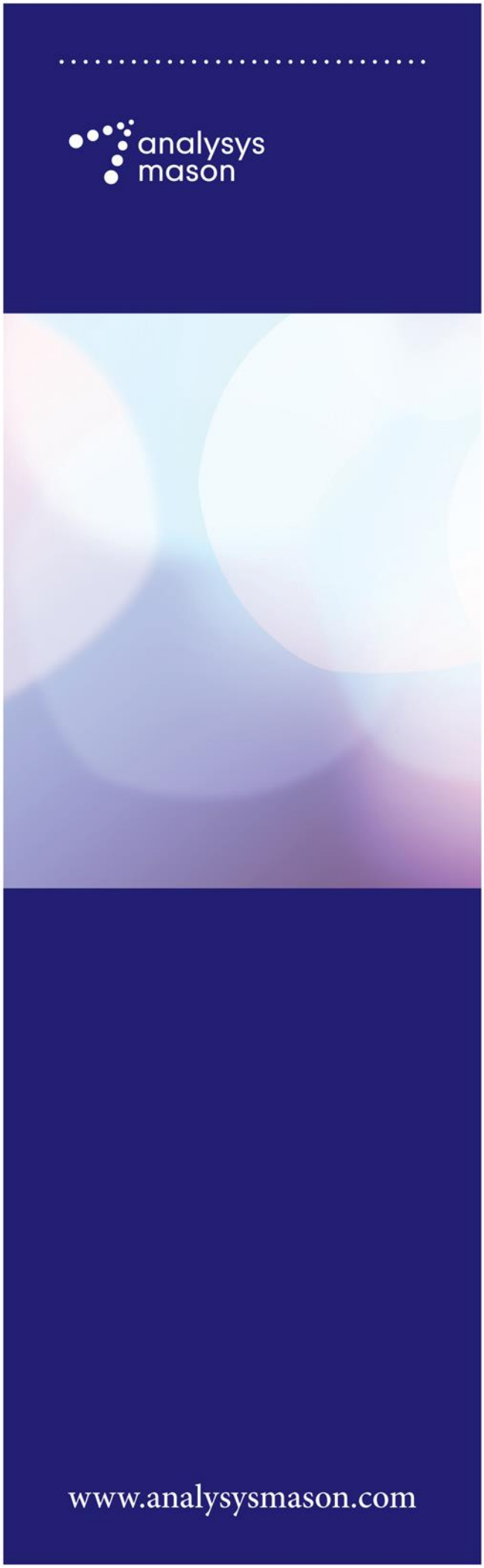

Report for Digicel Jamaica

Response to the OUR's WACC consultation

10 June 2016

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Contents

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0 Executive summary

Analysys Mason has been commissioned by Digicel Jamaica to produce an independent expert report to supplement Digicel's response to the OUR Consultation Document *Estimate of the Weighted Average Cost of Capital for Telecommunications Carriers, April 2016*. In this summary we present a brief explanation of investment returns, and focus on both the calculation of weighted average cost of capital (WACC) in emerging markets and the OUR's approach for Jamaica.

0.1 Investment returns

The cost of capital represents the rate of return a company should earn on its invested capital in order to provide sufficient returns to the investors who are financing the business. This return compensates the investors on the basis that they could earn a return elsewhere, from other projects with a similar risk profile. The cost of capital compensates the investors for the risk they are taking – corporate investments are not risk-free, and there is no guarantee of achieving the specified return (the actual return could be higher or lower), even though the business plan may suggest that a specific hurdle rate of return can be achieved.

From a regulatory perspective, services that are subject to cost-oriented price controls should allow a reasonable or fair rate of return within the prices. The cost of capital calculation is the most appropriate method of defining this reasonable rate of return, and is typically calculated as a WACC, taking into account proportions of debt and equity costs. The capital asset pricing method (CAPM) is commonly used to define the cost of equity invested in the assets of a business.

Underpinning the WACC calculation is the assumption of a risk-free rate of return. This risk-free rate is typically obtained from a reliable government's long-term bond, and when expressed in current prices (nominal terms) it includes an inflation expectation over the period of the bond. An investor is therefore taking some risk on expected inflation as well as some risk on the bond itself, unless the bond is inflation protected.[1] If the investments are undertaken in a developed country, it is commonly accepted that there are no major country-specific risks. However, emerging markets present a variety of country-specific risks to an investor, including weak socio-economic factors, natural disaster risks and varying degrees of institutional confidence.

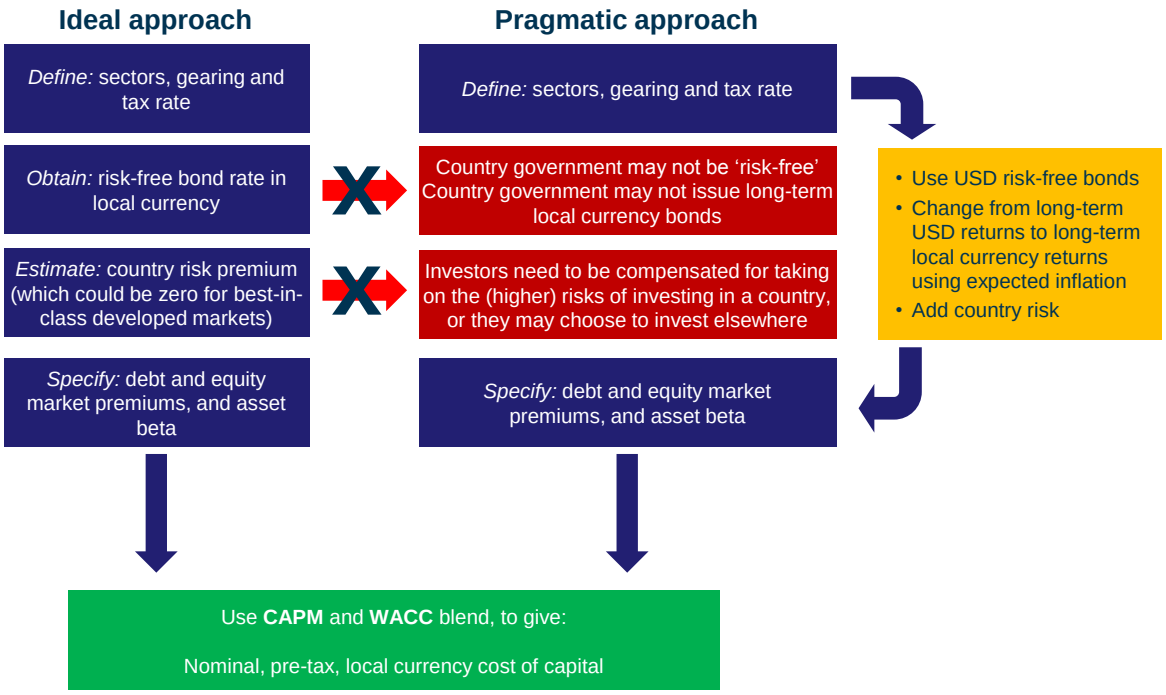
0.2 WACC principles applied to emerging markets

All the various WACC and CAPM parameters need to be obtained or estimated: this applies to any market, whether developed or emerging.

