Office of Utilities Regulation

RECONSIDERATION OF THE OFFICE'S DECISION: DETERMINATION NOTICE (TEL2009005_DET001) "ESTIMATE OF THE WEIGHTED AVERAGE COST OF CAPITAL FOR TELECOMMUNICATIONS CARRIERS"

BEFORE THE OFFICE OF UTILITIES REGULATION
OF JAMAICA

3rd Floor, P.C.J. Resource Centre, 36 Trafalgar Road, Kingston 10, Jamaica
West Indies

FINAL DECISION

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Adoption Date: August 29, 2011

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OFFICE OF UTILITIES REGULATION

August 24, 2011

DOCUMENT TITLE AND APPROVAL PAGE

DOCUMENT NUMBER: TEL2009005_DET001_RCN001

DOCUMENT TITLE: RECONSIDERATION OF THE OFFICE'S DECISION: DETERMINATION NOTICE "ESTIMATE OF THE WEIGHTED AVERAGE COST OF CAPITAL FOR TELECOMMUNICATIONS CARRIERS"

1. PURPOSE OF DOCUMENT

This document contains the OUR's Decision on Cable and Wireless Jamaica's application for reconsideration of its decision on the Estimate of the Weighted Average Cost of Capital for Telecommunications Carriers.

ANTECEDENT DOCUMENTS

Document Number	Description	Date
TEL 2008/05: Con/01	Consultation Document on Estimate of the Weighted Average cost of Capital for Cable and Wireless Jamaica.	May 9, 2008
TEL 2009/05: Con/01	Second Consultation Document on Estimate of the Weighted Average Cost of Capital for Telecommunications Carriers in Jamaica.	August 31, 2009
TEL2009005_DET001	Estimate of the Weighted Average Cost of Capital for Telecommunications Carriers Determination Notice.	December 9, 2010

APPROVAL

This Document is approved by the Office of Utilities Regulation and the decision becomes effective **August 29, 2011.**

On behalf of the Office:

Ahmad Zia Mian
Director General

August 24, 2011

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STATEMENT BY THE OFFICE:

This matter comes before the Office of Utilities Regulation ("Office") for its consideration of an application for reconsideration of the Determination Notice Document No: TEL2009005_DET001, the "*Estimate of the Weighted Average Cost of Capital for Telecommunications Carriers*" issued on December 9, 2010 (the "Determination Notice"). Subsequent to the issuance of its decision the Office received an application from Cable and Wireless Jamaica Limited (t/a LIME) dated December 22, 2010 requesting reconsideration of certain aspects of its decision.

LIME has pursuant to Section 60 (5) (b) of the Telecommunications Act, 2000 ("the Act") requested that the Office reconsiders its decision and that a stay of the implementation of the Determination Notice be granted pending the outcome of the reconsideration.

LIME contends that the Office's decision contains theoretical and methodological errors that have materially impacted the outcome of the weighted average cost of capital (WACC) estimates. LIME is also of the view that the decision is based on certain assumptions which are inconsistent with good regulatory practice and as such, has downwardly biased the estimate of the WACC for both fixed and mobile networks. LIME further believes that the Office selected methods which would lead to a low return on capital and not consistent with those generally used to set the cost of capital for telecommunications carriers. As a result, it is LIME's position that the Determination Notice contains material errors of fact and asks that it be withdrawn.

In particular, LIME states that the Determination Notice contains material errors of fact with respect to the risk free rate, equity risk premium (ERP), and small company premium.

RISK FREE RATE

It is LIME's view that the Office's use of spot rates in arriving at the risk free rate while at the same time using long term historical averages for determining the ERP is inconsistent with the forward-looking premise of the WACC and results in an estimate of the risk free rate that is unduly affected by short term fluctuations. This it claims is especially the case given the recent period of extremely low interest rates. As such, LIME requests that the Office adopts the approach of using longer-term historical data in arriving at the risk free rate as recommended by NERA (the consultant for LIME) in its response to the second Consultation Document.

EQUITY RISK PREMIUM

LIME asserts that the Office's approach of using long-term historical data to estimate the ERP used in the cost of capital calculation is factually erroneous and of material

significance. Firstly, LIME is of the view that both the ERP and the risk free rate should be estimated using either long-term data or recent data.

