Comments on Weighted Average Cost of Capital methodology

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CERPartners comments on "Draft tool to determine the weighted average cost of capital (WACC)

(Version 01)

We appreciate the effort put in the design of a WACC tool to support the additionality tool and guidelines. We would like to provide you with our thoughts and trust our comments will have a constructive impact on the further development of the tool.

We are a Consulting Group specialized in Strategic Finance and Performance Monitoring, Regulatory Support and PDD Investment analysis. The Group was founded by Gergtjan Schut in 2007, who has more than 10 years experience in advising Energy, Telecom, Cable and International Airports in arguing cost of capital for regulatory purposes. The group has been advising CDM developers for more than 5 years. The group consists of finance, legal and operational consultants and has affiliations with the Erasmus University Rotterdam and Nijmegen School of Management.

In analyzing the tool, we recognize to apply general finance theory to the CDM practice and also that it is a challenging area given the lack of good market information in developing nations. Given the fact that the expected rate of return and its cost of capital is by its very nature something that is not written in stone, quotes or receipts this is a tough challenge.

From our point of view the main goal of the WACC tool should be to strike the right balance between practical application and finance principles. We believe that this balance is too much to the practicality side from the perspective of the EB and would have a very negative impact on identifying eligible CDM projects.

From our point of view the draft tool tries to create a combination between modern portfolio theory and a credit model. We recognize the practical challenges that the tool needs to face up to with regards to anticipating the lack of financial market information, demonstrability of the parameters and the conservative principles used in evaluating additionality. At this point in the development of the tool, we believe that there is room for improvement and we would like to contribute to strengthen the tool.

We identified the following main weaknesses that would need to be addressed:

1. The tool is not applicable in Sub Saharan Africa and other smaller developing countries.
2. The outcome of the tool is a country level cost of capital, which is not in line with the requirements to demonstrate additionally.
3. Tool assumes that the price of project specific risk can be incorporated practically in the cash flows.
4. Tool applies historic cost of equity from mature, mostly developed countries to developing/emerging nations.
5. Lack of conservatism in the determination of cost of equity due to overestimation of stable sectors and underestimation of cost of equity for volatile sectors

6. Tool does not provide guidance on converting discount rates and cash flows into other currencies consistently

General comments on the chosen approach

In this document we propose two methods to further develop the tool to become more practical, accurate and conservative. The first option is to redesign the cost of capital method fully based on a bottom-up factor model. This would give the EB more control over the value of the risk pricing parameters that would go into the WACC. The other option is to amend the present draft tool on the most critical improvement areas.

Option 1: Simplification of the cost of capital calculation used in evaluating additionally using a bottom up multi factor model with centrally derived values.

In developing an alternative model for the purpose in evaluating project additionality we started from scratch and used the principles of CDM to determine what would be the most appropriate model. The leading principles in our development effort were the knowledge gap on corporate finance in developing nations and the conservative nature in demonstrating additionality. This led us to the conclusion that from the models available in finance, the multi factor bottom up cost of capital model could have some big advantages above the credit model or the MPT model.

We believe that the biggest challenge lies in the determining a fair value for the cost of equity. The cost of debt is easier to demonstrate or estimate, because those costs are documented and come from external suppliers of capital. The cost of equity is more difficult, mainly due to the fact that it states the minimum amount of return required to warrant an investment from investors/equity providers. No quotes are available to demonstrate these costs. The present tool, probably out of conservatism, rejects the entity/investment specific equity costs to eliminate these uncertainties out of the additionally process. This leaves us with a gap between the genuine cost of equity that faces investors and the additionally analysis. To bridge this gap we believe that a bottom-up multi factor model for the cost of capital could be helpful. The alternative model would remove a significant part of uncertainty for the evaluators and developers and recognize the genuine equity costs excluded in the present model.

Assuming the cost of debt consists of:

1. Risk free rate
2. Country risk premium
3. Project or legal entity default risk
4. Tax shield

Within the bottom-up model, the risk free rate and country risk premium would be provided list of countries and their estimates rates. This differs from the existing method predominantly, because the list could include geographies not covered by the existing tool, like most of sub Saharan Africa.

On top of these risks the alternative tool uses synthetic default ratings to provide an estimation of default risk. The investment analysis will provide an interest coverage ratio, which has proven in several studies to be a good proxy for company default ratings[1]. By linking these synthetic ratings to rates within a table published by the EB, a more accurate cost of debt could be incorporated in the cost of capital. The method for incorporating the tax shield will remain the same.

