.

4.2. Cost of debt is typically higher for companies that experience (or may experience) more difficulties repaying their debts, while it is lower for those that have a better ability to repay their debts.

4.3. Aligned with the methodology presented in the previous WACC Determination Notices, the cost of debt has been estimated using the following equation:

$$k_d = r_f + CRP + D_p$$

where:

- r_f is the risk free rate
- CRP, Country Risk Premium, is the sovereign default spread
- D_p is the debt premium

4.4. It should be noted that this approach is consistent with the approach followed by other regulators in recent regulatory decisions.

Risk-Free Rate - Methodology & Values

OUR's Proposal

4.5. The risk-free rate reflects the remuneration for assets that are free of risk. It shows investors' expectations of the return from a risk-free asset over a period. A debt instrument, which is closest to being free of default risk, is generally used as the risk-free rate.

4.6. Based on the methodology established in the 2016 Determination Notice and recent regulatory best practices, the OUR indicated that it would use

the United States of America (US) Government Treasury security as the risk-free asset.

4.7. The risk-free rate proposed in the Consultation Document was calculated based on the average market yield on U.S. ten (10) year Treasury Bonds at constant maturity using monthly data for the most recent five (5) years.

4.8. The monthly data of the market yield on U.S. ten (10) year Treasury Bonds was extracted from Damodaran[8]. Based on the data from Damodaran, the OUR proposed a risk-free rate of 2.26%.

Stakeholders' Comments

4.9. Both Flow[9], and CACU agreed with the approach presented by the OUR. Flow has indicated that it found the estimate of 2.26% for both mobile and fixed segments to be a reasonable input to the OUR's WACC calculations.

4.10. Digicel in its response to the Consultation Document indicated that given the COVID-19 pandemic, the past trends on which the Office relied for the proposed risk free rate are unlikely to be a reliable basis for the forecasting of future risk free rates. The company noted that the pandemic has brought uncertainty regarding the "risk-free" investment in US treasury bonds, and that there has been a sharp decrease in the yield of such bonds in recent months. Digicel stated that the figures included by the OUR (2.26%) may be overstated, due to the decline in the yield of 10-year US treasury bonds. The company said this fact is even more of a concern given that the OUR is using a data sequence that ends mid-2020 when the rates are not due to be changed until November 2021.

4.11. In its response to Digicel's comments, Flow disagreed that the pandemic has substantially increased financial risk, or that this increased financial risk has created mismeasurement when estimating the cost of capital. Whilst

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[8] Damodaran (2020). http://www.stern.nyu.edu/~adamodar/pc/implprem/ERPbymonth.xlsx
[9] Flow emphasizes that it does not agree with the disaggregation of the parameters between fixed and mobile providers, suggesting a single parameter should be calculated.

Flow agreed that the pandemic has created an immediate and unprecedented disruption to economies worldwide, it was also of the opinion that interventions by governments and central banks worldwide have been unprecedented.

OUR's Response

4.12. The OUR does not agree with Digicel's comments regarding the impact of COVID-19 resulting in the potential overstatement of the risk-free rates The comparison of the estimated risk free rate to the current risk free rate is not an appropriate comparison. The estimated risk free rate is meant to be a forward-looking estimation of the risk free rate over the regulatory period (likely 5 years). As with any projection of the future, there is uncertainty. The OUR is of the view that in the face of inherent uncertainty such as in the case of the current pandemic, its best option is to take a neutral approach as the positive and negative impacts of the pandemic on parameters such as the risk-free rate may balance out each other. It should be noted that this view is also shared by BEREC[10] in its report on WACC parameter calculations.

4.13. Furthermore, given the process involved in the update of the WACCs, it is necessary to start the process significantly ahead of their implementation date. Additionally, as noted in paragraph 2.8 having a determination on the WACCs before making a determination on the updated cost models is ideal. This provides regulatory certainty as it allows operators to see what the determined rates will be over the five-year period.

4.14. Therefore, the OUR maintains that the methodology of estimating the risk-free rate by considering a monthly average of the most recent five (5) years remains the most robust approach, striking a reasonable balance between timeliness of the data and stability. In keeping with its stated intent, the OUR

[10]BEREC Report on WACC parameter calculations according to the European Commission's WACC Notice https://berec.europa.eu/eng/document_register/subject_matter/berec/reports/9364-berec-report-on-wacc-parameter-calculations-according-to-the-european-commission8217s-wacc-notice.

has updated the risk-free rate[11] utilizing data beyond mid-2020. This update results in a risk-free rate of **2.11%**.

4.15. As can be seen in Exhibit 3, the proposed value is aligned with the latest WACC regulatory decisions observed in other countries around the world.

Exhibit 3: Risk-Free Rates from Recent Regulatory Decisions and OUR values

Regulator	Risk-free rate
ANACOM	2.80%
MCA	1.95%
ictQatar	3.50%
ComReg	3.43%
PTS	1.39%
BIPT	0.80%
IFT[12]	4.90%
SUTEL	2.31%
ENACOM	3.46%
ECTEL	2.71%
Bundesnetzagentur	2.41%
GNCC[12]	9.92%
Average	**2.48%**
OUR	**2.11%**

Source: OUR based on data from NRAs[13]

4.16. Based on the methodology for the estimation of the risk-free rate, a risk-free rate of **2.11%** is utilised for the WACC calculation.

Determination 5: The estimated risk-free rate is 2.11% for both fixed line and mobile carriers.

[11] Based on data from Damodaran,
[12] Not considered in the average since it is considered an outlier, this is because the risk-free rate used corresponds to the country's own risk.
[13] Please see Annex A for the sources employed for each country

Country Risk Premium – Methodology and Values

OUR's Proposal

4.17. The country risk premium (CRP) is a measure of the additional risk premium that investors require for investing in securities issued by the Government of Jamaica (GOJ) relative to comparable risk-free securities. Specifically, the CRP computed in this document is a measure of the specific risk associated with investing in Jamaica.

4.18. Aligned with the methodology followed previously by the OUR, the bond default spread is considered as a valid measure of the CRP. This is the difference between the yield to maturity of a debt instrument issued by an AAA rated (risk free) government, and the yield to maturity of an internationally traded debt instrument with comparable features issued by the government of the country for which the CRP is being calculated.

4.19. Specifically, the CRP has been estimated based on the following equation:

$$CRP = Domestic\ bonds - r_f$$

where:

- CRP is the Country Risk Premium
- $Domestic\ bonds$ is the yield to maturity on GOJ ten (10) year US$ bonds
- r_f is the risk free rate (previously calculated)

4.20. In the Consultation Document, the OUR proposed that the country risk premium will be obtained by subtracting the risk free rate presented in the previous section from a domestic ten (10) year bond issued by the Government of Jamaica and denominated in USD. The figure proposed in the Consultation Document was 3.42%. The OUR proposed that this figure be equivalent for the WACC of both fixed and mobile carriers.