In emerging markets, however, depending on the availability of data and the specifics of the country, two approaches to calculating the WACC are possible (shown in Figure 0.1).

[1] Inflation-protected bonds are uncommon (the US Treasury issues real-terms bonds). Emerging markets are highly unlikely to issue inflation-protected bonds, because of the uncertain prospects of volatile and high inflation.

Figure 0.1: The two approaches to calculating the WACC [Source: Analysys Mason, 2016]



The *ideal approach* assumes availability of reliable, local market data and reaches the cost of capital result based on direct use of the parameters, similar to the approach that would be used in a developed market.

The *pragmatic approach* recognises the drawbacks arising in the case of Jamaica and many other emerging markets:

- the government's bonds may not be considered risk-free (AAA or similar rating, or there may be other concerns from recent financial assessments)
- long-term bonds may not be available in the currency employed in the business, potentially due to high or uncertain long-term inflation expectations which need to be factored into the nominal bond rate offered by the issuer
- the emerging market may have country-specific factors which increase the risk faced by investors.

As the OUR has recognised, these drawbacks are avoided where available data (e.g. from foreign developed markets) is used as the underlying capital-cost factors, and adjustments are made to account for the differences between the foreign developed market and the target emerging market; Jamaica in this instance. Standard methods for estimating the cost of debt and equity are also difficult to apply when there is a thin, illiquid stock market.[2] The OUR has avoided these pitfalls by reverting to benchmarks from other countries.

[2] Roache, S.K., 2006. *Domestic Investment and the Cost of Capital in the Caribbean* (EPub) (No. 6-152), International Monetary Fund.

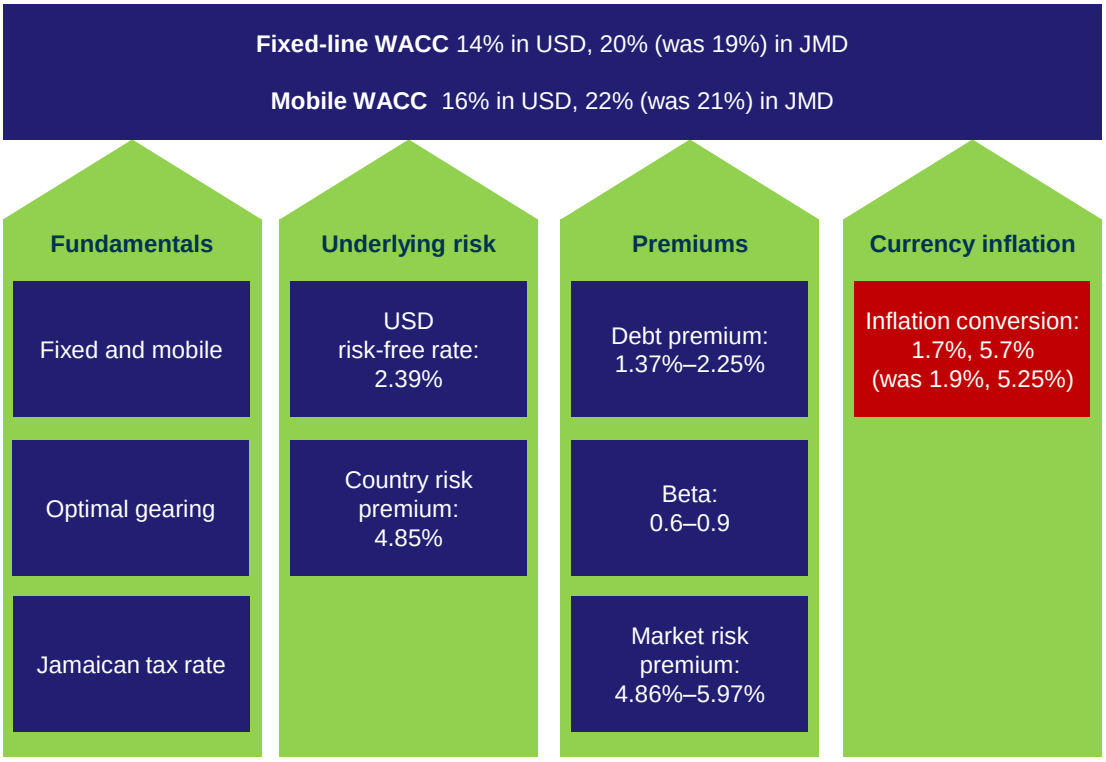
In Jamaica there are no local government bonds issued in Jamaican Dollars (JMD) that could be considered as risk-free, so this pragmatic approach to assessing the cost of capital for a Jamaican investment is required. Trying to estimate a local currency discount rate is recognised as a possible solution to the lack of reliable local JMD bond rates.[3]

This approach of using USD risk-free bonds, changing from the long-term USD environment to the long-term local currency environment using inflation expectations, and adding a country-specific risk premium is reasonably applicable to all emerging markets, across the Caribbean and beyond.

0.3 The OUR's WACC for Jamaica

We consider that the approach used by the OUR to reach the WACC calculation is reasonable, and reflects the relevant factors needed to obtain the USD and local-currency cost of capital required for an international investor such as Digicel in Jamaica's fixed and mobile telecoms sectors. We suggest an amendment to the inflation parameters assumed within the JMD cost of capital, based on a long-term projected inflation rather than point estimates. This results in a slightly different WACC value, indicated in Figure 0.2.

Figure 0.2: Summary of WACC recommendation [Source: Analysys Mason, 2016]



[3] Damodaran, A., 2008. *What is the riskfree rate? A Search for the Basic Building Block* (14 December 2008).

1 Introduction

Analysys Mason has been commissioned by Digicel Jamaica (Digicel) to produce an independent expert report to supplement Digicel's response to the OUR Consultation Document[4] *Estimate of the Weighted Average Cost of Capital for Telecommunications Carriers, April 2016*. The main objective of the report is to comment on the approach taken by the OUR and to assess it against economic and investment principles, and best practice, taking into account:

- costs of capital for investing in emerging markets
- transparent principles for international versus in-country returns
- specifics of small emerging markets with limited financial indicators and capital liquidity
- relevant parameters for debt, equity and country risks
- high local inflation.

The OUR Consultation Document sets out a sequence of steps to arrive at the cost of capital to be applied in Jamaica, and raises eight questions to stakeholders. As part of our review, we have provided our opinion on these questions, and included three other aspects not questioned by the OUR (specifically, overall approach, tax rate and country risk premium).

The remainder of this report provides our review and opinion on the OUR's approach.