[1] Damodaran, A., "Applied Corporate Finance" (2010), John Wiley & Sons, USA

Assuming that the equity cost of capital consists of the following main components:

1. Risk free rate
2. Country specific risk
3. Industry specific risk
4. Financial leverage
5. Operating risk

The bottom-up multi factor cost of equity model consists of centrally determined prices for risk of these components. This would require a one-time discussion on the principles and values of these separate components, after which determining the cost of equity to be very comprehensive and make it possible for all participants to ensure that the cost of capital used in demonstrating additionality will be accepted by the EB.

The risk free rate and country specific risk are relatively easy to provide by using mature market risk free rates and the provision of table of values per country. For the country specific rate some synthetic rates need to be calculated to complement the existing CDS tables and country ratings.

The industry specific rates could be published by SIC or equivalent Industry code, perhaps linked to the sectors used in the methodologies. Examples of an industry specific list can be found at several places[2].

The industry specific rate can be adjusted using a beta which is adjusted using two investment specific characteristics, financial leverage of the investment and its operating leverage. Both of these factors can be extracted from the investment analysis.

Alternatively the rates for financial leverage and operational leverage can be developed based on synthetic ratings of risk of default. This would be based on a table of ratings and associated interest coverage ratio of the project. The rates per rating could be provided by mature markets as a proxy. A beta could be used to further adjust the rates used to make it possible to encompass the additional costs associated with high operational leverage in the cash flows.

The exercise of estimating a cost of capital for additionality purposes would consist of looking up the project/ entity specific characteristics in the tables provided and adding up the rates. This would make the process very comprehensive, transparent and accessible for all participants.

Downsides of alternative model

This model departs from the conventional process in estimating the cost of capital and might obtain push back from the developer community. In reality however, the challenges facing the additionality tool are not the same as other regulatory environments. The CDM functions with a significantly different environment then in which conventional finance theory was developed. Using a strongly structured model as described above fits this new environment better, given the absence of mature markets and above all creates a level playing field for all CDM participants as it eliminates the knowledge gap. This would reduce the time spend on evaluating projects that get rejected due to poor

[2] See: "Stocks, Bonds, Bills, and Inflation Valuation Edition 2010 Yearbook", (2010), Ibbotson Associates or alternatively, http://pages.stern.nyu.edu/~adamodar/ for the lists published by Aswath Damodaran. Also an example can be found in Pratt, S.P, Grabowski, R., "Cost of Capital, Application and Examples"(2008), Wiley, USA

argumentation of the cost of capital in the investment analysis. A worked out version of this model set-up is available upon request.

Option 2: Strengthening the main weaknesses of the present draft WACC tool

We would like to propose several ways in which the right balance can be struck while keeping a strong emphasis on practical application. In the present WACC tool draft there seems to be a preference for using the credit model to estimate a cost of capital with some elements of the MPT model. To provide constructive suggestions to support a further development of the tool, we will use the Draft WACC tool document structure and provide comments and suggestions where appropriate.

Definitions:

Discount rate: the Discount rate is substantially different then the capitalization rate. To avoid further confusion we recommend omitting the text "it is also called capitalization rate"[3].

Debt/Equity Ratio or Debt-to Equity Ratio:

1. The text "The higher ratio, the greater the financial leverage and financial risk (that is, risk of illiquidity and insolvency) of the firm." This seems inconsistent with the WACC Tool as it is proposed at this time. Due to the omission of the entity or asset specific default risk, the proposed WACC calculation method the cost of capital is lowest, when fully financed with debt. As this is not realistic, we propose to keep this text but amend the WACC calculation method to include the cost of higher risk due to financial risk.
2. As the cost of capital is directly sourced and linked to market rates, it is important for consistency purposes to in principle use market values for debt and equity in cases where it is possible.
3. As we try to deduce the cost of capital of the investment/project, the debt/equity ratio should apply to the financing of the project not of the "firm", project entity or investor. This is also stated in the additionality tool option I and III of the financial analysis; "*When applying Option II or Option III, the financial/economic analysis shall be based on parameters that are standard in the market, considering the specific characteristics of the project type, but not linked to the subjective profitability expectations or risk profile of a particular project developer."*[4].

Scope and applicability

The WACC calculation tool document states; *"any investment analysis must be done in the same currency selected for the WACC calculation"*. As this is in principle correct, we propose to include in the document the tools and techniques to assure a correct conversion of cash flows and discount rates from one currency to another using expected inflation rates[5]. Incorporating this text will avoid future problems and common pitfalls in this area. We would be to provide an example text when requested.

[3] A capitalization rate is merely a divisor applied to one single element of return to estimate a present value. Capitalization rate equals discount rate only when each future cash flow is equal and the expected returns are in perpetuity.

