CLEAN DEVELOPMENT MECHANISM

CDM-MP67-A21

Draft Methodological tool

~~Guidelines on the assessment of~~ Investment analysis

Version 06.0

DRAFT

United Nations
Framework Convention on
Climate Change

COVER NOTE

1. Procedural background

1. At its seventy-fifth meeting, the Board considered the information note "Issues related to the “Guidelines on the assessment of investment analysis", as contained in annex 17 to the report of the 60th meeting of the Meth Panel.[1] The Board requested the Meth Panel to develop further guidance on how the cost of equity should be calculated based on “best financial practices”, including an approach for the application of financial models to determine benchmarks against which projects may be compared (e.g. capital asset pricing model (CAPM)), as well as circumstances under which the application of financial models can be considered appropriate (including but not restricted to the CAPM). The Board further requested the Meth Panel to update the default values in annex A of the "Guidelines on the assessment of investment analysis", taking into account the latest available data.

2. The Meth Panel at its 66th meeting agreed to launch a call for public input on the revised draft. The call was open from 31 March to 21 April 2015; one input was received from the stakeholder.

2. Purpose

3. The draft revision of the guidelines aims to*:*

   (a) Develop further requirements on how the cost of equity shall be calculated based on “best financial practices”, including the conditions under which the application of CAPM can be considered appropriate and how CAPM shall be applied to calculate the cost of equity;

   (b) Update the default values for the cost of equity in Appendix 1;

   (c) Incorporate a clarification issued by the Board (EB73-A08-CLAR)[2];

   (d) Include editorial improvements;

   (e) Reclassify the document from a guideline to a methodological tool and change the title to “Investment analysis”.

3. Key issues and proposed solutions

4. To develop further requirements on “best financial practices”, the Meth Panel agreed to engage an external expert and developed the terms of reference for the consultancy.

   (a) The consultant assessed:

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[1] Available at http://cdm.unfccc.int/Panels/meth/index.html

[2] Clarification on applicability of the "Guidelines on the assessment of investment analysis" available at : http://cdm.unfccc.int/Reference/Guidclarif/index_clarif.html#meth

(i) Five financial models used to determine financial benchmarks, by outlining their pros and cons for project finance and their applicability for CDM. The five models are Gordon Growth Model, Risk Premium models, CAPM, CAPM variant models and Arbitrage Pricing Theory (APT) model, the first three of which have been used by CDM projects.

(ii) Impact of different options for cost of equity benchmarks on selected CDM projects.

(b) The consultant concluded that CAPM or risk premium models[3] with clearer assumptions and more stringent guidance on calculations would produce more robust benchmarks for CDM purposes.

(c) The further requirements for the application of CAPM provided in Section 6.1 of this document are based on the consultant inputs prescribing conditions under which the application of CAPM can be considered appropriate and on how CAPM should be applied to calculate the cost of equity.

5. The default values for cost of equity in Appendix 1 are updated using the latest information on the long term returns of the US treasury bonds and stock market and on the Moody's sovereign ratings, following the same method (i.e risk premium model) that was previously used to develop the existing approved default values. The following adjustments are made:

(a) Geometric means over the specified time period[4] are used instead of arithmetic means, because they are considered to be more appropriate in corporate finance and valuations[5] and to calculate risk premiums if the Treasury bond rate is used as risk-free rate and the expected return over that long time horizon is to be estimated.[6]

(b) For those host countries where Moody's sovereign ratings are not available , country risk premiums are derived using a relationship established between Moody's ratings and multiple macroeconomic factors (Economy & Growth, External Debt, Trade, Health and Environment), instead of deriving the values using a relationship between and country risk premiums Gross National Product per capita and as an explanatory variable alone.

(c) The new sector "carbon capture and storage of CO_2 in geological formations" is included in Group 2 for sectoral adjustment.

[3] It is noted that default values for the cost of equity are derived based on the risk premium model.

[4] For the default values approved in EB61, the risk free rate is based on arithmetic average real return on long term US treasury bond for the period of 1954-2007, and equity risk premium is the arithmetic average of equity returns over USA treasury bond for the period of 1900-2005.

[5] Equity Risk Premiums (ERP): Determinants, Estimation and Implications, the 2015 Edition; Aswath Damodaran; Stern School of Business (page 28)

[6] http://pages.stern.nyu.edu/~adamodar/New_Home_Page/AppldCF/derivn/ch4deriv.html

3.1. Response to public inputs:

6. The public inputs propose to allow “international” CAPM to calculate the cost of equity, in addition to “domestic” CAPM as provided in Section 6.1 of this document. The Panel agreed that international CAPM should not be included for the following reasons:

   (a) The objective of calculating the cost of equity is to set benchmarks for domestic projects, not for projects only financed by international investors; therefore, the domestic CAPM is more appropriate because it reflects drivers for local investment in the sector.

   (b) If the criteria for domestic CAPM cannot be met, the revised guideline includes options to use other approaches, including local lending rates and the default values of equity benchmarks in Appendix 1, which are developed from the US market data and country-risk premiums and follow a comparable approach as the international CAPM).

7. The issue of geometric mean vs. arithmetic mean is also raised. It is has been further clarified in Paragraph 5(a) above.

4. Impacts

8. Application of investment analysis is found to be most common in CDM projects for the purpose of additionality demonstration and baseline identification. At the same time, a generic procedure to calculate cost of equity has led to different interpretations among the stakeholders at times leading to delays at validation/registration stage. In this context, correctly defining which financial models are acceptable in which circumstances, is crucial to ensure the environmental integrity of the CDM.

5. Subsequent work and timelines

9. The Meth Panel recommends that the Board update the default values for the cost of equity in Appendix 1 annually and identify the host countries where the cost of equity may be calculated using CAPM, i.e. where the conditions proposed in Section 6.1 of the revised guidelines can be satisfied.

6. Recommendations to the Board

10. The Meth Panel recommends that the Board adopt this draft revised guideline, to be made effective at the time of the Board’s approval. The Meth Panel also recommends that the Board reclassify the document as a methodological tool.

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1. Introduction

1.1. Background

1. In consideration of issues identified through request for reviews and reviews of requests for registration the CDM Executive Board (hereinafter referred to as the Board) considers it necessary to provide project participants and designated operational entities (DOEs) with ~~guidance~~ requirements on the preparation, presentation and validation of investment analysis.