[4] See http://www.our.org.jm/ourweb/sites/default/files/documents/sector_documents/estimate_of_the_weighted_average_cost_of_capital_for_telecommunications_carriers.pdf.

2 The OUR's cost of capital for telecoms carriers in Jamaica

The OUR's Consultation Document sets out a number of steps to reach the cost of capital for Jamaican fixed and mobile market investments expressed in local Jamaican Dollars (JMD) in nominal terms (current prices). In this section we assess the approach taken by the OUR, looking in turn at:

- general approach and basic parameters
- underlying cost rate of risk in Jamaica
- premiums on debt and equity
- converting to local currency
- final results and additional adjustments.

2.1 General approach and basic parameters

There is a general consensus among operators and regulators worldwide that the cost of capital should be estimated as the weighted average cost of capital (WACC). The WACC is the return that each financial investor would require from the capital contributed to a company. A company will typically have two major classes of investor: equity holders and debt holders. Debt holders have priority in their claims over the after-tax cashflows that a company generates and, therefore, bear less risk. Hence, they will also require a lower return than equity holders.

WACC is calculated as follows:

$$WACC = C_d \times \frac{D}{D+E} + C_e \times \frac{E}{D+E}$$

Where:

C_d is the cost of debt (including the tax shield effect of debt)

C_e is the pre-tax cost of equity, often evaluated with the capital asset pricing method (CAPM)

D is the value of the operator's debt

E is the value of the operator's equity.

When calculating the WACC, the following methodological issues should be taken in consideration.

Price base

WACC may be measured either in real terms or nominal terms. A nominal WACC is expressed in current terms, while a real WACC is expressed in real, constant prices. Hence, the real WACC shows the WACC excluding the impact of inflation. The choice of price base should be consistent with the regulatory pricing regime.

A transparent approach to the price base is particularly important in high-inflation economies because this will increase the nominal rate of return

required. The opportunity cost of employing capital must compensate for the inflationary effect of the local currency, otherwise there is less incentive to invest in local currency projects due to the devaluing effects of high inflation.

Taxation

The WACC may be estimated post-tax or pre-tax. The pre-tax WACC is the WACC adjusted to allow for corporate tax payments. When applied to the capital base, it indicates the (pre-tax) operating profit required to finance tax and interest payments, while providing shareholders with their required return. The WACC is usually calculated on a post-tax basis, and then converted to a pre-tax WACC. A formula often used for converting a post-tax WACC to a pre-tax WACC is:

$$WACC_{Pre-Tax} = \frac{WACC_{Post-Tax}}{(1-T)}$$

Where T is the effective tax rate.

Comments on the overall approach *(a question not asked by the OUR)*

The OUR follows best practice in using the WACC and CAPM approaches. In addition, the Consultation Document uses a transparent and country-specific approach to define the WACC and CAPM parameters. Finally, the OUR's approach offers regulatory consistency by using the same methodology as in 2010 and 2011. We consider that it is also good practice for the OUR to set expectations that the WACC estimate should be updated regularly, for example every five years.

The OUR calculates a separate WACC for the fixed and mobile sections of the industry, based on difference in risk between the two sectors.

Q1: Do you agree with the approach to estimate separate WACCs for fixed line and mobile?

The use of a separate WACC for the fixed and mobile sections of the industry is best practice. It is possible for the two sectors to converge over time, especially in the context of fixed–mobile convergence (FMC) and with the emergence of operators that are both fixed and mobile players. However, convergence is not complete in Jamaica, because there are still major differences in segmentation between fixed-line and mobile users at present, and therefore the OUR is right to estimate separate WACCs for the fixed and mobile sections of the industry.

The weighting used in the WACC formula is the company's gearing. It is necessary to define an efficient funding structure for the company, based upon an estimate of the (optimal) proportion of debt and equity in the business. The gearing denotes loan capital as a proportion of the total financing needs of a company, and is expressed as:

$$Gearing = D/(D+E)$$

Generally, the demand for return on equity will be higher than the demand for return on debt. An increasing gearing will, however, lead to an increasing cost of debt, as creditors demand a higher interest rate if there is less certainty that the debt will be repaid. Therefore, in financial theory it is assumed that an optimal financing structure, which minimises the cost of capital, actually exists. This is called target gearing. In practice, this optimal gearing is very difficult to determine and will vary according to the type and form of the company. There are three possible methods which can be used to estimate gearing:

- using book values
- using market values
- using an optimal or efficient gearing.

The OUR approach uses an optimal gearing based on the average market value gearing of telecoms companies in emerging markets. While using market values would have been a possibility, the OUR explains its preference for optimal gearing based on the lack of robust data on debt and equity values for the operators in Jamaica (Digicel and C&WJ) as well as the preference for using optimal values to avoid bias from any inefficiency in the market. Market inefficiencies will arise in the case of Jamaica where local inflation is relatively high – the uncertainty in inflation is larger than the *total* risk which typical bond holders would take in developed markets. This means that 'low cost' debt funding in Jamaica would be accompanied by stricter debt covenants or simply not attractive to debt holders, as the combination of local currency (inflation) risk and country risk exceeds the typical risk appetite of debt owners. This emphasises the reliance of companies on equity funding which have fewer restrictions for riskier emerging market investments.

We note that the OUR's assumption of a relatively low proportion of debt funding in Jamaica is consistent with information summarised by Roache[5] (Figure 5).

Q2: Do you agree with the use of an optimal gearing approach and the ranges specified?

Establishing robust debt and equity values is fraught with problems. Therefore, using a target gearing is transparent, and the use of benchmarks will reflect the typical funding structures assumed for efficient companies elsewhere. A larger mix of equity assumed by the OUR target gearing is consistent with more limited debt borrowing opportunities in developing markets.

The OUR approach includes the effect of taxation both in terms of the tax shield effect of debt (i.e. the fact that corporate taxes are calculated after payment of interests) and in terms of allowing the company to pay tax and still meet its expected return. Both represent best practice.

Comments on tax rate *(a question not asked by the OUR)*

5 Roache, S.K., 2006, *Domestic Investment and the Cost of Capital in the Caribbean* (EPub) (No. 6-152), International Monetary Fund.

The tax rate used in the calculation is the official tax rate in Jamaica rather than the effective tax rate paid by telecoms companies. This can be seen as a conservative assumption, although it is not necessarily wrong, as when assessing investments an investor would need to allow for the probability that the official tax rate would apply.

2.2 The underlying cost rate of risk in Jamaica

The opportunity cost of investing capital in a business represents the returns which could be earned elsewhere, from an investment involving similar risk. The time value of money in earning this return means that for the duration that capital is tied up in a business, it must earn the rate of return. The risk-free rate represents the return that an investor requires from an absolutely risk-free investment. In current prices, the risk-free time value of money is just the inflation experienced by the currency, as in order for the capital to maintain its value it must at least grow with inflation in the country.