Stakeholders' Comments

4.21. As in the risk-free rate response, Digicel argued that the historical data used to estimate the CRP is based on stable economic conditions with improvements in Jamaica's economy and GDP/Debt ratio. Digicel contended that the impact of the COVID-19 pandemic will worsen the macroeconomic conditions in the future and therefore the estimates that CRP are based upon cannot be relied on for forward projections. Thus, the company is of the view that the figures presented in the Consultation Document will likely lead to a significant underestimation of the CRP for the regulatory period.

4.22. Conversely, Flow and CACU agreed with the approach and figures set out by the OUR in the Consultation Document. Furthermore, in its comments on responses, Flow objected to Digicel's arguments and suggested that the pandemic has not substantially increased financial risk. The company supported its view by presenting financial metrics and forecasts which showed no material reduction in investor confidence in either equity or debt markets.

OUR's Response

4.23. The OUR disagrees with Digicel that the CRP is likely to be significantly underestimated because the COVID-19 pandemic has increased financial risk in Jamaica. Digicel has not presented any quantitative data in support of its claim of increased financial risk in Jamaica. Contrary to Digicel's claim, the OUR has observed a decrease in the yield of the domestic bonds utilised in the definition of the CRP in recent months. Moreover, given the global nature of the pandemic, Digicel has not provided any information to validate the suggestion that should such an increase in financial risk occur, the proportional increase in financial risk would be greater in Jamaica than the US.

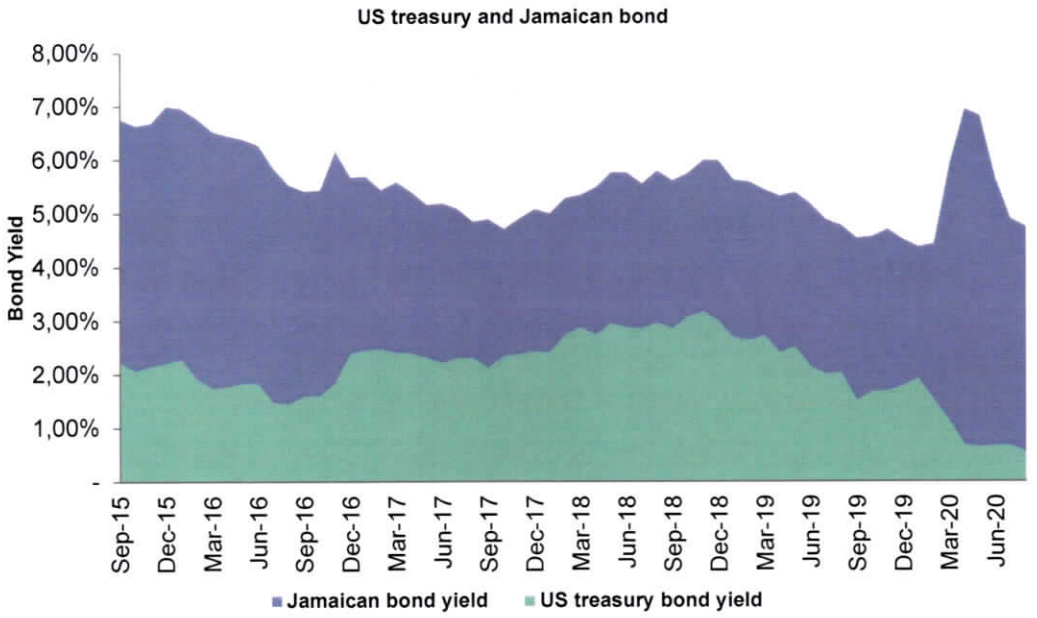
4.24. In keeping with the intent stated in the Consultation Document, and consistent with the update to the risk-free rate, the OUR has updated the figures utilised in the definition of the CRP based on the most recent data.

4.25. As indicated above, the CRP was calculated based on the following parameters:

- **Domestic Bond:** Corresponds to a ten (10) year US$ bond issued by the Government of Jamaica (GOJ). This parameter was extracted from the financial information source, Bloomberg. Particularly, we considered the figures from the BV10JAMA BVLI Index, which represents the yield of a 10-year bond issued by the Government of Jamaica denominated in USD. In order to be consistent with the risk-free rate, the domestic bond is calculated based on an average of the monthly data for the most recent five (5) years. Based on this source, the yield of a 10-year bond issued by the GOJ presents an average of **5.57**%.
- **Risk-free Rate:** As presented in the previous section, the risk-free-rate has been evaluated at **2.11**%, based on the yield of an equivalent bond issued by the government of the United States of America.

4.26. In Exhibit 4, the evolution of the risk-free rate and the domestic bond are presented.

Exhibit 4: Evolution of the Risk-Free Rate and Country Risk Premium



Source: Damodaran and Bloomberg

4.27. To be consistent with the estimation of the risk free rate, a range of five years was used for estimating the CRP. Therefore, using the CRP equation in paragraph 4.19, the figures for the CRP used in the WACC calculation are presented in Exhibit 5.

Exhibit 5: Country Risk Premium

Parameter	Lower limit	Higher limit	Point estimate
Domestic Bond [a]	5.57%	5.57%	5.57%
Risk -free rate [b]	2.11%	2.11%	2.11%
Country Risk Premium [a-b]	**3.46%**	**3.46%**	**3.46%**

Source: OUR based on data from financial sources

4.28. The CRP was obtained by subtracting the risk-free rate from the domestic bond. Therefore, the CRP value used in the determination of the WACC is **3.46%.** This figure is equivalent for the WACC of both fixed and mobile carriers.

Determination 6: The estimated country risk premium is 3.46% for both fixed line and mobile carriers.

Debt Premium – Methodology and Values

OUR's Proposal

4.29. The debt premium is company specific and represents the average excess premium on the company's bond relative to the yield on a comparable sovereign bond of the country in which the company operates.

4.30. Due to a lack of available data on bonds issued by Jamaican operators, the OUR still believes that in order to estimate the debt premium a benchmark of recent regulatory decisions should be used.

4.31. The OUR proposed, in the Consultation Document, to utilise a benchmark of recent regulatory decisions for the calculation of the debt premium. The data utilised are presented in Exhibit 6 below.