2. Scope, applicability, and entry into force

2.1. Scope and applicability

2. This ~~general guidance~~ tool is to be considered as a complement to existing ~~materials in this area~~ requirements in approved methodologies and other standards and guidelines including, the “Tool for the demonstration and assessment of additionality”, “Combined tool to identify the baseline scenario and demonstrate additionality” and “Non-binding best practice examples to demonstrate additionality for SSC project activities”. The ~~general guidance~~ tool will be revised as appropriate to reflect the evolution of knowledge and best practice in this area.

2.2. Entry into force

3. The date of entry into force is the date of the publication of the EB 85 meeting report on 24 July 2015.

3. Definitions

4. The definitions contained in the Glossary of CDM terms shall apply.

4. General issues in calculation and presentation

5. ~~**Guidance:**~~ The period of assessment should not be limited to the proposed crediting period of the CDM project activity. Both project IRR and equity IRR calculations ~~shall as a reference~~ should reflect the period of expected operation of the underlying project activity (technical lifetime~~) or ,~~ and if a shorter period than the technical lifetime is chosen, the investment analysis shall be conducted for at least 10 years and include the fair value of the project activity assets at the end of the assessment period. ~~In general a minimum period of 10 years and a maximum of 20 years will be appropriate.~~ The IRR calculation may include the cost of major maintenance and/or rehabilitation if these are expected to be incurred during the period of assessment. ~~Project participants are requested to justify and DOEs are requested to validate the appropriateness of the period of assessment in the context of the underlying project activity, without reference to the proposed CDM crediting period~~.

Rationale: The purpose of undertaking an investment analysis is to determine whether or not the project activity would be financially viable without the incentive of the CDM. The actual project activity is not limited in time to the crediting period being requested.

6. ~~**Guidance:**~~ The fair value of any project activity assets at the end of the assessment period ~~should~~ shall be included as a cash inflow in the final year. The fair value should be calculated in accordance with local accounting regulations where available, or international best practice. It is expected that such fair value calculations will include both the book value of the asset and the reasonable expectation of the potential profit or loss on the realization of the assets.

   Rationale: Net Present Value (NPV) or Internal Rate of Return (IRR) calculations are designed to calculate the return on the cost of investment, in cases where the capital expenditures have not been fully devalued this should be reflected as a cash inflow. Not to apply a residual value would imply that the project must repay the full value of the capital expenditure before the value of this expenditure had been consumed.

7. The discount rate used in the investment comparison shall be determined using the requirements provided for the calculation of the project IRR benchmark.

8. ~~**Guidance:**~~ The weighted average costs of capital (WACC) and the cost of equity provided in Appendix 1 or calculated using Capital Asset Pricing Model (CAPM) are post-tax IRR benchmarks, and investment analysis shall be conducted with post-tax cash flows. Depreciation, and other non-cash items related to the project activity, which have been deducted in estimating gross profits on which tax is calculated, ~~should~~ shall be added back to net profits for the purpose of calculating the financial indicator (e.g. IRR, NPV). Taxation should ~~only~~ be included as an expense in the IRR/NPV calculation ~~in cases where the benchmark or other financial indicator is intended for post-tax comparisons~~.

   Rationale: Depreciation is not an actual expense incurred by the company and as such does not directly affect the financial viability of the project. To treat both the capital cost of the assets and their depreciation as an expense to the project would be a double counting of this cost. ~~Taxation can only be considered a relevant expense if the indicator used for comparison purposes is intended for post-tax comparisons.~~

9. ~~**Guidance:**~~ Input values used in all investment analysis ~~should~~ shall be valid and applicable at the time of the investment decision taken by the project participant. The DOE is therefore expected to validate the timing of the investment decision and the consistency and appropriateness of the input values with this timing. The DOE should also validate that the listed input values have been consistently applied in all calculations.

   Rationale: The use of investment analysis to demonstrate additionality is intended to assess whether or not a reasonable investor would or not decide to proceed with a particular project activity without the benefits of the CDM. This decision will therefore be based on the relevant information available at the time of the investment decision and not information available at an earlier or later point. Any expenditures occurred prior to the decision to proceed with the investment in the project will not impact the final investment decision as such expenses sunk costs which remain unaffected by the decision to proceed or not with a project activity.

10. ~~**Guidance:**~~ In the case of project activities for which implementation ceases after the commencement and where implementation is recommenced due to consideration of the CDM the investment analysis should reflect the economic decision-making context at point of the decision to recommence the project. Therefore capital costs incurred prior to

the revised project activity start date can be reflected as the recoverable value of the assets, which are limited to the potential reuse/resale of tangible assets.[1]

Rationale: At the point of taking a decision to restart implementation of a project as a CDM project activity, the key issue of interest to an investor is the costs and revenues including the incentives from the CDM accruing from continuation of the investment.

11. ~~**Guidance:**~~ Project participants ~~should~~ shall supply spreadsheet versions of all investment analysis. All formulas used in this analysis shall be readable and all relevant cells shall be viewable and unprotected. The spreadsheet will be made available to the ~~Executive~~ Board, UNFCCC secretariat and others contracted to assess the request for registration on behalf of the Board including assigned members of the Registration and Issuance Team. In cases where the project participant does not wish to make such a spreadsheet available to the public an exact read-only or PDF copy shall be provided for general publication. In case the ~~PP~~ project participants wishes to black-out certain elements of the publicly available version, a clear justification for this shall be provided to the ~~UNFCCC~~ secretariat by the DOE when requesting registration.

Rationale: ~~Paragraph 6 of Step 2 of the Tool for the demonstration and assessment of additionality (version 4) requires that~~ Investment analysis shall be presented in a transparent manner, to the extent that the reader can reproduce the results.

5. ~~Specific Guidance on the Calculation~~ Application of ~~Project~~ IRR and Equity IRR

12. ~~**Guidance:**~~ The cost of financing expenditures (i.e. loan repayments and interest) ~~should~~ shall not be included in the calculation of project IRR.

Rationale: The purpose of the project IRR calculation is to determine the viability of the project to service debt. Therefore to include the cost of financing as an expense in this calculation would result in a double counting of this cost in the ultimate analysis.