Although, in principle, no such risk-free investment exists, in practice, the risk-free rate can be approximated by examining the yield-to-maturity (YTM) rate of liquid government bonds, assuming that the government in question has no default risk associated with its bonds. Government bonds therefore typically reflect, in nominal terms, the relevant currency inflation expectations and the (small) premium over inflation to attract investors to the 'risk-free' government bond market.6

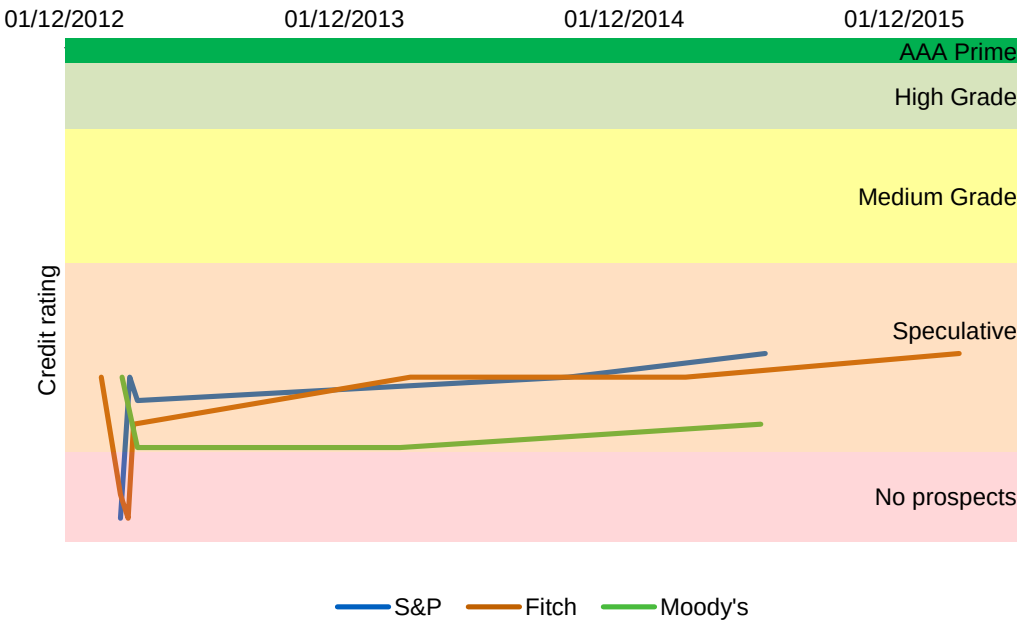
When defining the risk-free rate, it is necessary to consider:

- what reference point to choose (i.e. which governments)
- what maturity period (i.e. the investment horizon, the planning horizon or the regulatory review period), and
- what kind of information to use (current or historical, averaging period).

The OUR correctly states that Jamaican government bonds are not considered risk free, with rating agencies classifying Jamaica as *speculative* for credit worthiness (see Figure 2.1). The Jamaican government also does not appear to make regular bond offers, and does not issue them in local currency. This makes it challenging to robustly determine a local currency, local risk-free rate.

6 The US Treasury also issues inflation-protected securities (TIPS) which are indexed to inflation, and therefore only show a real yield (around 0.2% to 0.3% for 10-year securities). Source: Daily Treasury Yield Curve Rates, www.treasury.gov.

Figure 2.1: Credit rating for Jamaican government [Source: Trading Economics, 2016]

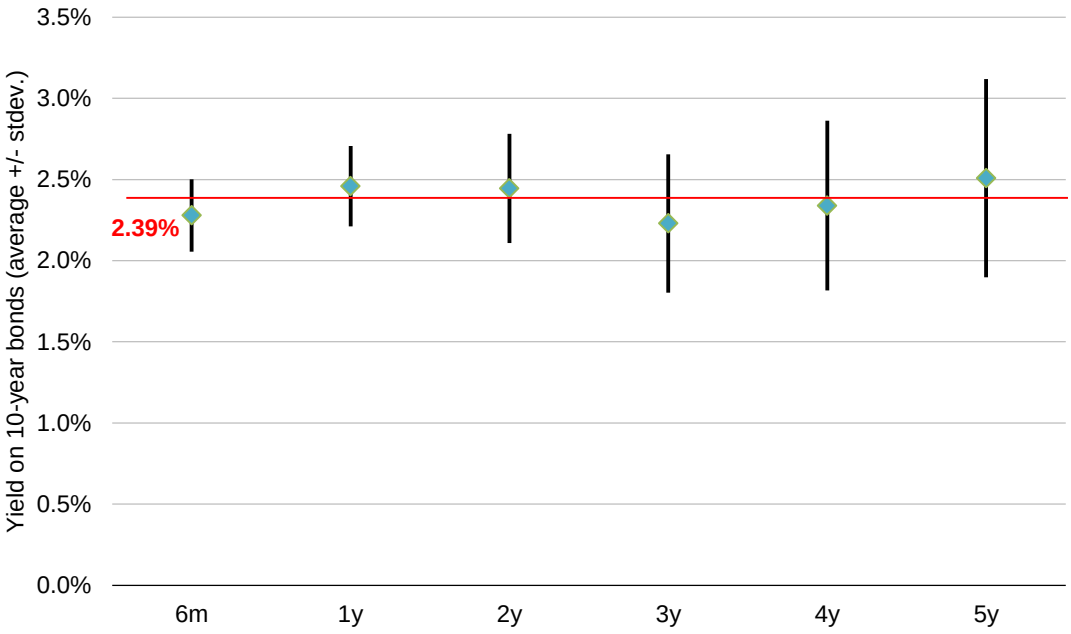


In order to identify a bond rate which can be considered largely free of risk, it is therefore necessary to refer to a country that is rated *prime* or *high grade*. The USA or major European governments are typically selected.

The investment horizon for telecoms networks is significantly longer than the typical regulatory review period of 3 to 5 years. Investment lifetime in duct, fibre transmission and mobile infrastructure is generally accepted to be at least 10 but potentially 20+ years. Therefore, as highlighted by the OUR, the use of a 10-year bond rate is commonly accepted and reflects the time period over which most infrastructure operators develop their long-term business investment plans and plan their capital investments.

Given that recent inflation rates have been strongly affected by large reductions in oil prices, adopting spot bond rates for the present time can be considered less reliable than taking an average over a recent period of relatively stable rates. The OUR chooses a five-year historical period and calculates a risk-free rate, thus avoiding the peak of the 2008–2009 'credit crunch'. While a five-year period is longer than the benchmarks presented by the OUR in Table 3 of the Consultation Document, the risk-free rate adopted by the OUR remains within the 95% confidence interval of the average rate, irrespective of whether the average is taken over a shorter period than five years (see Figure 2.2).