Exhibit 6: Recent Regulatory Decisions on Debt Premium

Regulator	Minimum	Maximum	Average
ANACOM	1.58%	1.58%	1.58%
MCA	1.00%	2.00%	1.50%
ictQatar	1.37%	1.68%	1.53%
ComReg	1.45%	1.50%	1.48%
PTS	1.90%	1.90%	1.90%
IFT	1.35%	1.35%	1.35%
SUTEL[14]	3.85%[15]	3.85%	3.85%
ENACOM	1.50%	1.50%	1.50%
ECTEL	1.75%	1.75%	1.75%
BIPT	1.90%	1.90%	1.90%
Bundesnetzagentur	1.47%	1.47%	1.47%
GNCC	1.51%	1.51%	1.51%
Average	**1.53%**	**1.65%**	**1.59%**

Source: OUR based on data from NRAs[16]

4.32. A reasonable range was defined in order to calculate the debt premium. The limits have been calculated as follows:

- The lower limit was calculated as the average of the minimum values of the benchmarked regulators.
- The higher limit was calculated as the average of the maximum values of the benchmarked regulators.

In the Consultation Document, the OUR proposed the following range for the debt premium: 1.53% – 1.65%. The value for debt premium proposed in the Consultation Document was **1.59%,** which is the average of the proposed limit values.

[14] Not considered in the average since it is considered an outlier. Figure calculated based on remaining WACC parameters provided by SUTEL

[15] Please note that the SUTEL figures presented in the consultation document (4.15%) were amended due to an error in the calculations following an issue with the extrapolation of data for the purpose of this comparison. As indicated in this exhibit 6, the figures for SUTEL have now been amended to reflect 3.85%, from 4.15% as was stated in the Consultation Document.

[16] Please see Annex A for the sources employed for each country.

Stakeholders' Comments

4.33. Flow and CACU agreed with the approach set out in the Consultation Document concerning the methodology and values considered for the debt premium.

4.34. Digicel pointed out that the Office has not offered an analysis on why the SUTEL figures which were excluded (as outliers) from the benchmark average were not appropriate comparators. Digicel noted that "the Office decided on the criteria of comparators for determining the benchmark (sic) i.e. they were recent regulatory decision (sic) which assessed the debt premium". The company posited that excluding comparators, which otherwise meet the criteria, because they do not meet the OUR's expectations raises the issue of pre-judgement. Additionally, Digicel has questioned the use of the next highest values in the calculations.

OUR's Response

4.35. Regarding Digicel's comments, the OUR would like to note that only one reference (SUTEL) has been deleted from this benchmark due to:

i) a different methodology being used in its calculation. SUTEL does not specify an exact debt premium. As an alternative, and solely for benchmarking purposes, the figure was extrapolated from other figures included in the report (i.e. cost of debt: 9.92%, risk-free rate: 2.31% and country risk premium: 3.46%). In addition, the cost of debt data used by SUTEL is based solely on data from local operators in Costa Rica (for the fiscal year ending in 2016). This, in the OUR's view, can lead to "home bias" that is not present in the other calculations as they are considered an international sample of companies.

ii) the reference having a z-score greater than 3. A z-score describes the position of a measure in terms of its distance from the mean, when measured in standard deviation units. Commonly, a z-score greater than 3 or lower than -3 is considered an outlier. For comparison, the references from PTS or BIPT (1.90% & 1.90%),

mentioned by Digicel, show figures much closer to the remaining ones (z-score of 0.13). Furthermore, the OUR finds that all remaining sources are within a reasonable range of the average of the sample.

4.36. The OUR would like to reject the notion of pre-judgement with regard to these figures, as the only treatment performed for these figures is linked to the removal of any outlier reference. If the outlier had been a figure that is significantly below the average of the samples, it would also have been excluded.

4.37. It should be noted that the update of the calculations for SUTEL's debt premium (see Exhibit 6), do not affect the conclusions drawn from our analysis. This is because the updated figures were still removed from the benchmark due to the reasons discussed in paragraph 4.35.

4.38. Based on the foregoing, the OUR will retain the range for the debt premium which was proposed in the Consultation Document, i.e. 1.53% – 1.65%.

4.39. Thus, the OUR has utilised a debt premium of **1.59%** in the calculation of the WACC. This figure represents the average of the limit values (i.e. 1.53% – 1.65%).

Determination 7: The estimated debt premium is 1.59% for both fixed line and mobile carriers.

4.40. The cost of debt has been calculated based on the following equation (as stated at the beginning of Chapter 4):

$$k_d = r_f + CRP + D_p$$

The cost of debt is therefore estimated to be between **7.10% - 7.22%** as shown in the exhibit below. Specifically, the point estimate of the cost of debt used in determining the cost of capital is **7.16%** for fixed and mobile carriers.

Exhibit 7: Calculation of the Cost of Debt

Parameters	Min	Max	Point estimate
Risk Free Rate	2.11%	2.11%	2.11%
Country Risk Premium	3.46%	3.46%	3.46%
Debt premium	1.53%	1.65%	1.59%
Cost of debt (K_d)	**7.10%**	**7.22%**	**7.16%**

Source: OUR

Determination 8: The estimated cost of debt is 7.16% for both fixed line and mobile carriers.

Chapter 5 Cost of Equity

Introduction

5.1. The cost of equity is the return that is required by shareholders for their investment in a company.

5.2. As indicated in previous Determination Notices, many approaches can be followed in order to estimate the cost of equity. Aligned with the methodology followed in these aforementioned Determination Notices and with international best practice, the capital asset pricing model (CAPM) is the preferred method for estimating the cost of equity.

5.3. The CAPM is a theory that describes the relationship between a security's risk or a portfolio of securities' risk and the expected rate of return associated with that risk.

5.4. The OUR is of the view that it is best to use the CAPM methodology, for the calculation of the cost of equity, adding a risk measure associated with the Jamaican market (or country risk). This is so that the volatility associated with the operation of the company in that environment is taken into account. Based on this, the cost of equity is calculated using the following equation:

$$k_e = r_f + \beta_e(MRP + CRP)$$

where:

- k_e is the forward-looking cost of equity
- r_f is the risk-free rate, equivalent to the one calculated in Chapter 4
- β_e is the Equity Beta
- MRP is the Market Risk Premium
- CRP is the Country Risk Premium

Beta – Methodology and Values

OUR's Proposal

5.5. The equity beta of a company shows the systematic risk that the company is facing relative to the average company in the market. It is measured by the relationship between returns of the selected company's shares and the returns of a market index.

5.6. As proposed and established in the 2016 Determination Notice, in order to estimate beta, it was necessary to benchmark comparable fixed and mobile companies.

5.7. A comparable company is a company that operates in the same sector with a business mix similar to that of the operators in Jamaica.