[4] *"(EB39 Annex 10, "Tool for the demonstration and assessment of additionality", (Version 05.2)*

[5] O'Brien, T., "The U.S. Dollar Global CAPM and a Firm's Cost of Capital in Different Currencies", Working paper, July (2005); "Foreign Exchange and Cross-Border Valuation", Journal of Applied Corporate Finance (Spring/Summer 2004): pp.147-154

Proposed WACC Tool methodology

Step 1: Determine whether r is estimated based on the situation of the entity undertaking the project activity or based on standard market expectations for the project type

As the additionality tool prescribes a project specific view and rejects the use of investor specific parameters, we would look forward to an elaboration on the split in step 1. Using entity specific parameters can only be used as a proxy for investment/project specific parameters if investment specific parameters are not possible to obtain or demonstrate satisfactory. The cost of capital estimated for a legal entity does not represent the cost of capital for the investment made by the legal entity[6], especially if used to ascertain the financial attractiveness of the investment in a project[7]. The split in Case (I) & (II) does not seem to be relevant.

Step 2: Determine the status of the legal entity that will host the project activity assets

Additionally we do not understand the use of accounting book value of the legal entity or the use of a default debt to equity ratio of 50%. Our objections and recommendations are the following;

1. **Use of firm specific book values to determine debt-equity ratio.** To ascertain the cost of capital in the context of demonstrating additionality the investment specific parameters, not entity specific parameters should be dominant. It is the investment and not the investor that determines risk priced in a cost of capital. Therefore the accounting book values of the investor/legal entity are not relevant.
2. **Using accounting book values**. The cost of capital is a market derived cost and should therefore be based on market values of debt and equity to avoid mismatching. We do understand the use of book values as a proxy for the market values but we propose to not exclude the use of market values when possible.
3. **Accounting book values represent values of today only**; we would propose to use forward looking values for the debt to equity values as the cost of capital is forward looking. This could be realized in two ways:
    a. Use the annual investment financing flows and balance sheet as the determining factor for a debt to equity ratio throughout the project.
    b. Use a target or optimal debt to equity ratio to reflect the best estimate for a long term investment.
4. **Fixing a subjective default rate of 50% is not satisfactory and should be rejected**. Given the difficulties in obtaining debt financing for projects in developing nations, assuming 50% debt financing for CDM project activities is not realistic. If there is a genuine need for standardized debt to equity ratios, we would suggest using country and industry mean data as a last resort to estimate debt/equity parameters[8].
5. **Using accounting values** instead of economic values for the debt to equity ratio excludes the financing liabilities that are contained in leasing and equivalent contract types. To avoid taking advantage of lease financing or other forms of off-balance sheet debt to boost the equity component in the equation, we propose to include the capitalization of leases as a requisite in the estimation of the debt/equity ratio.

[6] Ibbotson Associates, Cost of Capital Workshop (Chicago: Ibbotson Associates, 1999)
[7] Richard A. Brealey, Steward C. Myers, and Franklin Allen, *Principles of Corporate Finance*, 8th ed. (Boston: Irwin McGraw-Hill, 2006), 216.
[8] Abe de Jong, Rezaul Kabir, and Thuy Thu Nguyen, "Capital Structure Around the World: The Roles of Firm and Country Specific Determinants," ERIM Report Series Research in Management (September 2007).

6. **Finance Structure:** The main assumption behind the use of the debt to equity ratio in the calculation of the WACC is that the financing structure remains constant. In CDM project activity this is not the case, especially if the tool uses book values. Through time, the debt will be repaid or assets depreciated, reducing the debt/equity financing proportion of the project. We would suggest the tool to include the option to incorporate the financing structure and its development through the investment horizon. By incorporating the debt to equity proportion over the life of the investment, the tool would stimulate a more conservative approach to evaluating investments by avoiding equity front loading effects in calculating IRR or NPV[9].

Our proposed approach is to redesign the first two steps and categories to be more in line with finance conventions used in investment analysis. We recognize that there is a need for a pragmatic approach in being able to estimate discount rates with insufficient financial market information the geographic location of the projects in developing nations. As the project attractiveness should be independent of who is investing in the project, it is not necessary to create different categories and method steps dependent on this categorization.

Step 3: Determine the average cost of debt financing

We look forward to a further elaboration on the use of three different options limited by the type of category created in step 1 and 2. Each of the options does not seem to be in line with finance practice, regulatory finance theory or make the tool more usable. We propose to simplify the process by supplying a general accepted method for calculating a market rate for debt financing of the project and provide options in how to demonstrate the parameters in the calculation. Additionally, the options have the following weaknesses:

Using option 3a: Based on historic rates for different kinds of financing. We can understand that from a practical point of view this option would seem to create tangible numbers to work from. These rates, however, do not portraits the true cost of debt. The main weakness is the exclusion of refinancing risk, which is especially important with the long term financing of CDM projects. Furthermore the financing rates are for the legal entity and do not incorporate the debt risk premium for the project. Because short term debt is excluded, a large part of the project financing cost is excluded in the analysis but could represent a substantial part of debt financing cost.