Figure 2.2: Simple historical period average and confidence interval (standard deviation) of ten-year US bond yield [Source: Federal Reserve data set, referenced in Figure 1 of the OUR's Consultation Document, 2016]



Q3: Do you agree with the approach to estimating the risk-free rate? Please give reasons for your response where changes to the approach are being proposed.

Using a US government bond is the best proxy for a risk-free rate. A ten-year bond yield is consistent with the minimum-duration investments undertaken by telecoms infrastructure operators. Using a multi-year average of past rates is a more reliable estimate of stable bond rates than spot values obtained today in a period of unusually low inflation, and past averages over the past five years can be seen to be reasonably stable.

The proposed 2.39% USD risk-free rate appears reasonable.

The underlying rate of risk in Jamaica is expressed by the OUR as the combination of the risk-free rate and the country risk premium (CRP), with the OUR noting that CRPs are not always included.

The relevance of inclusion of a CRP can be explored in four ways:

Developed-market benchmarks do not refer to CRP

Many WACC calculation benchmarks for telecoms services have been prepared in developed markets such as across the EU. In those situations the country risk premium of an emerging market is not relevant, and so is not discussed. The OUR has correctly identified the need for a Jamaica-specific emerging-market country risk premium.

The CRP might already be included in the government

As discussed above, a government bond may be considered risk-free or may be rated as less than high grade, implying that a return premium is needed to compensate for the riskiness of the bond.

bond rate

Where WACC calculations can be based on reliable local government bond information for the 'risk-free' rate then the issue of a country risk premium should not arise, irrespective of the rating agency's opinion on investment risk. This is because any country stability or country risk will be implicitly accounted for within the government bond rate.

We can find evidence[7] of three recent USD bond issues by the Jamaican government:

- 30-year bonds with a 7.875% rate, in July 2015
- 12-year bonds with a 6.75% rate, in July 2015
- 10-year bonds with a 7.525% rate, in July 2014.

Because these bonds were issued in USD, they reflect underlying USD inflation over the projected period, but also include a premium for the Jamaican government's *speculative* credit-risk rating for repayment of the bond. Taking a simple assumption of 2% long-term USD inflation implies a country risk premium of over 5%. This supports the OUR's selected CRP of 4.85% for Jamaica.

CRP might already be included in other risk premiums

Where parameters may be calculated from market data in an individual country, it is possible that country risk is implicitly already accommodated. Difference in country risk was listed[8] by the Independent Regulators Group (IRG) as a factor within the equity risk premium (see Figure 2.3). The figure shows the three highest equity risk premiums in the sample (Romania, Greece and Lithuania) and highlights that "[...] *there are significant differences among IRG countries* [...] *can be caused by different calculation methods, but also country specific reasons (maturity of stock markets, differences in country risk, etc.)*". When compared with European central bank bonds, the Romanian equity risk premium will include any Romanian country risk above the risk-free Eurobond.

7 See CbondS, http://cbonds.com/countries/Jamaica-bond.

8 IRG, section 4.3.4, *Principles of Implementation and Best Practice for WACC calculation*, February 2007.

The figure below shows the level of the equity risk premium in some IRG member states. The average value is 5,3 %. As can be seen from the graph, there are significant differences among IRG countries. These differences can be caused by different calculation methods, but also by country specific reasons (maturity of stock markets, differences in country risk, etc.)

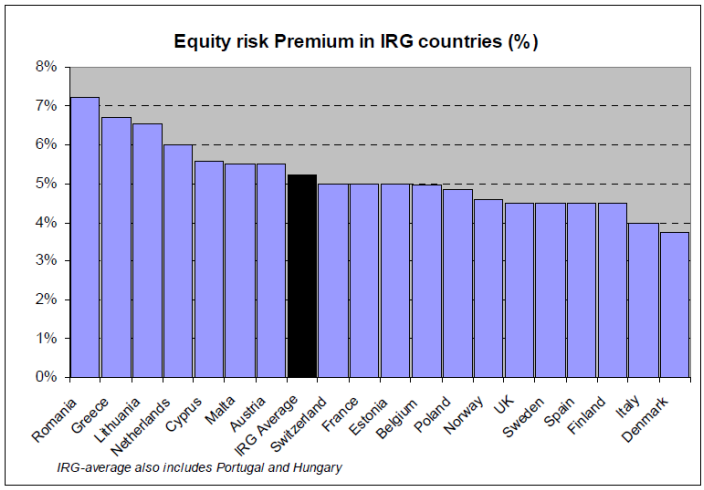


Figure 2.3: Extract from section 4.3.4 of IRG paper on WACC [Source: IRG Regulatory Accounting Data, 2007]

International investors could consider CRP differently from national investors

International investors have a choice of investing globally. A country risk premium is therefore needed if a country with a high level of in-country risk is to attract investment.

For illustration, consider an investor looking at alternative projects (in the same industry such that they have similar asset profiles). If the investor can expect to earn a 12% annual return on a US investment, and is offered the same return of 12% on an emerging-market investment, then the investor will choose the US investment. This is because the higher risks associated with emerging markets (e.g. due to weaker institutions, poorer socio-economic fundamentals, natural disaster risks, etc.) are uncompensated in the 12% return. In order to compete for the investment on an equal footing, the emerging-market project must offer a higher return, to compensate the higher in-country risks of choosing the investment. This example can be related to the *Lucas Paradox* (the lack of capital flow from rich to poor countries in order to exploit greater marginal productivity of capital). Capital flows into Jamaica which support income equalisation should therefore be encouraged, in order to support the development of human capital and overcome capital-market imperfections which reduce the desire to invest in emerging markets.[9]

[9] This is further explored in Alfaro et al, *Why Doesn't capital flow from rich to poor countries? An empirical investigation* (2005), which concludes that "*Policies aimed at strengthening the protection of property rights, reducing corruption, and increasing government stability, bureaucratic quality, and law and order should be a priority for policy makers seeking to increase capital inflows*".

> This is also recognised by Roache: "*addressing structural issues in the financial sector could allow the cost of capital to decline*."[10]
>
> Conversely, a national investor, such as a state-owned company investing in its home market, may not need to be compensated for the in-country risk premium. This is because its investments are not geographically fungible: a state-owned company will be directed by the government to invest locally, and it would not consider investment options in other countries to be comparable. Therefore, special circumstances may arise where the rate of return required by the government investor does not need to compete with other (lower-risk) international projects. However, international investors cannot be directed/instructed by government officials to undertake investment in Jamaica.

According to the OECD, Jamaica is classified as 7 on a scale of 0 to 7 of country risk for the Arrangement on Officially Supported Export Credits.[11] Other analysts mention a number of risk factors for Jamaica including economic risks, low growth and liquidity risks.[12]

Professor Damodaran is a common source for global cost of capital parameters. According to his estimates using credit ratings, the long-term local-currency equity country risk *premium* for Jamaica is 13.42% compared to 0% for the US, UK and other risk-free countries. Using Professor Damodaran's alternative method of a premium based on credit default swaps (CDS), the Jamaican local currency country risk premium could be around 2% lower (see Figure 2.4)[13] than 13.42%. Professor Damodaran's figures quoted here include relative inflation expectations for local currency compared to the USD, GBP or Euro. Using the IMF's relative long-term inflation differential (see Figure 2.7) for JMD compared to the USD of 4% leads to a potential CRP for Jamaica in excess of 7%.