5.8. These companies were taken from more developed markets where the required data is readily available. In choosing the set of comparable companies, and in line with the previous Determination Notice, the following criteria were used:

a) The comparable companies were:
    1. Pure fixed line operators[17]
    2. Pure mobile operators
b) The companies chosen must be publicly traded on a major stock exchange so that reliable and extensive data for the company can be obtained.

5.9. The beta coefficient for comparable companies were calculated with figures from the last five (5) years, sampled on a monthly basis.

5.10. The betas for the comparable companies were un-leveraged using the following formula:

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[17] It should be noted that the fixed network companies usually offer triple play services (fixed line, internet, and entertainment/cable).

$$\beta_u = \frac{\beta_l}{1 + (1 - t)(D/E)}$$

where:

- β_l is the levered (raw) adjusted beta
- β_u is the unlevered beta
- t is the tax rate of the company´s country
- D/E is the debt/equity ratio of each individual company

5.11. Then, the unlevered beta from each company was re-levered based on the following formula:

$$\beta = \beta_u \cdot (1 + (1 - t)(D/E))$$

where:

- β is the re-levered beta
- β_u is the unlevered beta
- t is the tax rate in Jamaica
- D/E is the debt/equity ratio used for the WACC calculation (see Chapter 2)

5.12. The resultant re-levered betas were adjusted using the Blume adjustment. The Blume adjustment is a forward-looking approach based on the assumption that over time the betas of all companies tends towards one. The calculation of the Blume adjustment was based on the following formula.

$$\beta_{Blume-adjusted} = \frac{2}{3}\beta + \frac{1}{3}$$

where:

- $\beta_{Blume-adjusted}$ is the Blume adjusted beta
- β is the re-levered beta

5.13. In the 2016 Determination Notice, the Office proposed to use an upper 95% confidence interval level in the estimation of the high range of the beta. The formula used to obtain the 95% confidence interval level beta was the following:

$$\beta_{95\%} = \beta_{Blume-adjusted} + \frac{\sigma}{\sqrt{\#\ samples} \cdot z}$$

where:

- $\beta_{95\%}$ is the 95% confidence interval level beta
- $\beta_{Blume-adjusted}$ is the average of re-levered beta (considering the Blume adjustment)
- σ is the standard deviation of the re-levered Blume beta samples
- $\#\ samples$ is the number of companies included in the sample for the calculation of beta (7 for fixed and 10 for mobile)
- z is the confidence level value, which in this case for 95% is 1.96

The OUR considers that the application of the 95% confidence interval is reasonable to ensure the representativeness of the calculated beta.

5.14. Based on the natural evolution of the telecommunications operators worldwide, it is difficult to find pure-play operators (only fixed or only mobile operators), since stakeholders tend to expand the services that they offer (fixed operators tend to offer mobile services as well as mobile operators tend to offer fixed services).

5.15. In the Consultation Document, the OUR indicated that it had updated the list of peer companies. These updates were as a result of one or more of the following:

i) the company is no longer a pure play operator;
ii) the company is not a small or medium cap operator;
iii) the company has been acquired by another operator; or
iv) other exceptional matters (e.g. bankruptcy).

The OUR asserted that companies under any of these circumstances should not be considered in the current peer group. The companies from the 2016 peer group to which these circumstances apply are as follows: Otelco, Idea Cellular, Millcom International Cellular, SK Telecom Co, Smartone Telecommunications Holdings, Far Eastone Telecommunications, Fairpoint Communications, Windstream Holdings and Cincinnati Bell. All other operators included in the previous peer group were maintained.

5.16. The OUR proposed to replace the aforementioned operators in the peer group with additional operators. In order to ensure compatibility, the OUR sought to ensure that the new operators included are small to medium cap companies. The final peer group proposed is presented in the exhibit below.

Exhibit 8: 2020 Comparable Companies (Peer Group) for the Calculation of Beta

Operators	Country	Included in the 2016 Determination Notice?
Fixed Operators		
Alaska Communications Systems Group	United States	Existing
Consolidated Communications Holdings	United States	Existing
Frontier Communications Corporation	United States	Existing
Cable One	United States	New
A1 Telekom Austria Group	Austria	New
Tele Columbus AG	Germany	New
Mobile Operators		
United States Cellular Corporation	United States	Existing
Cellcom Israel Ltd	Israel	New
Etisalat Misr	Egypt	New
Forth Smart Service Public Company Limited	Thailand	New
Tim Participacoes SA ADR (TSU)	Brazil	New
Telecom Argentina SA ADR- TEO	Argentina	New
Samart Digital Public Company Limited	Thailand	New
Turkcell	Turkey	New
VEON Ltd	Netherlands	New
Mobile TeleSystems	Russia	New

Source: OUR

5.17. In the Consultation Document, the beta coefficient for the comparable companies were extracted from the financial firm *MorningStar*[18]. The five (5) year monthly beta values were directly extracted and the most recent data available at the time of publication of the Consultation Document were utilised. In addition, the Debt and Equity values to obtain the corresponding debt to equity ratio (D/E) were also extracted from *MorningStar*[18] using the most recent available data at the time of publication of the Consultation Document.

5.18. The actual data involved in this calculation is included in Annex C.

5.19. Considering the approach presented above, the proposed 95% confidence interval betas presented in the Consultation Document were as follows:

- **0.697 for the fixed sector; and**
- **0.918 for the mobile sector**.

5.20. In order to validate these figures, we analysed the betas determined by other regulatory entities around the world in recent WACC decisions, to verify that the figures determined fell within the ranges identified in these decisions.

[18] MorningStar (2020). https://www.morningstar.com/

Exhibit 9: Recent Beta Regulatory Decisions with OUR values

β	Fixed	Mobile
ANACOM	0.856	0.856
MCA	0.850	0.650
ictQatar	0.990	0.990
ComReg	0.670	0.660
PTS	0.890	0.770
IFT	0.610	0.520
SUTEL	0.950	0.950
ECTEL	0.664	0.547
ENACOM	0.940	0.940
BIPT	0.710	0.810
Bundesnetzagentur.	0.910	0.910
GNCC	0.890	0.890
OUR	**0.697**	**0.918**

Source: OUR based on data from NRAs[19]

Stakeholders' Comments

5.21. Digicel and CACU agreed with the methodology and figures determined by the OUR with regard to the beta.

5.22. Flow stated that, in its view, a single beta should be considered for fixed and mobile operators, as it believed the distinction between fixed and mobile betas to be artificial and inappropriate. Furthermore, Flow suggested that this beta should be based on the average of the fixed and mobile beta figures included in the benchmark from ECTEL due to their similarity with Jamaica.