Secondly, LIME contends that the Office gave significant weight to geometric ERP by using an ERP that is the midpoint of the geometric and arithmetic average ERP. It claims that the majority of academics, finance experts, and regulatory bodies favour the use of the arithmetic average when determining the ERP. As such, it concluded that the ERP should be 6.03% and not 5.07% as used in the Office's determination.

Further, LIME declares that the implied ERP estimated by the Office is flawed in several ways; these are listed below.

- *"First, the OUR combines inconsistent data sources in its analysis, which is likely to lead to a biased estimate, more specifically:*

    - *The OUR uses an index value for the S&P 500 as of September 2009 and a dividend buyback yield for the S&P 500 as of December 14, 2009.*

    - *The OUR's growth rate assumption of 5.89% (applied over the first 5 years) is apparently based on a 5 year average of the historical dividend and buyback growth rates; this is likely not to be consistent with the implied growth rate underlying the observed index value of the S&P 500 as of September 2009. Note IBES, Bloomberg and others provide long-term dividend and earnings forecast at concurrent points in time.*

- *Second, the OUR's specification of the DCF [Discounted Cash Flow] model is not consistent with the model's application in the regulatory context and is likely to lead to a downward bias. In the US regulatory context, where the DCF model is the preferred method of estimating the allowed cost of capital, the model is generally specified using only one growth rate, which is set equal to analysts' expected long-term earnings or dividend growth rates. The OUR's use of a risk free rate of 3.01% as the long-term dividend growth rate appears arbitrary, inconsistent with economic principle and in contradiction with regulatory practices elsewhere.*

- *Third, the OUR does not use standard data sources for calculating an implied ERP. The OUR sources its dividend yield from a news release as of December 14, 2009. Further, the OUR does not provide a source for the initial growth rate of 5.89% (applied over the first 5 years), which apparently is based on historical data."*

LIME also claims that there are good reasons to believe that the forward-looking ERP is greater than the long-term historical average ERP and hence the OUR's conclusion that the implied ERP is below the long-term average ERP is

implausible. Based on the above, LIME concludes that the Office's ERP determination is flawed and biases the WACC downward.

SMALL COMPANY PREMIUM

LIME advises the Office that because the capital asset pricing model (CAPM) cannot quantify a small company premium it is not a valid reason to dismiss the premium which can be estimated using other models. As such, LIME argues that the Office has not demonstrated by the use of facts or empirical data that it is not relevant.

LIME also claims that it is an "*accepted fact that the economic literature recognizes that investors, such as LIME, which are subjected to CAPM-based method of deriving their cost of equity may require an extra premium for trading cost associated with transacting in such an illiquid stock (as that of LIME), since they are not compensated for such costs in the CAPM-based cost of equity*."

LIME further holds the position that even though the Government of Jamaica (GOJ) securities may reflect an illiquidity premium relative to US Treasury securities, this premium is likely to be less than that faced by small operators in Jamaica. This is as a result of GOJ accessing debt markets at more favourable rates than local telecommunications carriers.

The Office posted the application for reconsideration on its website at www.our.org.jm on January 28, 2011 and requested comments from interested parties by February 25, 2011. No response was received.

DECISIONS ON RECONSIDERATION REQUEST:

The Office has therefore given further consideration to each request and now issues the following response.

RISK FREE RATE

1. LIME requests that the Office "*reconsiders its Determination in respect to its estimate of the risk free rate and adopts the approach recommended by NERA to use longer-term historical time series to estimate risk free rate and not a spot rate*". LIME prefaces its application for reconsideration on the grounds that the Office's decision suffers materially from theoretical and methodological errors.