10 Roache, S.K., 2006, *Domestic Investment and the Cost of Capital in the Caribbean* (EPub) (No. 6-152), International Monetary Fund.

11 Source: OECD, http://www.oecd.org/trade/xcred/crc.htm.

12 *Jamaica: Summary Bond Terms*, VMWM Research Department, 27 March 2013.

13 The highest risk country based on CDS is Pakistan (7.44% CRP) which has a ratings-based country risk of 9.70%, hence around 2% lower CRP when based on CDS (see Figure 2.5)

Figure 2.4: Ratings based local currency credit risk premium [Source: Damodaran Online, 2016]

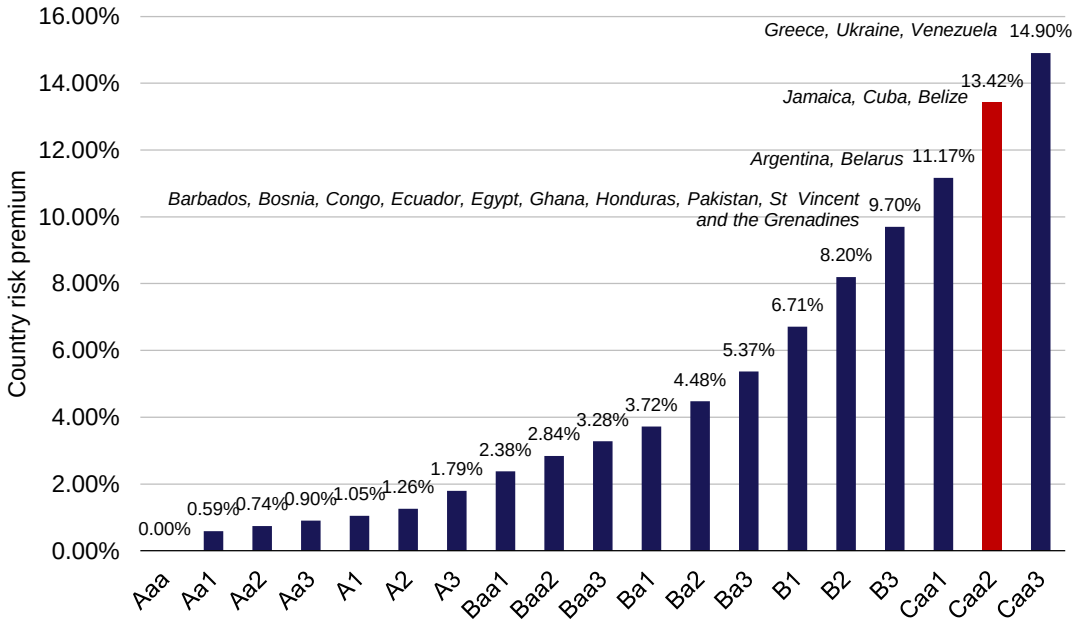
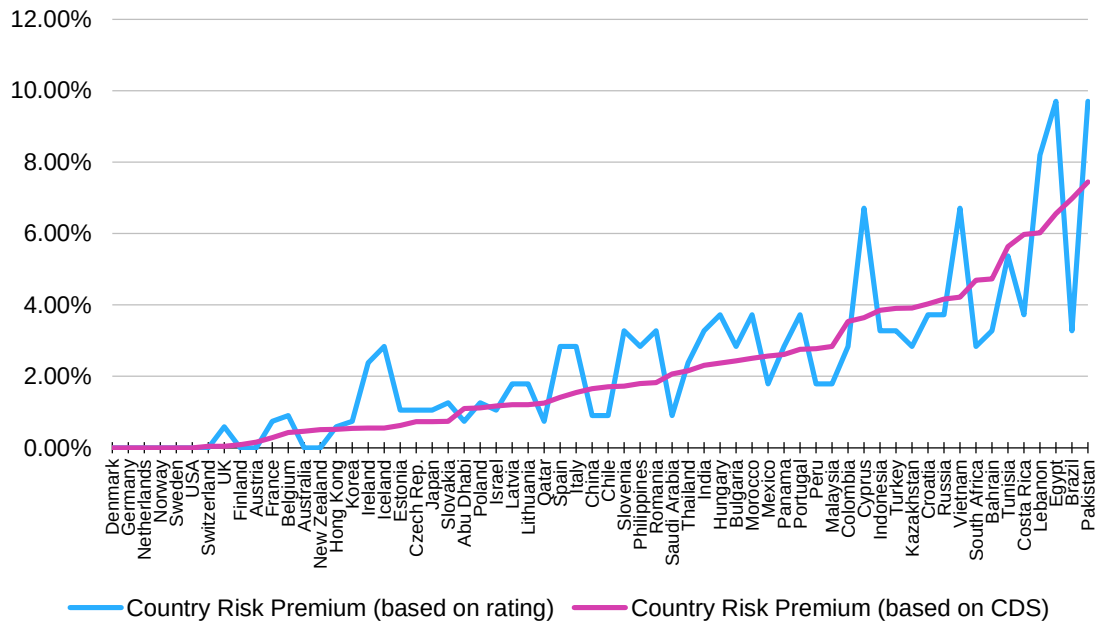


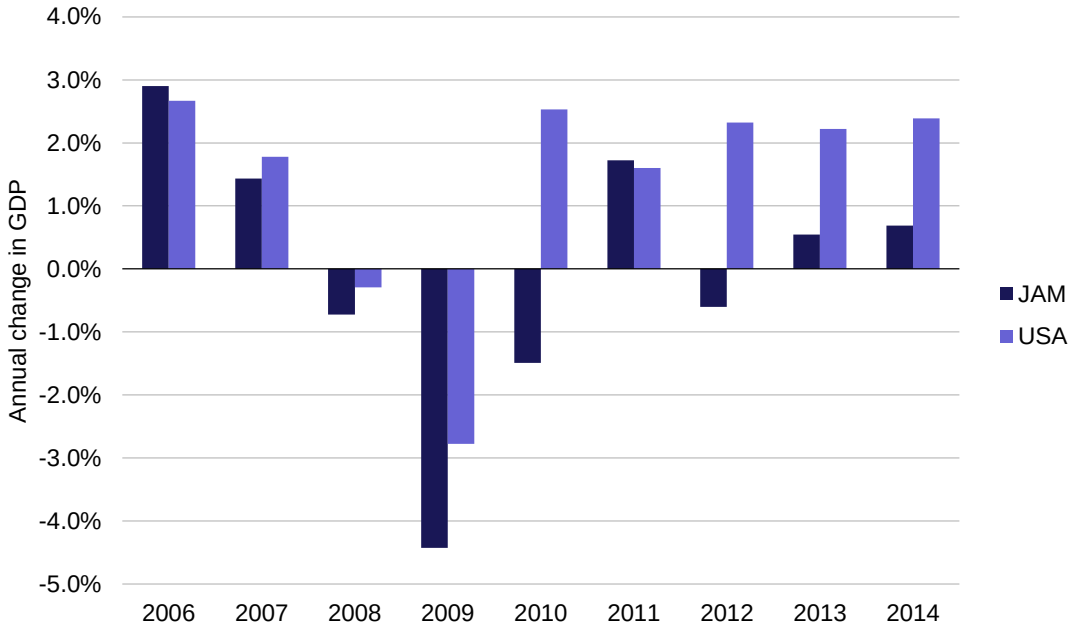
Figure 2.5: Local currency credit risk premium comparing rating agency and CDS methods [Source: Damodaran Online, 2016]