5.23. In response to Flow's comments, Digicel indicated that the very figures from ECTEL suggested by Flow include different figures for fixed and mobile markets. Furthermore, Digicel noted that Flow does not suggest that the

[19] Please see Annex A for the sources employed for each country

output of the Office's estimations for both betas are incorrect. Additionally, Digicel stated that the Office's estimation, which resulted in different betas for fixed and mobile, indicated that it was correct not to prejudge the matter of having the same beta for both fixed and mobile carriers.

OUR's Response

5.24. With regard to Flow's comment regarding having a single WACC for the sector, the OUR maintains the view that the WACC should be calculated separately for fixed and mobile networks, as presented in Chapter 2. In addition, the OUR does not agree with Flow's remarks regarding the use of the beta figures from ECTEL, as it would imply a significant deviation compared to the existing methodology, without justification. The ECTEL beta figures were provided by the operators and not calculated based on a predefined selection of companies as it is done by the OUR. Furthermore, Flow has not provided any argument or evidence why the figures used by ECTEL in 2018 are more representative than those used by the OUR.

5.25. The OUR has therefore decided to maintain the approach set out in the Consultation Document concerning beta. Furthermore, the OUR does not find it necessary to further update the beta figures proposed in the Consultation Document, given that this metric should not fluctuate heavily over short periods of time.

5.26. Based on the above, the beta values for the WACC calculation are **0.697** for the fixed sector and **0.918** for the mobile sector.

Determination 9: The beta is 0.697 for fixed line carriers and 0.918 for mobile carriers.

Market Risk Premium – Methodology and Values

OUR's Proposal

5.27. The market risk premium (MRP) also referred to as the equity risk premium (ERP) corresponds to the difference between the returns expected from equities and the return expected from risk-free assets (i.e. long-term bonds).

5.28. Aligned with the methodology followed in 2016, the OUR proposed to continue using the average of historical returns to estimate the MRP. Specifically, the OUR used the MRP derived from 1928 – 2018, which is a sufficiently long enough time period to neutralise the effects of outliers on both sides of the estimate.

5.29. In accordance with the 2016 Determination Notice, the Consultation Document defined a reasonable range in order to calculate the Market Risk Premium. The limits were calculated as follows:

- The lower limit has been calculated as the geometric average of the Market Risk Premium for the period 1928-2018, extracted from Damodaran.
- The higher limit has been calculated as the arithmetic average of the Market Risk Premium for the period 1928-2018, extracted from Damodaran.

5.30. As a result of the methodology outlined above, the OUR proposed in the Consultation Document, a range for the MRP between **4.66%** and **6.26%**. The MRP used in the calculation of the WACC in the Consultation Document was **5.46%,** which represents the average of the proposed limits (i.e. 4.66% and 6.26%).

Stakeholders' Comments

5.31. Digicel and CACU agreed with the approach and figures presented by the OUR concerning the MRP.

5.32. Flow disagreed with the OUR's approach to estimating the MRP and opined that the higher limit set out in the Consultation Document overestimates the

MRP. The company also noted that the OUR has adopted a similar approach to estimating the MRP as it did in the 2016 WACC study, which the OUR conceded at that time was *"likely to overestimate the actual premium rather than under estimate it"*. Flow suggested that only the lower bound estimate be considered if the historical approach is to be applied.

5.33. In its response to Flow's comments, Digicel urged the OUR not to eschew the proposed approach, as setting too high or low a WACC may lead to adverse market outcomes.

OUR's Response

5.34. With regard to Flow's comment, the OUR takes this opportunity to reiterate its position as stated in the 2016 Determination Notice which has not been accurately reflected in the reference made by Flow. The OUR would like to make clear that the use of historical figures, does not automatically mean that the MRP is overestimated. The OUR considers that despite the uncertainties associated with estimating the MRP using historical returns, the approach is still preferred to alternative approaches, as it is less likely to underestimate the true premium. Flow has not provided evidence to justify its position that the higher limit considered for the risk premium may be overestimated. Additionally, its suggestion that only the identified lower bound should be utilised, to counter the overestimation bias, is not grounded in evidence or facts. The OUR shares Digicel's view that implementing Flow's proposal could bring adverse effects to the market such as a lack of investment due to an underestimated WACC.

5.35. As can be seen from MRP benchmarks in Exhibit 10, the final figure determined by the OUR is aligned with MRP figures observed in international practice, which confirms that the figures considered are not overestimated.

5.36. Given the foregoing, the OUR has maintained the methodology for the calculation of the MRP set out in the Consultation Document, for the final calculation of the WACC. However, the OUR has updated the Market Risk Premium parameter, and it is now derived for the period 1928-2019, extracted from Damodaran.

5.37. Based on the methodology indicated, the new range for the MRP, as extracted from Damodaran, was **4.83% – 6.43%**. The MRP used in the calculation of the WACC is **5.63%,** which represents the average of the proposed limits.

5.38. The vast majority of the latest WACC regulatory decisions approved by NRAs worldwide, are consistent with the methodology defined by the OUR. However, the sources considered, differ in some cases. The exhibit below presents the MRPs determined in recent regulatory decisions for a number of NRAs, along with the sources employed.

Exhibit 10: Recent Regulatory Decisions on MRPs from NRAs worldwide

Regulator	MRP	Source and Methodology
ANACOM	6.98%	Average of 3 sources: Pablo Fernandez, Credit Suisse Global Investment Returns Yearbook and Damodaran
MCA	5.25%	Average of an international report (Brattle Report) and the average of the ERP of the NRAs from Europe
ictQatar	4.90%	Mean of the ERP of other countries extracted from the Dimson, Marsh and Staunton (DMS) report
ComReg	4.60%	ERP extracted from Dimson Marsh and Staunton's ("DMS") report
PTS	5.54%	Average of three values: Implicit prices (Bloomberg), historic (Credit Suisse and Damodaran) and studies (Pablo Fernandez study)
IFT	5.57%	ERP extracted from Damodaran
SUTEL	6.38%	Average of the Difference of the S&P 500 returns and the US Bonds. Source: Fred, Damodaran, investing
ECTEL	5.67%	ERP extracted from Damodaran
ENACOM	4.11%	ERP extracted from Damodaran
Bundesnetzagentur	4.73%	Average of the Arithm. Mean and Geom. Mean of the U.S., U.K. and Germany. Source: Stehle study
GNCC	6.00%	Brattle study and PwC best practice
BIPT	6.70%	Weighted average of three values: Implicit prices, historic evolution and studies (Pablo Fernandez study)
Average	**5.54%**	

Regulator	MRP	Source and Methodology
OUR	5.63 %	Geometric average and Arithmetic average of the historical MRP calculated by Damodaran for the period 1928-2018

Source: OUR based on data from NRAs[20]

Determination 10: The market risk premium used in estimating the WACC will be 5.63%, for both fixed line and mobile carriers.