2. The Office disagrees with LIME in this regard and affirms that its choice of the risk free rate is strongly grounded in theory. The CAPM is a forward-looking technique and as such the values chosen for the variables in the CAPM should generally be prospective even if they are estimated using

retrospective data. Shapiro and Balbirer[1] (2000) state that **one of the common errors in using the CAPM to calculate the risk-adjusted cost of capital is "*using the historical average Treasury bond or Treasury bill return as the risk-free rate in the CAPM instead of using the actual (current) rate. You must use the current risk-free rate (emphasis added).*"**

3. This point is further supported by Professor Aswath Damodaran[2], (December 2008), when he states that a

   "... common (and dangerous) practices when confronted with rates that deviate from what they regard as "normal", analysts often substitute what they feel is a more normal rate when valuing companies. If the Treasury bond rate is 3.5%, an analyst may decide to use 5% as the normal risk-free rate in a valuation. Though this may seem logical, there are three potential problems. The first is that "normal" is in the eyes of the beholder, with different analysts making different judgments on what comprises that number. To provide a simple contrast, analysts who started working in the late 1980s in the United States, use higher normal rates than analysts who joined in 2002 or 2003, reflecting their different experiences. The second is that using a normal risk-free rate, rather than the current interest rate, will have valuation consequences. For instance, using a 5% risk-free rate, when valuing a company, will lower the value that you attach to the company and perhaps make it over valued. However, it is unclear whether that conclusion is a result of the analyst's view on interest rates (i.e., that they are too low) or on the company. Finally, interest rates generally change over time because of changes in the underlying fundamentals. ***Using a normal risk-free rate, which is different from today's rate, without also adjusting the fundamentals that caused the current rate, will result in inconsistent valuation… (emphasis added)****"*

4. In this regard, it is the Office's position that theory clearly speaks to the use of the current yield as a measure of the risk free rate. The Office therefore disagrees with NERA's claim that the risk free rate should be estimated by averaging over a long period in favour of using the current rate as dictated by academic literature. As such, the nominal market yield on 10-year U.S. Treasury securities with constant maturity as at July 2010, which is 3.01% was used as the risk-free rate for both fixed and mobile networks as it represented the most current monthly yield at the time of writing the Determination Notice.

Having regard to all of the above the Office denies LIME's request and specifically reaffirms Determination 5.

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[1] Shapiro, A., Balbirer, S., 2000, *Modern Corporate Finance - A multi Disciplinary Approach to Value Creation*, Chapter 10, pg, 329.

[2] Professor Aswath Damodaran, December 2008, *What is the risk-free rate? A Search for the Basic Building Blocks.*

EQUITY RISK PREMIUM

5. LIME argues that the Office's use of an ERP based on long-term historical data is factually erroneous as it is internally inconsistent with the use the current rate in determining the risk free rate. It holds the view that "*sound economic principle requires that both estimates should be based on either long-term historical data (as undertaken by NERA) or on recent data*." LIME refers to the Office's use of a spot rate for estimating the risk free rate and a long-term historical average for estimating the ERP as being "*internally inconsistent*" as both estimates are arrived at using data of varying lengths of time. As such, LIME recommends using the approach taken by its consultant NERA of estimating both variables using long-term historical data.

6. As stated in the Determination Notice, the Office rejects LIME's notion of internal inconsistency. An internal inconsistency between risk free rate and the market risk premium generally refers to the use of a security of one maturity for estimating the risk free rate in the CAPM and estimating the market risk premium using a security of a different maturity as stated by Shapiro and Balbirer (2000, pg 329).

7. If LIME's notion of what is "*internally inconsistent*" is to hold, then NERA's approach is also "*internally inconsistent*". This is due to the fact that NERA average data over the period of the most recent 10 years when estimating its risk free rate but instead used a significantly longer period of 109 years of data when estimating its historical EPR. Therefore, this must also be "*internally inconsistent*" as both of NERA's estimates were determined using historical data of varying lengths of time. However, as stated previously, the Office rejects this notion of what constitutes an internal inconsistency as it does not accord with theory and practice.

8. The Office also rejects any notion that the ERP should be estimated using only current data as suggested by LIME. LIME's position in this regard is also contrary to that of its consultant NERA who states in the report to the OUR that "*using time series data on actual realised returns to estimate expected returns has theoretical support and is widely used by academics and practitioners. An estimate of the ERP based on long-run historical data is highly objective, easily understood and produces stable results over time which are all key criteria of good regulatory practice*." LIME's suggestion is also countered by Shapiro and Balbirer (2000, pg. 329) which state that one of the common errors in using the CAPM to calculate the risk-adjusted cost of capital is "*using a market risk premium based on the most recent returns rather than using a long time series. As we indicated in chapter 6, using a long time series will reduce the standard deviation of your estimate."*

9. LIME also highlights as a methodological error, the Office's use of the geometric average ERP as the lower bound for the ERP in its cost of capital estimate. LIME contends that by doing so, the Office gave significant weight

to the geometric mean which biases the estimate downward. It claims that "*the majority of academics, finance experts and regulatory bodies favour the arithmetic mean of historical returns*".