The relative risk of the Jamaican economy is highlighted by a headline comparison of its economic performance in the last decade. In the recent global recession, the US suffered a two-year contraction of around 3% in GDP, while Jamaica suffered a three-year contraction of nearly 7% in GDP. Since the recession, Jamaica has experienced weak and volatile growth (Figure 2.6). The

small size of the Jamaican economy magnifies its susceptibility to external shocks from international commodity, tourism, trade and industrial trends.

Figure 2.6: GDP growth rates [Source: The World Bank World Development Indicators, 2016]



Given the international breadth of telecoms industry investments, there are implied limitations on investor selection if the emerging-market cost of capital is set to exclude the prevailing country risk premium. Investment spending is particularly sensitive to risk when the investments are irreversible and could be delayed.[14] Not including a country risk premium does not remove its existence, hence this premium must be either:

- paid by service users to the investor
- subsidised in some way by the government, or
- absorbed willingly by the investor.

The method adopted by the OUR to use a US risk-free rate and include a Jamaican CRP transparently separates the issue of *risk-free returns* and an allowable *country risk*, and therefore does not suffer from inappropriate benchmarking with developed nations nor exclusion of this relevant factor in the returns required for unfettered international investors.

[14] Pindyck, R.S., 1990, *Irreversibility, uncertainty, and investment* (No. w3307), National Bureau of Economic Research.

Comments on country risk premium *(a question not asked by the OUR)*

The inclusion of a country risk premium in the underlying rate of risk for Jamaica appears reasonable and is consistent with the intention to compensate international investors for the higher risk of investing capital in Jamaica compared to other more developed markets. There is significant country risk associated with Jamaica, as evidenced by both the OUR's bond yield spread and the simple bond-rate comparison we have presented above, as well as climatic and socio-economic hazards. Estimates of country risk premium from Professor Damodaran suggest a higher figure than selected by the OUR. The IMF has been engaged in supporting the Jamaican authorities, and recently commented on the progress made and the further actions required to improve and transfer responsibility for financial stability to the Jamaican central bank[15].

The proposed country risk premium of 4.85% for Jamaica appears reasonable.

2.3 Premiums on debt and equity

The cost of debt reflects the cost a company has to sustain in order to obtain debt capital to finance its activity, either from financial institutions, through loans from other companies or sometimes through bonds issued to the public. It corresponds to the weighted average of the costs of the various long-run loans of the company, and it is strongly correlated to the current interest rate levels, the company's financial capacity and risk, and even to the country's fiscal policy. The cost of debt is calculated as follows:

$$C_d = (1-T) \times R_D$$

Where:
R_D is the company's cost of debt
T is the corporate tax rate.

In principle there are three methods for calculating the appropriate cost of debt:

- using accounting data such as the current loan book
- calculating an efficient borrowing level and the associated cost of debt based on credit ratings
- using the sum of the risk-free rate and the appropriate company-specific debt premium, which can be estimated by benchmarking comparable companies' prevailing yields on debt securities (corporate bonds) with similar risk or maturity.

The OUR approach is to calculate a debt premium and add it to the risk-free rate. The value of the debt premium is based on a benchmark from recent regulatory decisions, due to the absence of reliable data on cost of debt for local telecoms carriers in Jamaica. The final values used by the OUR are towards the higher end of the benchmark, which is a conservative assumption.

[15] IMF mission statement on the 2013 Extended Fund Facility. https://www.imf.org/external/np/ms/2016/052016.htm

Q4: Do you agree with the estimate of the debt premium? Please be detailed in your response providing data to support your calculation where a different approach/value is being recommended.

The use of benchmarked values is consistent with the use of an optimal gearing value, as the cost of debt is related to the gearing. The conservative assumption taken by the OUR in giving more weight to values at the top of the benchmark is in our opinion justified by the fact that the countries in the benchmark are either developed or developing GCC countries with a mostly oil-based economy (i.e. very different from the situation in Jamaica). It would be ideal to use debt premiums derived from countries more comparable to Jamaica, but we accept that the lack of data makes that difficult at the moment.

The cost of equity can be calculated using a variety of methods, the most common one being the capital asset pricing method (CAPM). The IRG has acknowledged in one of its principles of implementation and best practice that use of the CAPM is beneficial due to its relatively simple implementation and the fact it is widely used among regulators and practitioners.

According to the CAPM, the required return on equity is estimated as follows:

$$C_e = R_f + \beta \times R_e$$

Where:
R_f is risk-free rate of return
R_e is the equity risk premium which is in turn defined as $R_m - R_f$ where R_m is the market equity rate of return
β is the equity (or levered) beta.

Different types of stock have different risk profiles. In the CAPM this is referred to as *beta*. Beta is measured as the covariance between the return of the specific stock and the return of the market portfolio. It is a measure of the exposure of a specific risk to systematic, or non-diversifiable, risks. Everyone who invests in a market is exposed to such systematic risk, but some stocks are more exposed than others.

It is typically recommended that a company's beta should be estimated through either: historical information about the relationship between the company returns and the market returns, by benchmarking estimates of the beta for comparable companies (which will in turn be based on historical comparisons of company and market returns), or through the definition of a target beta, depending on market conditions and available information.

The OUR approach uses a benchmark of betas calculated from comparable companies in the USA, Europe and Asia. The calculation then adjusts the betas to the optimal gearing chosen by the OUR (re-levering) and applies the Blume adjustment (tending the betas towards 1). The final values used by the OUR are towards the higher end of the benchmark, which is a conservative assumption.

Q5: Do you agree with the approach to estimating beta? Please provide a detailed response where changes to the approach are being proposed.