13. ~~**Guidance:**~~ In the calculation of equity IRR only the portion of investment costs which is financed by equity should be considered as the net cash outflow, the portion of the investment costs which is financed by debt should not be considered a cash outflow.

Rationale: The purpose of the equity IRR calculation is to determine the final return on the initial equity investment. In such calculations cost of servicing debt (interest and principle payments) are considered as costs. Therefore to consider all investment costs to be a cash outflow would double count the cost of debt to the equity investor.

14. ~~**Guidance:** Due to the impact of loan interest on income tax calculations it is recommended that when a project IRR is calculated to demonstrate additionality a pre-tax benchmark be applied. In cases where a post-tax benchmark is applied, the DOE shall ensure actual interest payable is taken into account in the calculation of income tax.~~

[1] Capital expenditures should be included not at the original investment costs but at the market fair value at the point of the decision to proceed with the investment, demonstrating the value through assessments done by chartered specialists.

~~**Rationale:** In general project IRR calculations should be conducted independently of the source of financing. This guideline provides information on how to conduct calculation if a post-tax benchmark is used.~~

6. Selection and Validation of Appropriate Benchmarks

15. ~~**Guidance:** In cases where a benchmark approach is used~~ the applied benchmark shall be appropriate to the type of IRR calculated. Local commercial lending rates or weighted average costs of capital (WACC) are appropriate benchmarks for a project IRR. Required/expected returns on equity are appropriate benchmarks for an equity IRR. Benchmarks supplied by relevant national authorities are also appropriate ~~if the DOE can validate that they are applicable to the project activity and the type of IRR calculation presented~~. The DOE shall validate that the benchmarks used are applicable to the project activity and the type of IRR calculation presented.

$$WACC = r_e \times W_e + r_d \times W_d \times (1 - T_c) \qquad \text{Equation (1)}$$

Where:

r_e	=	Cost of equity (-)
W_a	=	Percentage of financing that is equity (-)
r_d	=	Cost of debt (-)
W_d	=	Percentage of financing that is debt (-)
T_c	=	Corporate tax rate (-)

Rationale: For the same project activity the project IRR and equity IRR will be different, therefore the benchmark shall be appropriate to the type of calculation applied.

16. In situations where an investment analysis is carried out in nominal terms and the available IRR benchmarks are in real terms, project participants shall convert the real term values of benchmarks to nominal values by adding the inflation rate. The inflation rate shall be obtained from the inflation forecast of the central bank of the host country for the duration of the crediting period. If this information is not available, the target inflation rate of the central bank shall be used. If this information is also not available, then the average forecasted inflation rate for the host country published by the IMF (International Monetary Fund World Economic Outlook) or the World Bank for the next five years after the start of the project activity shall be used.

17. ~~**Guidance:**~~ In the cases of projects which could be developed by an entity other than the project participant the benchmark should be based on parameters that are standard in the market. The DOE's validation of the benchmark shall also include its opinion on whether a company-specific benchmark or a benchmark based on parameters that are standard in the market is suitable in the context of the underlying project activity.

Rationale: If the project could be developed by a different entity the unwillingness of one investor to assume the associated risks is not sufficient evidence that the project is additional, as this may be based on the subjective profit expectations of that investor. The applied benchmark must be suitable for the specific proposed project activity. It is not suitable to compare the return of low risk investments with the returns achieved or achievable by higher risk investments.

18. ~~**Guidance:**~~ If there is only one possible project developer, either internal company benchmarks/expected returns may be applied, or the benchmark based on standard conditions in the market may be used. If internal company benchmarks/expected returns are used, it ~~Internal company benchmarks/expected returns (including those used as the expected return on equity in the calculation of a weighted average cost of capital - WACC), should only be applied in cases where there is only one possible project developer and~~ should be demonstrated to have been used for similar projects with similar risks, developed by the same company or, if the company is brand new, would have been used for similar projects in the same sector in the country/region. This shall require as a minimum clear evidence of the resolution by the company's Board and/or shareholders and ~~will~~ require the validating DOE to undertake a thorough assessment of the financial statements of the project developer ~~– including the proposed WACC –~~ to assess the past financial behaviour of the entity during at least the last 3 years in relation to similar projects.

Rationale: ~~Paragraph 4 of~~ The Tool for the demonstration and assessment of additionality (version 7~~3~~) requires that benchmarks should not include the subjective profitability expectations or risk profile of a particular project developer. Note that a company's internal benchmark can be derived in different ways~~, including by using the Capital Asset Pricing Model (CAPM)~~, however, values derived based on such approaches should only be used if the resulting benchmarks were consistently used by the company in the past.

6.1. Cost of equity (expected return on equity) in the market

19. ~~**Guidance:**~~ If the benchmark is based on parameters that are standard in the market, the cost of equity should be determined either by: (a) selecting the values provided in Appendix 1~~A~~; or by (b) calculating the cost of equity using CAPM.[2] ~~best financial practices, based on data sources which can be clearly validated by the DOE, while properly justifying all underlying factors. The values in the table in Appendix A may also be used, as a simple default option, if a company internal benchmark is used.~~ The default values in Appendix 1~~A~~ are based on long term historical returns and therefore may also be applied by projects with a start date prior to the adoption of the default values by the Board.

Rationale: The values in Appendix 1~~A~~ reflect, as an approximate value, the returns on equity expected by the market for different sectors and countries ~~(see details on the calculation of the table further below)~~. The expectation of return depends on conditions of the market that can be modelled, taking into account the history (time series) of the market key variables (explaining variables proper of the technology and/or sector under analysis).

20. ~~**Guidance:**~~ The cost of equity may be calculated using CAPM if all of the following conditions are satisfied, according to the most recent datasets from the World Federation of Exchanges[3] and the Gross Domestic Product (GDP) from the World Bank or UNSTAT[4].

[2] Adjustment to the CAPM or use of other financial models may be proposed through a request of revision of the «Tool for the demonstration and assessment of additionality».

[3] <http://www.world-exchanges.org/statistics>.

[4] <http://data.worldbank.org/indicator/NY.GDP.MKTP.CD>; http://unstats.un.org/unsd/databases.htm

(a) More than 10 years of existence for the stock exchange;

(b) The stock market is representative of the domestic economy, i.e. ratio of stock market capitalization to GDP is in excess of 20 per cent;

(c) The average share turnover ratio over the last calendar year is in excess of 20 per cent;

(d) There is at least three domestic pure players that belong to the same sector as the project[5] to calculate beta with at least 3 years of daily stock market data, and daily values are available;

(e) There are domestic government securities labelled in the domestic currency with maturities over 10 years;

Rationale for the individual conditions above:

(a) For market return, it allows to include relatively recent but quite active stock exchanges.