10. As pointed out by the Office in the Determination Notice, one of the problems with using historical data to estimate the ERP is deciding which averaging technique (geometric or arithmetic) should be used. Contrary to what LIME has stated in its application for reconsideration, finance theory suggests that where returns are serially correlated and the time horizon is long, an ERP using the geometric mean should be used.

11. In this regard, Damodaran[3] states that

> "*The conventional wisdom is that the arithmetic mean is the better estimate. This is true if:*
>
> *1. you consider each year to be a period (and the CAPM to be a one-period model);*
> *2. annual returns in the stock and bond markets are serially uncorrelated.*
>
> *As we move to longer time horizons, and as returns become more serially correlated (and empirical evidence suggests that they are), it is far better to use the geometric risk premium. In particular, when we use the risk premium to estimate the cost of equity to discount a cash flow in ten years, the single period in the CAPM is really ten years, and the appropriate returns are defined in geometric terms. In summary, the arithmetic mean is more appropriate to use if you are using the Treasury bill rate as your risk-free rate, have a short time horizon and want to estimate expected returns over that horizon."*

12. Wright, Mason, and Miles (2003)[4] state the following with reference to the choice of arithmetic or geometric mean:

> "*Eminent academic economists have come down on both sides of the fence. Thus e.g., Campbell and his various co-authors typically assume lognormality, as in (2.6), and hence stability of the mean log return and the geometric average, as implicitly, do Dimson et al. In contrast, e.g., Fama and French have, in various papers, worked on the assumption that the arithmetic mean return is stable.*

[3] Source: http://www.wiley.com/college/fin/damodaran283320/dis/s_a_dis_07.html

[4] Wright, S., Mason, R., Miles, D., 2003, A Study into Certain Aspects of the Cost of Capital for Regulated Utilities in the U.K.

Our (not very strong) preference would be to side with Campbell, since the assumption of lognormality of returns is consistent with the feature of financial returns that they cannot fall below -100%, but are unbounded in the opposite direction. But given the absence of a clear consensus on the best way to model the underlying properties of returns, the only clear-cut recommendation must be to deal consistently with the difference between the two averaging methods, to be precise in noting which estimate is being used in any context, and to be aware of the potentially significant differences between the two."

13. *Therefore,* the Office's position is that there is as yet no consensus among practitioners and academics regarding which averaging technique is more appropriate. In light of this fact, the Office chose not to give preference to either type of average and instead chose to weight the geometric mean and the arithmetic mean equally.

14. In keeping with the convention of using an interval estimate as suggested by Digicel where the value of a variable cannot be determined with relative certainty, the Office used the geometric mean ERP as its lower bound estimate and the arithmetic mean as the upper bound. In arriving at its point estimate, the Office used the mid-point of the two estimates. The Office views the resultant ERP as a fair measure of what the true ERP is likely to be and disagrees with LIME that this biases the ERP downward. This position is supported by recent regulatory decisions in other jurisdictions as can be seen in Table 1 below, which shows that the range of estimates used by the Office is generally in line with those of other regulators.

Table 1 - Recent Regulatory Decisions on Market Risk Premium

	Fixed	**Mobile**
OUR - Determination (2010)	4.11% - 6.03%	4.11% - 6.03%
TRA (2009)	4.10% - 5.10%	4.10% - 5.10%
URCA (2009)	4.00% - 6.00%	4.00% - 6.00%
FICORA (2008)	-	4.06%
Ofcom (2009 and 2007, respectively)	5.00%	4.50% - 4.55%
ComReg (2008)	4.80% - 6.00%	-
ICT (2008)	6.00%	6.00%
MCA (2008)	5.00% - 6.00%	5.00% - 6.00%