5.39. The cost of equity has been calculated based on the following equation (as stated at the beginning of Chapter 5):

$$k_e = r_f + \beta_e(MRP + CRP)$$

5.40. Based on the previous equation, the cost of equity falls between **7.36%-8.65%** for the fixed sector and **9.67% - 11.25%** for mobile carriers as shown in Exhibit 11 below. Specifically, the point estimate of the cost of equity used in determining the cost of capital is **8.44%** for fixed carriers and **10.45%** for mobile carriers.

Exhibit 11: Calculation of the Cost of Equity

Parameters	Fixed			Mobile		
	Min	Max	Point estimate	Min	Max	Point estimate
Risk Free Rate	2.11%	2. 11%	2. 11%	2. 11%	2. 11%	2. 11%
Equity Beta	0.63	0.66	0.70	0.91	0.92	0.92
Country Risk Premium	3.46%	3.46%	3.46%	3.46%	3.46%	3.46%
Market Risk Premium	4.83%	6.43%	5.63%	4.83%	6.43%	5.63%
Cost of equity (K_e)	**7.36%**	**8.65%**	**8.44%**	**9.67%**	**11.25%**	**10.45%**

Source: OUR

5.41. The OUR considers that the cost of equity calculated is aligned with those determined by other regulatory entities around the world in recent WACC

[20] Please see Annex A for the sources employed for each country

decisions. A summary of the figures determined by other NRAs is presented in Exhibit 12.

Exhibit 12: Comparison of Recent Cost of Equity Regulatory Decisions with OUR values

Cost of Equity	Fixed	Mobile
ANACOM	8.77%	8.77%
MCA	6.40%	6.40%
ictQatar	9.25%	9.25%
ComReg	6.49%	6.49%
PTS	6.32%	6.32%
IFT	11.86%	11.15%
SUTEL	12.61%	12.61%
ECTEL	12.57%	10.83%
ENACOM	11.86%	11.86%
BIPT	8.00%	7.60%
Bundesnetzagentur.	6.72%	6.72%
GNCC	15.26%	15.26%
OUR	**8.44%**	**10.45%**

Source: OUR based on data from NRAs[21]

Determination 11: The cost of equity is 8.44% for fixed carriers and 10.45% for mobile carriers.

[21] Please see Annex A for the sources employed for each country

Chapter 6: Converting United States Dollar WACC to Jamaican Dollar WACC

OUR's Proposal

6.1. In order to convert the WACC parameters from US$ in which they were estimated to their J$ equivalent, the OUR used the following equation.

$$Parameter_{J\$} = (1 + Parameter_{US\$}) * \left(\frac{1 + Expected\ Inflation_{J}}{Expected\ Inflation_{US}}\right) - 1$$

6.2. It is important to note that this equation should be followed to estimate only the WACC parameters (inputs), not the WACC results. Specifically, the equation should be followed to estimate the following parameters:

- $Cost\ of\ Debt_{J\$}$
- $Cost\ of\ Equity_{J\$}$

6.3. The Nominal WACC in J$ should be obtained based on the following equation:

$$WACC_{J\$} = w_d * kd_{J\$} + w_e * ke_{J\$}$$

where:

- w_d – is the fraction of debt in the capital structure
- $kd_{J\$}$ – is the forward-looking cost of debt expressed in Jamaican dollars (J$)
- w_e- is the fraction of equity in the capital structure
- $ke_{J\$}$ – is the forward-looking cost of equity expressed in Jamaican dollars (J$)

6.4. As was stated in the 2016 Determination Notice, and is still the view of the OUR, the IMF is considered to be the best source of data for the extraction of the US and Jamaican inflation parameters.

6.5. Therefore, in line with the methodology presented in the 2016 Determination Notice, the inflation parameters calculated in the Consultation Document were extracted as the arithmetic average of the projected inflation for a five (5) year period (2020-2024). This approach resulted in an inflation rate of **4.76%** for Jamaica and a rate of **2.32%** for the USA.

Stakeholders' Response

6.6. Flow and CACU agreed with the suggested approach and figures considered for the inflation rates included in the calculation.

6.7. Digicel stated that inflation forecasts will be severely affected by the COVID-19 pandemic, and its impact at the macroeconomic level will lead to higher retail prices based on likely increases to the costs for businesses. Based on this, Digicel opined that it is premature to form a clear forward view of likely inflation trends in either the United States or Jamaica, and that the proposed figures are unlikely to be accurate. Digicel also mentioned that this dynamic is also likely to be present in the United States.

OUR's Response

6.8. The OUR does not agree with Digicel that it is premature to form a clear forward view of likely inflation trends. The inflation projections are sourced from the IMF, which is a reliable source of this type of information. In keeping with its stated intent, to update parameters where warranted before the issuance of the Determination Notice, the OUR has updated the figures presented in the Consultation Document with the latest forecasts from the IMF.

6.9. Based on the methodology outlined earlier in this Chapter, the updated inflation parameters to be considered in the calculation of the WACCs are **4.98%** for Jamaica and **1.94%** for USA.

Determination 12: The projected inflation for Jamaica is 4.98% and the projected inflation for the USA is 1.94%. These figures will apply to both fixed line and mobile carriers.

Chapter 7 : Results

OUR's Proposal

7.1. In the Consultation Document, the OUR proposed the following figures for the WACCs:

- **Fixed telecommunication sector:** A nominal pre-tax WACC of **10.75%** in US$ terms and **14.18%** in J$ terms.
- **Mobile telecommunication sector:** A nominal pre-tax WACC of **12.63%** in US$ terms and **16.09%** in J$ terms.

Stakeholders' Comments

7.2. CACU agreed with the WACC figures presented by the OUR, reflecting that they represent a decrease with regards to the figures approved in the 2016 Determination Notice.

7.3. Flow disagreed with these results, with specific disagreements on how several of the parameters, which are inputs of the WACCs, were calculated. These have already been outlined in previous sections of this document. Flow also insisted that a single WACC should be calculated for all operators (fixed and mobile) and that there should be two main changes to the WACC inputs, namely:

i) the lower value of the MRP should be selected if the historical approach to estimation is to be maintained; and

ii) the beta should be equivalent for both fixed and mobile networks and should be based on the average of the fixed and mobile beta developed by ECTEL. Based on this, Flow considered that a pre-tax WACC for fixed and mobile in Jamaica of 9.50% and 9.49% respectively, would be appropriate.