(b) For market return, this level is relatively low on purpose to ensure that countries that haven't been undergoing multiple waves of privatization but still offer domestic private sector investment opportunities be included.

(c) For market turnover, a ratio in excess of 100 per cent means that a single stock is traded more than once per year / a ratio of 20 per cent means that, on average, one stock out of five changes hands every year.

(d) Minimum information required to calculate beta.

(e) For risk free rate, the maturity of such security should not be significantly lower than the project lifetime.

21. The application of CAPM to calculate the cost of equity shall follow the equation below, and should use official data sources from financial institutions (central banks, stock exchanges, etc.) as preferred choice over third party sources:

$$r_e = r_f + \beta \times (r_m - r_f) \qquad \text{Equation (2)}$$

Where:

r_e	=	Cost of equity (-)
r_f	=	Risk-free rate (-). It shall be based on local sovereign debt and shall have a maturity date close to the project lifetime (at least 10 years) and sufficient liquidity. The latest (rather than the average over a time horizon) sovereign debt data available at the time of the investment decision should be used.

[5] If this data requirement cannot be met, the sector may be defined more broadly, e.g. by extending from the solar PV sector to the renewable energy sector and even to the utilities sector, so that at least three players can be identified.

β	=	Beta (-). The beta shall be calculated as the weighted arithmetic average of the beta of all the pure players that have been in business for at least 3 years and over the longest common lifetime for the companies in the sample of pure players, weighted by the total capitals (i.e. equity and long-term debt) of the pure players. Every pure player that meets the abovementioned criteria and that belongs to the same sector as defined in the previous paragraph shall be accounted for and used in the beta calculation. The individual betas shall be calculated independently without deleveraging by the debt-equity ratios of the pure players.
r_m	=	Expected market return. It shall be calculated using the average of the following three annualized rates of return of stock market for (1) the longest time series available, (2) a 20-year horizon (if existing), and (3) a 10-year horizon (if existing). Daily values shall be used. Should there be multiple stock exchange indices, stock issues for a given company, or sovereign debt issues, the most liquid or most frequently traded one shall be used. For stock market indices, liquidity is assessed with the volume of trading for the component stock issues.

6.2. Cost of debt

22. ~~**Guidance:**~~ If a company's internal benchmark is used for the expected return on equity, the cost of debt should be based on the weighted average cost of debt financing of the legal entity owning the CDM project activity.

    (a) For loans, use the weighted average cost of outstanding long-term debt.

    (b) For bonds, use the weighted average yield of the bonds during the last three months prior to the submission of the CDM-PDD for validation or prior to the investment decision, whichever is earlier. The use of bonds to determine the cost of debt is only appropriate for corporate bonds issued in the host country of the CDM project.

    (c) In cases where the debt finance structure of the project is not yet available (e.g. a letter of intent for debt funding is not available), the cost of debt can be assumed as the commercial lending rate in the country or the yield of a 10 year bond issued by the government of the host country or, if this is not available, the bond with the maturity which is closest to 10 years.

23. The following should be documented in the CDM-PDD:

    (a) for bonds: the key parameters of the bond including the time of maturity, yield, registration issuance in the financial system and set-up in the market;

    (b) for loans from a financial institution: the contract of lending between the financial institution and the legal entity owning the assets of the project activity, or, in absence of the contract, a letter from the bank stating its intention to award the loan and the key terms for the loan;

    (c) for debt financing from a parent company: the transfer of capital to the legal entity, documented with the contract of lending between the parent company and the legal entity owning the assets of the project activity and/or the parameters of the corporate bonds as mentioned above. This latter option is only valid for corporate bonds issued in the host country of the CDM project activity.

Rationale: Interest rates charged on loans are dependent upon a company's specific credit rating. Hence company specific interest rates are only relevant for projects with only one possible project developer.

24. ~~**Guidance:**~~ If the benchmark is based on parameters that are standard in the market, the cost of debt should be calculated as the cost of financing in the capital markets (e.g. commercial lending rates and guarantees required for the country and the type of project activity concerned), based on documented evidence from financial institutions with regard to the cost of debt financing of comparable projects. In cases where such data is not available, use the commercial lending rate in the host country to calculate the cost of debt.

6.3. Weighting of debt and equity

25. ~~**Guidance:**~~ If a company's internal benchmark is used for the expected return on equity, then the percentage of debt financing and equity financing should reflect the long-term debt/equity finance structure of the legal entity owning the assets of the project activity. The percentage should be determined based on the latest balance sheet provided under local fiscal/accounting standards and rules if: (a) the legal entity owning the assets of the project activity has balance sheets audited by a third party within two years prior to the submission of the CDM-PDD for validation; and (b) the accounting books of the legal entity reflect at least the total value of all the assets needed for the project activity. If the debt/equity finance structure is not yet available, 50 per cent debt and 50 per cent equity financing may be assumed as a default.

26. ~~**Guidance:**~~ If the benchmark is based on parameters that are standard in the market, then the typical debt/equity finance structure observed in the sector of the country should be used. If such information is not readily available, 50 per cent debt and 50 per cent equity financing may be assumed as a default.

~~7. Investment comparison analysis and benchmark analysis~~

~~27. **Guidance:** If the proposed baseline scenario leaves the project participant no other choice than to make an investment to supply the same (or substitute) products or services, a benchmark analysis is not appropriate and an investment comparison analysis shall be used. If the alternative to the project activity is the supply of electricity from a grid this is not to be considered an investment and a benchmark approach is considered appropriate.~~

~~**Rationale:** The purpose of an investment analysis in the context of the CDM is to determine whether the project is less financially attractive than at least one alternative in which the project participants could have invested. In cases where the alternative requires investment anyhow and baseline emissions are based on that alternative, the only means of determining that the project activity is less financially attractive than at least one alternative is to conduct an investment comparison analysis. The benchmark approach is therefore suited to circumstances where the baseline does not require investment or is outside the direct control of the project developer, i.e. cases where the choice of the developer is to invest or not to invest.~~

8. Sensitivity analysis

28. **~~Guidance:~~** ~~Only v~~Variables, including the initial investment cost, that constitute more than 20% of either total project costs or total project revenues should be subjected to reasonable variation (all parameters varied need not necessarily be subjected to both negative and positive variations of the same magnitude), and the results of this variation should be presented in the PDD and be reproducible in the associated spreadsheets. Where a DOE considers that a variable which constitute less than 20 per cent has a material impact on the analysis they shall raise a corrective action request to include this variable in the sensitivity analysis.