The use of benchmarked values is consistent with the lack of available data. The conservative assumption taken by the OUR in giving more weight to values at the top of the benchmark is in our opinion justified by the fact that operators in the benchmark are mostly based in developed countries (i.e. very different from the situation in Jamaica). It would be ideal to use betas from operators more comparable to the telecoms carriers in Jamaica, but we accept that the lack of data makes that difficult at the moment. As other countries' fixed, mobile and TV sectors converge it will become increasingly difficult to obtain disaggregated asset betas, and multi-play companies in developed markets will benefit from diluted asset risks. Therefore, benchmarking beta should be done carefully to ensure asset risk profiles comparable to those in the relatively less mature Caribbean region.

Application of the Blume adjustment is common but not universal. It reflects the assumption that telecoms services are becoming generally correlated with overall economic performance, rather than being a specifically high- or low-risk industry. The range of betas proposed by the OUR, from 0.6 to 0.9 depending on the case, reflect slightly lower volatility than the stock market average (beta of 1.0).

Market or equity risk premium (MRP or ERP) is the increase over the risk-free rate of return that investors demand from equity in general. As it is riskier to invest in stocks (equity) than to invest in risk-free government bonds, investors demand a risk premium when investing in stocks. Usually, companies listed on the national stock exchange used as the sample over which this average is calculated. As with the risk-free rate, this parameter is not related to the product market that is being assessed.

To calculate this parameter, we recommend a balanced approach which considers the relevance and quality of available information, using one or more of the following methods:

- (adjusted) historical premium
- survey premium
- benchmarking or implied premium (ex-ante approaches based on, for example, the dividend growth model).

The OUR approach uses historical data on equity risk premiums to calculate the range values. The Consultation Document does not indicate clearly for which markets the historical data has been collected.

Q6: Do you agree with the approach to estimating the MRP? Please provide a detailed response where changes to the approach are being proposed.

The use of historical data for estimating the MRP is reasonable. The values calculated are well within the range of recent regulatory decisions. It would be more transparent if the OUR explained more clearly what data source it has used.

2.4 Converting from USD to local currency

Operations in Jamaica are carried out in local currency, and the revenue earned by Digicel and the other operators is accrued in local currency in order to cover expenses, repay investment and return the opportunity costs of employed capital. The OUR also sets regulated prices in JMD. It is a given that investors' returns should allow for inflation, and expectations of inflation can be included in the nominal WACC calculation.[16]

This means that prices and cost of capital employed in the utilised assets (expressed in JMD) need to reflect the long-term currency expectations for the JMD. Up to Chapter 5 in its Consultation Document, the OUR has proceeded on the basis of USD rates, founded upon the underlying USD risk-free rate. If the Jamaican government was to issue long-term (risk-free) bonds in JMD, then the bond rate would include the long-term inflation expectations for Jamaica. This would ensure that the opportunity cost of purchasing the JMD bond covered both the currency inflation and the (risk-free) bond risk. This is analogous to the US government offering both nominal and inflation-protected bonds, differing in principle only by the inflation expectation. It would be incorrect to convert from a JMD cost base to a USD cost base using an exchange-rate conversion, as the nominal discounting rates of return include in-built long-term inflation expectations. The OUR correctly avoids this issue by converting the discount rate from USD to JMD terms using expected inflation and Equation 6 in the Consultation Document.[17]

IMF data for projected inflation over the period 2015–2021 results in slightly different inflation figures from the point values that the OUR presents in the Consultation Document (see Figure 2.7).

Figure 2.7: Inflation projections [Source: IMF World Economic Outlook Database, 2016]

Year	Inflation, US	Inflation, Jamaica
2015	0.1%	4.7%
2016	0.8%	4.2%
2017	1.5%	5.9%
2018	2.4%	6.6%
2019	2.5%	6.6%
2020	2.3%	6.4%
2021	2.2%	5.9%
Average	**1.7%**	**5.7%**

16 Oxera, 2005, *Which WACC when? A cost of capital puzzle*.

17 The mismatch between operational currency and valuation (discounting) currency is explored in depth in Damodaran, 2008.

Q7: Do you agree with the values to be used for expected inflation for Jamaica and the United States of America?

In order to convert from USD to a local currency WACC, an inflation conversion is needed. The use of a projected average inflation over the coming years is the relevant indicator, as it matches the time period over which the WACC will be used and the investment returns are being considered.

Based on IMF projections, we recommend expected inflation of 1.7% for the USA and 5.7% for Jamaica for the relevant period.

2.5 Final results and additional adjustments

Regulators sometimes apply specific adjustments for factors not already covered by the standard WACC or CAPM calculation. These could include factors which specifically affect small markets, such as:

- including a small company risk premium
- recognising the cost of financing in the cost of debt (i.e. borrowing costs)
- sophisticated tax adjustment to reflected the effect of the actual tax regime or investment incentives for foreign companies
- the impact of macroeconomic issues on local debt markets (such as pension funds holding locally denominated debts as a fiscal requirement, distorting the observed debt premiums).

These adjustment are country-specific, not always implemented and need to be based on evidence.

The OUR does not apply any such specific adjustments explicitly, but we consider that the use of maximum figures across all carriers and the use of point estimates closer to the top of the ranges presented means that small carriers will not be adversely affected by their small scale. This choice of the OUR mimics the effect of a 'small company premium'.[18]

One could argue that the use of maximum values may lead to larger carriers benefiting from a cost of capital that is too high. On this point, however, Ofcom in the UK took the view that the downside risk of setting the market risk premium too low outweighed the downside risk of setting the market risk too high (and thus discouraging the regulated firm's discretionary investment).[19] This position of preferring an upwards bias in the selected WACC was also adopted in the hypothetical efficient operator WACCs recommended to ComReg, the Irish telecoms regulator, by Europe Economics[20]. The principle of 'aiming up' with the WACC attempts to mitigate for the

18 A small-company premium is based on the idea that small companies have 1) lower asset liquidity (higher equity return is needed for lower liquidity funds) and 2) higher debt issuance costs (higher costs from using bank loans or other debt, rather than corporate bonds).

19 See paragraphs 6.85 and 6.86 of http://stakeholders.ofcom.org.uk/binaries/consultations/823069/statement/statement.pdf.

20 Europe Economics, 2014. Cost of Capital for Mobile, Fixed Line and Broadcasting Price Controls, Report for ComReg

asymmetry in consequences which arise from setting the WACC too high (which raises current regulated prices) or too low (which affects longer-term investment decisions by the regulated firm).

Q8: Do you agree with the estimated WACC for fixed and mobile networks?

The use of point estimates closer to the estimated maximum WACC than the minimum is a reasonable assumption in order to reduce the risk of under-pricing the WACC, consistent with views expressed by other regulators and the principle of balancing long- and short-term impacts by 'aiming up'. Overall, the estimated WACCs for fixed and mobile networks appear reasonable for the developing country of Jamaica, and our only recommendation is to slightly adjust the inflation projections used to convert from USD to JMD WACCs.