15. LIME goes on to claim that the Office's implied ERP is flawed for several reasons. However, LIME seems to have arrived at this conclusion based on its misunderstanding of what was done by the Office. This is further explained below:

    - LIME claims that the Office combined inconsistent data sources in its analysis by using an index value for the S&P 500 as at September 2009

and a dividend and buyback yield for the S&P 500 as of December 14, 2009. This is incorrect. The estimate was arrived at using an index value and a dividend and buyback yield for the S&P 500 as at September 2009. LIME's misunderstanding seems to have resulted from the fact that the source of the dividend and buyback yield was an S&P Press Release of December 14, 2009. However, this release contained a time series of dividend and buyback yields, as such the Office used data corresponding to the period September 2009.

- LIME further claims that the OUR's growth rate assumption of 5.89% based on an historical average is likely to be inconsistent with the implied growth rate underlying the S&P 500 Index as of September 2009. The Office accepts that there may be some validity in LIME's position in this regard as the 5.89% used by the Office was based on the average dividend and buyback yield over the previous five years rather than a forecasted growth in earnings. Damodaran's[5] data page indicates that analysts growth estimate in 2010 was 6.95%[6]. The Office will recalculate the implied ERP for 2010 by substituting the 6.95% growth estimate for the 5.89% used in the calculation in the Determination Notice.

  On September 2009, the S&P 500 index closed at 1044.55; at the time the dividend and buyback yield was 3.71%. The analyst estimate of growth in earnings is 6.95%. However, this high growth rate cannot continue infinitely, as such, this rate will be used as the growth rate in dividend and buyback yield for the succeeding five-year (short-term) period after which, the risk free rate of 3.01% will be used as the long-term growth rate. Table 2 shows the cash flows from dividend and stock buybacks for the five years of high growth and then the first year of low growth. The dividend and buyback for the first year was calculated by multiplying the index value at September 2009 (1044.55) by the dividend and buyback yield for the corresponding period (3.71%), the result is then multiplied by the forecasted growth rate for 2010.

Table 2 - Estimated Cash flows on S&P 500 Index - September 2009

Year	Dividends and Buyback
1	41.45
2	44.33
3	47.41
4	50.70
5	54.23
6	55.86

[5] http://pages.stern.nyu.edu/~adamodar/New_Home_Page/data.html

[6] Damodaran indicates that US related data is sourced from Value Line.

The Office estimated the implied equity risk premium as at September 2009 using the following equation:

$$1044.55 = \frac{41.45}{(1+r)} + \frac{44.33}{(1+r)^2} + \frac{47.41}{(1+r)^3} + \frac{50.70}{(1+r)^4} + \frac{54.23}{(1+r)^5} + \frac{55.86}{(r-0.0301)(1+r)^5}$$

The equation is then solved for the required rate of return, with the result being 7.55%. The risk free rate (3.01%) is then subtracted from the return. This yields an implied equity risk premium of 4.54% rather than the 4.34% originally estimated.

- LIME asserts that the DCF model used by the Office was inconsistent with the model's use in other regulatory contexts such as in the US where the model is the preferred choice in estimating the cost of equity. It claims that in such situations, the model usually uses only one growth rate. Unfortunately LIME did not provide any source document to substantiate its claim of a single growth rate. However, there are numerous variations of the DCF model as alluded to by the Office in the Determination Notice. Further, the two-step approach used by the Office is indeed similar to the approach used in the US regulatory context. A 2008 Policy Statement from the Federal Energy Regulatory Commission[7] indicates that the "*Commission averages short-term and long-term growth estimates in determining the constant growth of dividends (referred to as the two-step procedure)"*. This approach is indeed consistent with that used by the Office.

- Finally, LIME claims that the Office did not use "*standard data sources*" in estimating the implied ERP and highlight as an example the Office's use of a December 14, 2009 news release. The company further states that the Office did not provide the source of its initial growth rate of 5.89%. The Office is unsure of what LIME would describe as "*standard data source*s", however, the Office finds LIME's comment peculiar in this regard since the data being used relates to the S&P 500 Index and the News Release from which the data was taken was issued by S&P itself. The Office accepts that the source of the 5.89% was not explicitly indicated in the Determination Notice. The source of the 5.89% is the S&P News Release of December 14, 2009.