    Rationale: The initial objective of a sensitivity analysis is to determine in which scenarios the project activity would pass the benchmark or become more favourable than the alternative.

29. **~~Guidance:~~** The DOE should assess in detail whether the range of variations is reasonable in the project context. Past trends may be a guide to determine the reasonable range. As a general point of departure variations in the sensitivity analysis should at least cover a range of +10 per cent and –10 per cent, unless this is not deemed appropriate in the context of the specific project circumstances. In cases where a scenario will result in the project activity passing the benchmark or becoming the most financially attractive alternative the DOE shall provide an assessment of the probability of the occurrence of this scenario in comparison to the likelihood of the assumptions in the presented investment analysis, taking into consideration correlations between the variables as well as the specific socio-economic and policy context of the project activity.

    Rationale: The ultimate objective of the sensitivity analysis is to determine the likelihood of the occurrence of a scenario other than the scenario presented, in order to provide a cross-check on the suitability of the assumptions used in the development of the investment analysis.

Appendix 1. Default values for the expected return on equity

1. The table below provides default values for the approximate expected return on equity for different project types and host countries. The expected return on equity is composed of four elements: (a) a risk free rate of return; (b) an equity risk premium; (c) a risk premium for the host country; and (d) an adjustment factor to reflect the risk of projects in different sectoral scopes. All values are expressed in real terms. Geometric means are used because they are more appropriate in corporate finance and valuations than the arithmetic means.[1]

2. The risk free rate of return is calculated based on the long-term average returns of US treasury bonds. The US stock market is used as a proxy because it has the longest well recorded data for government bonds as well as stocks. A value of ~~3.0~~ 3.4 per cent is used.[2]

3. The equity risk premium is derived from the long-term historical returns on equity in the US market relative to the return of bonds. ~~Arithmetic means are used because they are more appropriate for estimating forward looking equity risk premiums than geometric means.~~ A value of ~~6.5~~ 4.4 per cent is used.[3]

4. The risk premium for the host country is estimated using Moody's rating for the host country as a proxy for this risk[4]. For those countries for which ratings by Moody's are not available, the risk premiums were derived using Predictive Mean Matching method with macroeconomic data from the World Bank related to Economy & Growth, External Debt, Trade, Health and Environment. ~~based on comparisons with countries with similar gross national product per capita. The national product per capita has shown to be one of the key economic determinants which have a strong statistical explanatory power for country credit ratings~~.

5. For the purpose of determining the adjustment factor to reflect the risk of projects in different sectoral scopes, three different project categories are distinguished according to the sectoral scopes used under the CDM:

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[1] Equity Risk Premiums (ERP): Determinants, Estimation and Implications, the 2013 Edition; Aswath Damodaran; Stern School of Business (page 27)

[2] Based on the annualized real return on US government bonds for 1965-2014. Source: Credit Suisse Global Investment Returns Yearbook 2015 (Page 58), downloaded from https://www.credit-suisse.com/ch/en/news-and-expertise/research/credit-suisse-research-institute/publications.html.

[3] Based on the annualized equity premium relative to long-term US government bonds for 1900-2014. Source: Credit Suisse Global Investment Returns Yearbook 2015 (Page 58), downloaded from https://www.credit-suisse.com/ch/en/news-and-expertise/research/credit-suisse-research-institute/publications.html.

[4] Downloaded on 18 March 2015 from http://pages.stern.nyu.edu/~adamodar/New_Home_Page/datafile/ctryprem

(a) Group 1 (Adjustment factor: no adjustment is made for this Group):

1. Energy Industries;

2. Energy Distribution;

3. Energy Demand;

13. Waste handling and disposal;

(b) Group 2 (Adjustment factor: the cost of equity is increased by 1 percentage point for this Group):

4. Manufacturing industries;

5. Chemical Industries;

6. Construction;

7. Transport;

8. Mining/Mineral production;

9. Metal production;

10. Fugitive Emissions from fuels;

11. Fugitive Emissions from production and consumption of halocarbon, and Sulphur hexafluoride;

12. Solvent use;

16. Carbon capture and storage of CO_2 in geological formations;

(c) Group 3 (Adjustment factor: the cost of equity is reduced by 0.5 percentage point for this Group):

14. Afforestation and reforestation;

15. Agriculture.

6. Depending on the country and sector, project participants can select the relevant benchmark value for their proposed CDM project activity. Note that the values are expressed in percentages in real terms.

~~7. In situations where an investment analysis is carried out in nominal terms, project participants can convert the real term values provided in the table below to nominal values by adding the inflation rate. The inflation rate shall be obtained from the inflation forecast of the central bank of the host country for the duration of the crediting period. If this information is not available, the target inflation rate of the central bank shall be used. If this information is also not available, then the average forecasted inflation rate for the host country published by the IMF (International Monetary Fund World Economic Outlook) or the World Bank for the next five years after the start of the project activity shall be used.~~

~~8. The default values for the expected return on equity shown below are calculated after taxes.~~