7.4. Digicel disagreed with the results, suggesting that the WACC estimates are understated, for reasons already outlined in this document. According to

Digicel, this will lead to under recovery of investment and adversely affect investment decisions in the Jamaican telecommunications market. Digicel also pointed out that the underestimation would be exacerbated by the premature calculation of the WACC and the reliance on historical trends, which are not consistent due to the uncertainty brought on by the COVID-19 pandemic.

OUR's Response

7.5. The OUR has comprehensively addressed all of the issues raised by Flow and Digicel presented under Stakeholder's Comments, in the appropriate section of this Determination Notice dedicated to the calculation of the particular parameter with which the company has disagreed. As such, the OUR will not rehash those arguments in this section of the document.

7.6. Notwithstanding, the OUR is of the view that the estimates provided in the Consultation Document and in this Determination Notice accurately reflect the costs faced by operators in Jamaica, and neither overestimates nor underestimates the true costs faced by operators. Furthermore, the approach presented in this Determination Notice ensures that methodological consistency is maintained with regards to the approach developed by the OUR in the calculation of the WACC in the 2016 Determination Notice. In the OUR's view, maintaining methodological consistency is key to ensuring regulatory certainty and avoiding any potential adverse effect in the telecommunications sector in Jamaica.

7.7. Combining the values of the various parameters estimated in the previous chapters results in the following WACC values:

- **Fixed telecommunication sector**: A nominal pre-tax WACC of **10.70%** in US$ terms and **14.96%** in J$ terms as shown in Exhibit 13 below.
- **Mobile telecommunication sector:** A nominal pre-tax WACC of **12.63%** in US$ terms and **16.95%** in J$ terms as shown in Exhibit 14 below.

Exhibit 13: Fixed Sector WACC

Parameter	Variable	Minimum	Maximum	Point Estimate
Cost of debt (K_d)				
Risk Free Rate	rf	2.11%	2.11%	2.11%
Gearing	D/(D+E)	31.80%	39.28%	35.54%
Country Risk Premium	CRP	3.46%	3.46%	3.46%
Debt premium	Dp	1.53%	1.65%	1.59%
Cost of Debt	**Kd**	**7.10%**	**7.22%**	**7.16%**
Cost of Debt - J$	**Kdj**	**10.29%**	**10.41%**	**10.35%**
Cost of Equity (K_e)				
Market Risk Premium	MRP	4.83%	6.43%	5.63%
Equity Beta	Be	0.634	0.662	0.697
Tax Rate	T	33.33%	33.33%	33.33%
Expected Inflation - Jamaica	ij	4.98%	4.98%	4.98%
Expected Inflation - U.S.	ius	1.94%	1.94%	1.94%
Cost of Equity	**Ke**	**7.36%**	**8.65%**	**8.44%**
Cost of Equity - J$	**Kej**	**10.56%**	**11.89%**	**11.67%**
Nominal WACC (USD)				
WACC	**WACC**	**7.28%**	**8.09%**	**7.98%**
After-Tax WACC	**After-Tax WACC**	**6.52%**	**7.14%**	**7.13%**
Pre-Tax WACC	**Pre-Tax WACC**	**9.79%**	**10.71%**	**10.70%**
Nominal WACC (JMD)				
WACC	**$WACC_j$**	**10.47%**	**11.31%**	**11.20%**
After-Tax WACC	**After-Tax $WACC_j$**	**9.38%**	**9.95%**	**9.98%**
Pre-Tax WACC	**Pre-Tax $WACC_j$**	**14.08%**	**14.92%**	**14.96%**

Source: OUR

Exhibit 14: Mobile Sector WACC

Parameter	Variable	Minimum	Maximum	Point Estimate
Cost of debt (K_d)				
Risk Free Rate	rf	2.11%	2.11%	2.11%
Gearing	D/(D+E)	34.83%	36.61%	35.72%
Country Risk Premium	CRP	3.46%	3.46%	3.46%
Debt premium	Dp	1.53%	1.65%	1.59%
Cost of Debt	**Kd**	**7.10%**	**7.22%**	**7.16%**
Cost of Debt - J$	**Kdj**	**10.29%**	**10.41%**	**10.35%**
Cost of Equity (K_e)				
Market Risk Premium	MRP	4.83%	6.43%	5.63%
Equity Beta	Be	0.912	0.924	0.918
Tax Rate	T	33.33%	33.33%	33.33%
Expected Inflation - Jamaica	ij	4.98%	4.98%	4.98%
Expected Inflation - U.S.	ius	1.94%	1.94%	1.94%
Cost of Equity	**Ke**	**9.67%**	**11.25%**	**10.45%**
Cost of Equity - J$	**Kej**	**12.94%**	**14.56%**	**13.74%**
Nominal WACC (USD)				
WACC	**WACC**	**8.77%**	**9.77%**	**9.27%**
After-Tax WACC	**After-Tax WACC**	**7.95%**	**8.89%**	**8.42%**
Pre-Tax WACC	**Pre-Tax WACC**	**11.92%**	**13.33%**	**12.63%**
Nominal WACC (JMD)				
WACC	**$WACC_j$**	**12.01%**	**13.04%**	**12.53%**
After-Tax WACC	**After-Tax $WACC_j$**	**10.82%**	**11.77%**	**11.30%**
Pre-Tax WACC	**Pre-Tax $WACC_j$**	**16.23%**	**17.66%**	**16.95%**

Source: OUR

7.8. As a final comparison, Exhibit 15 presents the nominal pre-tax WACC (in USD) of recent regulatory decisions from NRAs worldwide. As can be seen, the WACCs estimated for the fixed and the mobile sector in Jamaica are relatively aligned with the benchmarked regulators.

Exhibit 15: WACC Benchmark

Regulator	Fixed	Mobile
ANACOM	9.07%	9.07%
MCA	6.98%	6.34%
ictQatar	10.45%	10.45%
ComReg	6.42%	6.53%
PTS	6.30%	7.80%
IFT	8.75%	8.67%
SUTEL	12.20%	12.20%
ECTEL	15.50%	16.25%
ENACOM	15.68%	15.68%
BIPT	6.86%	7.98%
Bundesnetzagentur	6.40%	6.40%
GNCC	14.95%	14.95%
Average	**9.96%**	**10.19%**
OUR	**10.70%**	**12.63%**

Source: OUR based on data from NRAs[22]

Determination 13: For fixed line carriers, the estimated nominal pre-tax WACC in US$ and J$ terms are 10.70% and 14.96%, respectively.