16. LIME espouses the view that the Office's estimate of an implied ERP which lies below its long run estimate (here we assume that the long-run estimate that LIME is referring to is the long-term historical average) is implausible. The Office finds LIME's position in this regard to be incorrect. In fact, the very existence of the situation which LIME describes as '*implausible*' is the basis of the equity risk premium puzzle where it is argued that historical

[7] Federal Energy Regulatory Commission, April 17, 2008, *Composition of Proxy Groups for Determining Gas and Oil Pipeline Return on Equity*.

equity risk premiums are higher than the amount which would be suggested using typical utility models for wealth. This is often used as an argument against the use of historical ERPs which indicates that the Office's estimated ERPs are indeed consistent with theory. The Office is not suggesting that the historical ERP must always be above the implied ERP, the Office is merely pointing out that this occurrence is not at all unusual and as such does not see it as a cause for concern. Damodaran[8] (September 2008) arrived at similar results when estimating the ERP for 2008 where markets were similarly volatile to current markets. His implied ERP as at September 2008 was 4.54% which was below his geometric mean ERP of 4.79%. Regarding the implied ERP, Damodaran came to the conclusion that:

> "*The implied equity premium has generally been lower than the historical risk premium for the US equity market. Even in 1978, when the implied equity premium peaked, the estimate of 6.50% is well below what many practitioners use as the risk premium in their risk and return models. In fact, the average implied equity risk premium has been about 4% between 1960 and 2007, lower than the historical risk premium of 4.79%. We would argue that this is because of the survivor bias that pushes up historical risk premiums."*

In light of the foregoing, the Office rejects that there is any material error of fact with respect to the estimated ERP and as such rejects LIME's request and specifically reaffirms Determination 10.

SMALL COMPANY PREMIUM

17. LIME advises the Office that because the CAPM cannot quantify the small cap premium, this is not a valid reason for its exclusion. The Office would like to point out that it has never used this as a reason for excluding the small cap premium. The Office's position is that under CAPM, investors are only compensated for systematic risks. While the inclusion of a small cap premium may be justified under other risk models, it cannot be justified under the CAPM. The Office remains committed to the use of the CAPM as it remains the most trusted model of risk and return. Therefore, the sole reason for the exclusion of a small cap premium is because its inclusion would contradict the underlying theory of CAPM. Given LIME's insistence on maintaining consistency with theory and regulatory practices, the Office finds it rather peculiar and self-serving that LIME is arguing for the inclusion of a small cap premium which clearly contravenes the underlying theory of the CAPM and proper regulatory practices.

[8] Professor Aswath Damodaran , September 2008, *Equity Risk Premiums (ERP): Determinants, Estimation and Implications.*

18. LIME also argues for the inclusion of small cap premium on the basis that there is extra trading cost associated with local stocks due to their illiquidity. In the risk and return models that have developed from conventional portfolio theory, in particular the CAPM, there is no allowance for company specific risks such as an illiquidity of a particular stock, only market risk is compensated for as it cannot be avoided.

19. Even if the argument could be made that companies in the Jamaican market face higher transaction costs and as such illiquidity is a legitimate market risk, the inclusion of a specific premium for illiquidity would still be inappropriate from a practical point of view as it would be double counting risk which is already accounted for in the country risk premium. The country risk premium used in the estimation of the cost of capital is the sovereign default spread. The country risk premium is the difference between the yield on GOJ U.S. dollar sovereign bonds and the risk free rate.

20. The notion that investors will pay less for illiquid assets applies to bonds just as much as it applies to equities. The risk free rate used is the yield on U.S. 10-year Treasury securities which are highly liquid and hardly contains any illiquidity premium. On the other hand, the yield on GOJ treasury securities is highly illiquid compared to the risk free rate. This illiquidity will manifest itself in the form of higher yields on GOJ securities thus rewarding investors for higher transaction costs of holding these bonds. LIME contends that the illiquidity of local companies is higher than that of GOJ. However, it is worth noting that the Office also used higher than average betas for local fixed line and mobile services companies which provides additional compensation for the inherent illiquidity of the local companies.

Having regard to all of the above the Office denies C&WJ's request for the inclusion of a small cap premium and specifically reaffirms Determination 11.