Table 1. Default values for the expected return on equity

	Moody's Rating for Bonds	Group 1	Group 2	Group 3
Afghanistan	-	14.55	15.55	14.05
Albania	B1	14.55	15.55	14.05
Algeria	-	13.2	14.2	12.7
Andorra	Baa1	10.2	11.2	9.7
Angola	Ba2	12.3	13.3	11.8
Antigua and Barbuda	-	11.55	12.55	11.05
Argentina	Caa1	19.05	20.05	18.55
Armenia	Ba2	12.3	13.3	11.8
Azerbaijan	Baa3	11.1	12.1	10.6
Bahamas	Baa2	10.65	11.65	10.15
Bahrain	Baa2	10.65	11.65	10.15
Bangladesh	Ba3	13.2	14.2	12.7
Barbados	B3	17.55	18.55	17.05
Belize	Caa2	21.3	22.3	20.8
Benin	-	14.55	15.55	14.05
Bhutan	-	13.2	14.2	12.7
Bolivia	Ba3	13.2	14.2	12.7
Bosnia and Herzegovina	B3	17.55	18.55	17.05
Botswana	A2	9.08	10.08	8.58
Brazil	Baa2	10.65	11.65	10.15
Brunei Darussalam	-	8.7	9.7	8.2
Burkina Faso	B3	17.55	18.55	17.05
Burundi	-	14.55	15.55	14.05
Cambodia	B2	16.05	17.05	15.55
Cabo Verde	B2	16.05	17.05	15.55
Cameroon	B2	16.05	17.05	15.55
Central African Republic	-	16.05	17.05	15.55
Chad	-	16.05	17.05	15.55
Chile	Aa3	8.7	9.7	8.2
China	Aa3	8.7	9.7	8.2
Colombia	Baa2	10.65	11.65	10.15

	Moody's Rating for Bonds	Group 1	Group 2	Group 3
Comoros	-	14.55	15.55	14.05
Congo	Ba3	13.2	14.2	12.7
Cook Islands	B1	14.55	15.55	14.05
Costa Rica	Ba1	11.55	12.55	11.05
Cuba	Caa2	21.3	22.3	20.8
Côte d'Ivoire	B1	14.55	15.55	14.05
Democratic People's Republic of Korea	-	14.55	15.55	14.05
Democratic Republic of the Congo	B3	17.55	18.55	17.05
Djibouti	-	14.55	15.55	14.05
Dominica	-	13.2	14.2	12.7
Dominican Republic	B1	14.55	15.55	14.05
Ecuador	B3	17.55	18.55	17.05
Egypt	Caa1	19.05	20.05	18.55
El Salvador	Ba3	13.2	14.2	12.7
Equatorial Guinea	-	10.65	11.65	10.15
Eritrea	-	16.05	17.05	15.55
Ethiopia	B1	14.55	15.55	14.05
Fiji	B1	14.55	15.55	14.05
Gabon	Ba3	13.2	14.2	12.7
Gambia	-	16.05	17.05	15.55
Georgia	Ba3	13.2	14.2	12.7
Ghana	B2	16.05	17.05	15.55
Grenada	-	13.2	14.2	12.7
Guatemala	Ba1	11.55	12.55	11.05
Guinea	-	16.05	17.05	15.55
Guinea-Bissau	-	17.55	18.55	17.05
Guyana	-	14.55	15.55	14.05
Haiti	-	14.55	15.55	14.05
Honduras	B3	17.55	18.55	17.05
India	Baa3	11.1	12.1	10.6
Indonesia	Baa3	11.1	12.1	10.6
Iran (Islamic Republic of)	-	13.2	14.2	12.7
Iraq	-	13.2	14.2	12.7
Israel	A1	8.85	9.85	8.35

	Moody's Rating for Bonds	Group 1	Group 2	Group 3
Jamaica	Caa3	22.8	23.8	22.3
Jordan	B1	14.55	15.55	14.05
Kazakhstan	Baa2	10.65	11.65	10.15
Kenya	B1	14.55	15.55	14.05
Kiribati	-	14.55	15.55	14.05
Kuwait	Aa2	8.55	9.55	8.05
Kyrgyzstan	-	16.05	17.05	15.55
Lao People's Democratic Republic	-	14.55	15.55	14.05
Lebanon	B2	16.05	17.05	15.55
Lesotho	-	14.55	15.55	14.05
Liberia	-	14.55	15.55	14.05
Libya	-	9.08	10.08	8.58
Madagascar	-	16.05	17.05	15.55
Malawi	-	17.55	18.55	17.05
Malaysia	A3	9.6	10.6	9.1
Maldives	-	14.55	15.55	14.05
Mali	-	16.05	17.05	15.55
Marshall Islands	-	11.55	12.55	11.05
Mauritania	-	17.55	18.55	17.05
Mauritius	Baa1	10.2	11.2	9.7
Mexico	A3	9.6	10.6	9.1
Micronesia (Federated States of)	-	14.55	15.55	14.05
Mongolia	B2	16.05	17.05	15.55
Montenegro	Ba3	13.2	14.2	12.7
Morocco	Ba1	11.55	12.55	11.05
Mozambique	B1	14.55	15.55	14.05
Myanmar	-	17.55	18.55	17.05
Namibia	Baa3	11.1	12.1	10.6
Nepal	-	14.55	15.55	14.05
Nicaragua	B3	17.55	18.55	17.05
Niger	-	16.05	17.05	15.55
Nigeria	Ba3	13.2	14.2	12.7
Oman	A1	8.85	9.85	8.35
Pakistan	Caa1	19.05	20.05	18.55

	Moody's Rating for Bonds	Group 1	Group 2	Group 3
Palau	-	19.05	20.05	18.55
Panama	Baa2	10.65	11.65	10.15
Papua New Guinea	B1	14.55	15.55	14.05
Paraguay	Ba2	12.3	13.3	11.8
Peru	A3	9.6	10.6	9.1
Philippines	Baa2	10.65	11.65	10.15
Qatar	Aa2	8.55	9.55	8.05
Republic of Korea	Aa3	8.7	9.7	8.2
Republic of Moldova	B3	17.55	18.55	17.05
Rwanda	B2	16.05	17.05	15.55
Saint Kitts and Nevis	-	14.55	15.55	14.05
Saint Lucia	-	10.65	11.65	10.15
Saint Vincent and the Grenadines	B3	17.55	18.55	17.05
Samoa	-	10.2	11.2	9.7
San Marino	-	7.8	8.8	7.3
Sao Tome and Principe	-	16.05	17.05	15.55
Saudi Arabia	Aa3	8.7	9.7	8.2
Senegal	B1	14.55	15.55	14.05
Serbia	B1	14.55	15.55	14.05
Seychelles	-	10.2	11.2	9.7
Sierra Leone	-	14.55	15.55	14.05
Singapore	Aaa	7.8	8.8	7.3
Solomon Islands	-	14.55	15.55	14.05
Somalia	-	11.55	12.55	11.05
South Africa	Baa2	10.65	11.65	10.15
South Sudan	-	17.55	18.55	17.05
Sri Lanka	B1	14.55	15.55	14.05
Sudan	-	14.55	15.55	14.05
Suriname	Ba3	13.2	14.2	12.7
Swaziland	-	14.55	15.55	14.05
Syrian Arab Republic	-	16.05	17.05	15.55
Tajikistan	-	17.55	18.55	17.05
Thailand	Baa1	10.2	11.2	9.7
The former Yugoslav Republic of Macedonia	Ba3	13.2	14.2	12.7