Using option 3b: We look forward to a further elaboration on why this option cannot be used when Case (I) in Step 1 applies. As using forward looking values is preferred, this option should be available for where Case (I) in Step 1 applies. As for a significant proportion of CDM investment will not be able to obtain a life to maturity for the entire expected life of the investment, we suggest including the possibility to convert the provided rates to match the life of the project and apply the applicable risk premium.

Using option 3c: This option does not seem able to estimate a ball park figure of the genuine cost of debt for a legal entity or a project activity. The use of government bonds could be used to get a cost of debt for the local government, which is more related to the risk of default for the host government. We look forward to a further elaboration on how government bonds without a suitable debt risk premium could be used in calculating the cost of debt for a project activity or even a legal entity.

[9] Morris, J.R., "Reconciling the Equity and Invested Capital Methods of Valuation When the Capital Structure Is Changing.", Business Valuation Review (March 2004), pp. 36-46

To strengthen the cost of debt calculation we would like to propose to add default risk to the risk premium by making it possible to use actual or synthetic ratings linked to empirically demonstrated costs. The synthetic ratings could be extracted by using the interest coverage ratio as a proxy to obtain an asset default risk rating where it is not available. This provides a transparent route in closing the gap between the actual expected cost of debt and the outcomes of the tool.

Step 4: Determine the average cost of equity financing

Comments on using the average historical global equity risk premium calculated by Dimson, Marsh & Stauntun (2005).

1. **Subjectivity**; there is a wide and intense discussion within the academic publications on the historic equity premium[10], how to actually calculate it and what to correct for. Using one arbitrary study as a stake in the ground would violate the conservative principles of the additionality tool. We would suggest using a less subjective view and allow for alternative views on this topic.
2. **Updates**; we would like to inform you that Dimson, Marsh and Stauntun have updated their numbers in 2010 which results in significant lower geometric and arithmetic means for the global equity risk premium. This demonstrates the volatility of this study and the challenges in citing one default number.
3. **Historical vs. expected equity premium**; Studies[11] have shown the actual negative correlation between historical equity premiums and expected equity premiums. We would like to propose that the tool demonstrates its understanding of the large difference between historical and expected equity returns[12]. From an applied perspective the biggest change that we would like to propose to get to a more true conversion of historic to expected premiums is to avoid using the geometric average for this purpose.
   From an empirical and theoretical point of view, it has been demonstrated[13] that the geometric average avoid the over estimation of **historical** performance of returns. The same studies show that the arithmetic average provides less statistical bias for the **expected** equity premium then, which is forward looking. Given the present status of our knowledge of expected returns and the chosen method for calculating the WACC we would suggest to use the correct (arithmetic) average for forward looking returns/expectations.
4. **Confidence interval**; when using the academic publications to warrant a fixed number as a default value of the equity premium does not do justice of the confidence intervals or statistical uncertainties of the studies. The standard error of the quoted percentages from the study of Dimson et al. (2005) is between 1.48-1.62%. Translated this would mean that if one would take the midpoint (average) as a default value, one would reject 50% of the equity premium values that according to this statistical study would be within 1 Standard Deviation

[10] See for a comprehensive overview: Fernandez, P., Aquiremalloa, J. and Liechtenstein H., "The equity premium puzzle: higher required equity premium, undervaluation and self-fulfilling prophecy" (2008), Working Paper, IESE Business School, University of Navarra, Madrid, Spain.
[11] Damodaran, Aswath, Equity Risk Premiums (ERP): Determinants, Estimation and Implications - The 2010 Edition (February 14, 2010). Available at SSRN: http://ssrn.com/abstract=1556382
[12] Mehra, R. and Prescott, E. (1985), "*The Equity Premium: A Puzzle*", Journal of Monetary Economics, Vol 15, pp. 145-161. Fernandez, P., Aguirremalloa, J. and Liechtenstein, H. (2008),"The equity premium puzzle: high required equity premium, undervaluation and self-fulfilling prophecy", Working Paper, IESE Business School, University of Navarra, Madrid
[13] See, e.g., Kaplan, P., "*Why the Expected Rate of Return Is an Arithmetic Mean*", Business Valuation Review (September 1995); SBBI Valuation Edition 2002 Yearbook, 71-73; Kritzman, M., "*What Practitioners Need to Know about Value*", Financial Analysts Journal (May/June 1994): 12- 15; Bodie, Z., Kane, A. and Marcus, A.J., "*Investments*" (1989): 720-723.

of the mean. This is violating the conservative principles of the additionality tool and rejects a large proportion of project activities that actually use the values from Dimson et al. (2005, 2008).