Determination 14: For mobile carriers, the estimated nominal pre-tax WACC in US$ and J$ terms are 12.63% and 16.95%, respectively.

[22] Please see Annex A for the sources employed for each country

Annex A: Summary of Determinations

Determination 1: The WACCs will become effective on 2021 November 28 and remain in effect for five (5) years.

Determination 2: The Office will estimate separate WACCs for fixed line and mobile telecommunications carriers in Jamaica.

Determination 3: The OUR will utilise optimal gearing to calculate the WACC for the proposed period.

Determination 4: The gearing for fixed line carriers will be 35.54% and for mobile carriers it will be 35.72%.

Determination 5: The estimated risk-free rate is 2.11% for both fixed line and mobile carriers.

Determination 6: The estimated country risk premium is 3.46**%** for both fixed line and mobile carriers.

Determination 7: The estimated debt premium is 1.59% for both fixed line and mobile carriers.

Determination 8: The estimated cost of debt is 7.16% for both fixed line and mobile carriers.

Determination 9: The beta is 0.697 for fixed line carriers and 0.918 for mobile carriers.

Determination 10: The market risk premium used in estimating the WACC will be 5.63%, for both fixed line and mobile carriers.

Determination 11: The cost of equity is 8.44% for fixed carriers and 10.45% for mobile carriers.

Determination 12: The projected inflation for Jamaica is 4.98% and the projected inflation for the USA is 1.94%. These figures will apply to both fixed line and mobile carriers.

Determination 13: For fixed line carriers, the estimated nominal pre-tax WACC in US$ and J$ terms are 10.70% and 14.96%, respectively.

Determination 14: For mobile carriers, the estimated nominal pre-tax WACC in US$ and J$ terms are 12.63% and 16.95%, respectively.

Annex B: References

NRA	Year	Country	Reference
ANACOM	2017	Portugal	Determinação da taxa de custo de capital da MEO (2017). https://www.anacom.pt/streaming/RelatorioWACC16maio2017..pdf?contentId=1413506&field=ATTACHED_FILE
MCA	2019	Malta	WEIGHTED AVERAGE COST OF CAPITAL (2019). https://www.mca.org.mt/sites/default/files/WACC%20Consultation.pdf
ictQatar	2017	Qatar	Determination of the Cost of Capital for Service Providers (2017). https://cra.gov.qa/-/media/System/0/E/E/3/0EE3AB7CD1CA5C73A6066858866F1F06/2017-12-06-Cost-of-Capital-2017---Consultation-Documents-EN.ashx
ComReg	2018	Ireland	Review of Weighted Average Cost of Capital (2018). https://www.comreg.ie/media/dlm_uploads/2019/05/ComReg-1954.pdf
PTS	2018	Sweden	Kalkylränta (WACC) för det fasta nätet (2018). https://www.pts.se/globalassets/startpage/dokument/ovrigt/kalkylmodell/2018/kalkylranta-wacc-for-det-fasta-natet.pdf
BIPT	2019	Belgium	Decision of the BIPT Council of 23 July 2019 regarding the cost of capital (WACC) for SMP operators in Belgium (2019) https://www.bipt.be/operators/publication/decision-of-the-bipt-council-of-23-july-2019-regarding-the-cost-of-capital-wacc-for-smp-operators-in-belgium
IFT	2019	México	DIARIO OFICIAL DE LA FEDERACIÓN (2019). http://www.ift.org.mx/sites/default/files/contenidogeneral/politica-regulatoria/dof-diariooficialdelafederacion.pdf
SUTEL	2018	Costa Rica	Actualización de las tasa de retorno de capital de la industria de telecomunicaciones (2018). https://sutel.go.cr/sites/default/files/audiencias/gco-tma-et-01396-2018.pdf
ENACOM	2018	Argentina	Diseño, construcción y desarrollo de modelos de costos de Servicios de TIC (2018). https://www.enacom.gob.ar/multimedia/noticias/archivos/201806/archivo_20180607072806_4532.pdf
ECTEL	2018	East Caribbean Telecommunication Authority	Cost Oriented Interconnection Rates in the ECTEL Member States (2018). https://www.ectel.int/wp-content/uploads/2018/09/PUBLIC_Determinaton_Interconnection_rates_2018-1.pdf
Bundesnetzagentur	2016	Germany	Setting the Telecom WACC (2016). https://www.bundesnetzagentur.de/SharedDocs/Downloads/EN/Areas/Telecommunications/Companies/MarketRegulation/CostOfCapital/study2016.pdf;jsessionid=E6363F3B78339638E63D404089B33AE7?__blob=publicationFile&v=2

NRA	Year	Country	Reference
GNCC	2018	Georgia	Methodology and calculation of weighted average cost of capital (2018). https://www.gncc.ge/uploads/other/3/3278.pdf

Annex C: References used in the Estimation of the Beta

In the following exhibits, we present the data from the comparable companies used in the calculation of the beta.

Exhibit 16: Comparable Fixed Network Company Betas

Fixed Network Operators	Country	Tax rate	Market Cap (Millions)	D/E	Levered Beta
Alaska Communications Systems Group	United States	27.00%	109	1.00	0.91
Consolidated Communications Holdings	United States	27.00%	497	4.75	1.12
Frontier Communications Corporation	United States	27.00%	63	8.07	1.62
Cable One	United States	27.00%	10,109	1.47	0.50
A1 Telekom Austria Group	Austria	25.00%	5,495	0.96	0.58
Tele Columbus AG	Germany	30.00%	285	4.54	1.05

Source: OUR based on data from Morningstar

Exhibit 17: Comparable Mobile Network Company Betas

Mobile Network Operators	Country	Tax rate	Market Cap (Millions)	D/E	Levered Beta
Cellcom Israel Ltd	Israel	23.00%	520	1.49	1.07
United States Cellular Corporation	United States	27.00%	2,364	0.40	0.71
Etisalat Misr	Egypt	22.50%	1,404	0.82	0.47
Forth Smart Service Public Company Limited	Thailand	20.00%	4,696	0.16	0.57
Tim Participacoes SA ADR (TSU)	Brazil	34.00%	9,314	0.09	1.01
Telecom Argentina SA ADR-TEO	Argentina	30.00%	5,104	0.26	0.97
Samart Digital Public Company Limited	Thailand	20.00%	2,392	0.72	0.84
Turkcell	Turkey	22.00%	5,006	0.76	0.67
VEON Ltd	Netherlands	25.00%	2,904	6.33	1.61
Mobile TeleSystems	Russia	20.00%	7,557	5.60	1.10

Source: OUR based on data from Morningstar