	Moody's Rating for Bonds	Group 1	Group 2	Group 3
Timor-Leste	-	13.2	14.2	12.7
Togo	-	14.55	15.55	14.05
Tonga	-	14.55	15.55	14.05
Trinidad and Tobago	Baa1	10.2	11.2	9.7
Tunisia	Ba3	13.2	14.2	12.7
Turkmenistan	-	14.55	15.55	14.05
Tuvalu	-	10.65	11.65	10.15
Uganda	B1	14.55	15.55	14.05
United Arab Emirates	Aa2	8.55	9.55	8.05
United Republic of Tanzania	-	17.55	18.55	17.05
Uruguay	Baa2	10.65	11.65	10.15
Uzbekistan	-	14.55	15.55	14.05
Vanuatu	-	16.05	17.05	15.55
Venezuela (Bolivarian Republic of)	Caa1	19.05	20.05	18.55
Viet Nam	B1	14.55	15.55	14.05
Yemen	-	14.55	15.55	14.05
Zambia	B1	14.55	15.55	14.05
Zimbabwe	-	16.05	17.05	15.55

~~-~~	~~Moody's Rating for Bonds~~	~~Group 1~~	~~Group 2~~	~~Group 3~~
~~Afghanistan~~		~~14.5~~	~~15.5~~	~~14~~
~~Albania~~	~~B1~~	~~13~~	~~14~~	~~12.5~~
~~Algeria~~		~~12.9~~	~~13.9~~	~~12.4~~
~~Angola~~	~~B1~~	~~13~~	~~14~~	~~12.5~~
~~Antigua and Barbuda~~		~~10.5~~	~~11.5~~	~~10~~
~~Argentina~~	~~B3~~	~~14.5~~	~~15.5~~	~~14~~
~~Armenia~~	~~Ba2~~	~~12.5~~	~~13.5~~	~~12~~
~~Azerbaijan~~	~~Ba1~~	~~11.2~~	~~12.2~~	~~10.7~~
~~Bahamas~~	~~A3~~	~~10.9~~	~~11.9~~	~~10.4~~
~~Bahrain~~	~~A2~~	~~10.8~~	~~11.8~~	~~10.3~~
~~Bangladesh~~	~~Ba3~~	~~12.75~~	~~13.75~~	~~12.25~~
~~Barbados~~	~~Baa3~~	~~11.75~~	~~12.75~~	~~11.25~~

~~-~~	~~**Moody's Rating for Bonds**~~	~~**Group 1**~~	~~**Group 2**~~	~~**Group 3**~~
~~Belize~~	~~B3~~	~~14.5~~	~~15.5~~	~~14~~
~~Benin~~		~~13.25~~	~~14.25~~	~~12.75~~
~~Bhutan~~		~~13~~	~~14~~	~~12.5~~
~~Bolivia~~	~~B2~~	~~13.75~~	~~14.75~~	~~13.25~~
~~Bosnia and Herzegovina~~	~~B2~~	~~13.75~~	~~14.75~~	~~13.25~~
~~Botswana~~	~~A2~~	~~10.8~~	~~11.8~~	~~10.3~~
~~Brazil~~	~~Baa3~~	~~11.75~~	~~12.75~~	~~11.25~~
~~Brunei Darussalam~~		~~10.5~~	~~11.5~~	~~10~~
~~Burkina Faso~~		~~13.75~~	~~14.75~~	~~13.25~~
~~Burundi~~		~~14.5~~	~~15.5~~	~~14~~
~~Cambodia~~	~~B2~~	~~13.75~~	~~14.75~~	~~13.25~~
~~Cameroon~~		~~13~~	~~14~~	~~12.5~~
~~Cape Verde~~		~~12.9~~	~~13.9~~	~~12.4~~
~~Central African Republic~~		~~14.5~~	~~15.5~~	~~14~~
~~Chad~~		~~13.75~~	~~14.75~~	~~13.25~~
~~Chile~~	~~Aa3~~	~~10.3~~	~~11.3~~	~~9.8~~
~~China~~	~~A1~~	~~10.5~~	~~11.5~~	~~10~~
~~Colombia~~	~~Ba1~~	~~12~~	~~13~~	~~11.5~~
~~Comoros~~		~~13.25~~	~~14.25~~	~~12.75~~
~~Congo~~		~~13~~	~~14~~	~~12.5~~
~~Cook Islands~~		~~9.5~~	~~10.5~~	~~9~~
~~Costa Rica~~	~~Ba1~~	~~12~~	~~13~~	~~11.5~~
~~Cuba~~	~~Caa1~~	~~15.5~~	~~16.5~~	~~15~~
~~Cyprus~~	~~Aa3~~	~~10.3~~	~~11.3~~	~~9.8~~
~~Côte d'Ivoire~~		~~13.25~~	~~14.25~~	~~12.75~~
~~Democratic People's Republic of Korea~~		~~9.5~~	~~10.5~~	~~9~~
~~Democratic Republic of the Congo~~		~~14.5~~	~~15.5~~	~~14~~
~~Djibouti~~		~~13~~	~~14~~	~~12.5~~
~~Dominica~~		~~12.9~~	~~13.9~~	~~12.4~~
~~Dominican Republic~~	~~B2~~	~~13.75~~	~~14.75~~	~~13.25~~
~~Ecuador~~	~~Caa3~~	~~17~~	~~18~~	~~16.5~~
~~Egypt~~	~~Ba1~~	~~12~~	~~13~~	~~11.5~~
~~El Salvador~~	~~Ba1~~	~~12~~	~~13~~	~~11.5~~
~~Equatorial Guinea~~		~~10.5~~	~~11.5~~	~~10~~