5. **Developed nations**; the historical equity premium that Dimson et al (2005) have observed is limited to mature markets only. This study is trying to resolve the equity premium puzzle and therefore has never had the ambition to have its values being used for regulatory purposes. The WACC tool assumes by using this number that the equity premium and associated risks are the same in developing nations as they are in developed nations. We do not think that this assumption is valid and therefore we propose to use a more emerging market/ developed nation specific equity premium. In general we would suggest using a country specific country risk premium.

Using a mature market global Equity Premium presented in the WACC tool does not take into account several layers of risk and we would like to understand why the tool deviates from prudent and conservative approaches conventionally used in investment analysis. One of those layers for which investors deem compensation in reality is the industry specific volatility. The inclusion of a Beta using the Capital Asset Pricing Model (CAPM) would make it possible to adjust the equity premium to represent the actual risk premium for the type of industry that defines the project activity's financing risk and associated cost.

Using a Beta would make it possible to reduce the proportion of CDM activities that actually have a beta of lower than one and reallocate the CDM acceptance for more risky and progressive sectors with a beta more than one. We believe that amending the equity premium calculation to include an industry beta would improve the conservative nature of the equity premium by lowering equity premium industries with a low beta (stable industries). At the same time it would improve the accuracy of the allocation of credits to more forward looking and risky industries which have a higher than 1 industry beta.

Additionally the use of Country Default Spreads excludes the application of this tool for the larger part of Sub Saharan Africa and other host countries[14]. The CDS ratings / spreads are simply not provided by the sources used. We would suggest amending the methodology used to make it possible for the Sub Saharan Africa countries to apply the tool.

Option 4a and 4b include the note: *"The project risk is not included in this equation because project participants can reflect the project specific risk in the cash flow analysis in the investment comparison or benchmark analysis as laid out in the sub-step 2C, paragraph 8 of "Tool for the demonstration and assessment of additionality"".*

Sub-step 2C paragraph 8 reads: "*In calculating the financial/economic indicator, the project's risk can be included through the cash flow pattern, subject to project-specific expectations and assumptions (e.g. insurance premiums can be used in the calculation to reflect specific risk equivalents)."*

Our principle recommendation is that this statement might be technically correct, however we would like to stress that the cash flow adjustments to reflect expected cash flows does not incorporate project risk. To incorporate the risk component in the cash flows and enable matching of the proposed discount rate, one would need to discount the expected cash flows first to represent the project volatility and risk. These capitalized cash flows can then be matched to the proposed discount rate of the investment. Besides making this additionally complex and less transparent, it would still require

[14]See: www.Moodys.com; Damodaran, A., "Applied Corporate Finance" (2010), John Wiley & Sons, USA

the same steps when they would be incorporated in the discount rate. Using insurance premiums, by its nature, do not represent the investment risk, but could provide costs of catastrophic risk or equivalent binary/probabilistic risks. They have no relation with the volatility risk of an investment and its associated cost of capital. Furthermore, it would be not very probable to be able to obtain reasonable quotes for investments in Sub Saharan Africa and other high risk geographical areas to reduce the risk of the cash flows.

Step 6: Corporate tax expense:

We would like to make the EB aware of the possibility to have a pre and post-tax WACC as is conventionally used in other regulated markets, such as Telecom, Energy, Airports and Cable companies. To ensure a correct use of the discount rate it is important to match the cash flows (pre or post corporate tax) with the discount rate. We would suggest not blocking this convention of being able to use both methods. As corporate tax can be optimized on a corporate level, it is of importance to have the ability to discount pretax cash flows with a pre-tax discount rate. Additionally, a position needs to be taken in the WACC tool regarding the handling of corporate tax in pass-through entities for tax purposes[15].

Conclusion

From our perspective, the present tool needs some further development to be in line with the guidelines and spirit of the additionality tool. We have suggested two options in the further development and would be happy to assist in providing more detailed solutions for the tool.

With Kind regards,

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[15] Grabowski, R. and McFadden, W., "Applying the Income Approach to S Corporations and Other 'Pass-Through Entity' Valuations", chapter 5 in Reilly, R. and Schweihs, R., *The Handbook of Business Valuation and Intellectual Property Analysis* (New York, McGraw-Hill (2004)