~~-~~	~~**Moody's Rating for Bonds**~~	~~**Group 1**~~	~~**Group 2**~~	~~**Group 3**~~
~~Eritrea~~		~~14.5~~	~~15.5~~	~~14~~
~~Ethiopia~~		~~14.5~~	~~15.5~~	~~14~~
~~Fiji~~	~~B1~~	~~13~~	~~14~~	~~12.5~~
~~The former Yugoslav Republic of Macedonia~~		~~12.9~~	~~13.9~~	~~12.4~~
~~Gabon~~		~~11.75~~	~~12.75~~	~~11.25~~
~~Gambia~~		~~13.75~~	~~14.75~~	~~13.25~~
~~Georgia~~		~~12.9~~	~~13.9~~	~~12.4~~
~~Ghana~~		~~13.25~~	~~14.25~~	~~12.75~~
~~Grenada~~		~~11.75~~	~~12.75~~	~~11.25~~
~~Guatemala~~	~~Ba2~~	~~12.5~~	~~13.5~~	~~12~~
~~Guinea~~		~~14.5~~	~~15.5~~	~~14~~
~~Guinea-Bissau~~		~~14.5~~	~~15.5~~	~~14~~
~~Guyana~~		~~13~~	~~14~~	~~12.5~~
~~Haiti~~		~~13~~	~~14~~	~~12.5~~
~~Honduras~~	~~B2~~	~~13.75~~	~~14.75~~	~~13.25~~
~~India~~	~~Baa3~~	~~11.75~~	~~12.75~~	~~11.25~~
~~Indonesia~~	~~Ba2~~	~~12.5~~	~~13.5~~	~~12~~
~~Iran (Islamic Republic of)~~		~~12.9~~	~~13.9~~	~~12.4~~
~~Iraq~~		~~9.5~~	~~10.5~~	~~9~~
~~Israel~~	~~A1~~	~~10.5~~	~~11.5~~	~~10~~
~~Jamaica~~	~~Caa1~~	~~15.5~~	~~16.5~~	~~15~~
~~Jordan~~	~~Ba2~~	~~12.5~~	~~13.5~~	~~12~~
~~Kazakhstan~~	~~Baa2~~	~~11.5~~	~~12.5~~	~~11~~
~~Kenya~~		~~13.25~~	~~14.25~~	~~12.75~~
~~Kiribati~~		~~13~~	~~14~~	~~12.5~~
~~Kuwait~~	~~Aa2~~	~~10.1~~	~~11.1~~	~~9.6~~
~~Kyrgyzstan~~		~~13.25~~	~~14.25~~	~~12.75~~
~~Lao People's Democratic Republic~~		~~13.25~~	~~14.25~~	~~12.75~~
~~Lebanon~~	~~B1~~	~~13~~	~~14~~	~~12.5~~
~~Lesotho~~		~~13.75~~	~~14.75~~	~~13.25~~
~~Liberia~~		~~14.5~~	~~15.5~~	~~14~~
~~Libyan Arab Jamahiriya~~		~~10.5~~	~~11.5~~	~~10~~
~~Madagascar~~		~~13.75~~	~~14.75~~	~~13.25~~
~~Malawi~~		~~14.5~~	~~15.5~~	~~14~~

~~-~~	~~**Moody's Rating for Bonds**~~	~~**Group 1**~~	~~**Group 2**~~	~~**Group 3**~~
~~Malaysia~~	~~A3~~	~~10.9~~	~~11.9~~	~~10.4~~
~~Maldives~~		~~12.9~~	~~13.9~~	~~12.4~~
~~Mali~~		~~13.75~~	~~14.75~~	~~13.25~~
~~Malta~~	~~A1~~	~~10.5~~	~~11.5~~	~~10~~
~~Marshall Islands~~		~~12.9~~	~~13.9~~	~~12.4~~
~~Mauritania~~		~~13.75~~	~~14.75~~	~~13.25~~
~~Mauritius~~	~~Baa2~~	~~11.5~~	~~12.5~~	~~11~~
~~Mexico~~	~~Baa1~~	~~11.2~~	~~12.2~~	~~10.7~~
~~Micronesia (Federated States of)~~		~~13~~	~~14~~	~~12.5~~
~~Mongolia~~	~~B1~~	~~12~~	~~13~~	~~11.5~~
~~Montenegro~~	~~Ba3~~	~~12.75~~	~~13.75~~	~~12.25~~
~~Morocco~~	~~Ba1~~	~~12~~	~~13~~	~~11.5~~
~~Mozambique~~		~~14.5~~	~~15.5~~	~~14~~
~~Myanmar~~		~~9.5~~	~~10.5~~	~~9~~
~~Namibia~~		~~12.9~~	~~13.9~~	~~12.4~~
~~Nauru~~		~~9.5~~	~~10.5~~	~~9~~
~~Nepal~~		~~14.5~~	~~15.5~~	~~14~~
~~Nicaragua~~	~~Caa1~~	~~15.5~~	~~16.5~~	~~15~~
~~Niger~~		~~14.5~~	~~15.5~~	~~14~~
~~Nigeria~~		~~13~~	~~14~~	~~12.5~~
~~Niue~~		~~9.5~~	~~10.5~~	~~9~~
~~Oman~~		~~10.5~~	~~11.5~~	~~10~~
~~Pakistan~~	~~B3~~	~~14.5~~	~~15.5~~	~~14~~
~~Palau~~		~~11.75~~	~~12.75~~	~~11.25~~
~~Panama~~	~~Ba1~~	~~12~~	~~13~~	~~11.5~~
~~Papua New Guinea~~	~~B1~~	~~13~~	~~14~~	~~12.5~~
~~Paraguay~~	~~B3~~	~~14.5~~	~~15.5~~	~~14~~
~~Peru~~	~~Baa3~~	~~11.75~~	~~12.75~~	~~11.25~~
~~Philippines~~	~~Ba3~~	~~12.75~~	~~13.75~~	~~12.25~~
~~Qatar~~	~~Aa2~~	~~10.1~~	~~11.1~~	~~9.6~~
~~Republic of Korea~~	~~A2~~	~~10.8~~	~~11.8~~	~~10.3~~
~~Republic of Moldova~~	~~WR~~	~~9.5~~	~~10.5~~	~~9~~
~~Rwanda~~		~~13.75~~	~~14.75~~	~~13.25~~
~~Saint Kitts and Nevis~~		~~10.5~~	~~11.5~~	~~10~~

~~-~~	~~**Moody's Rating for Bonds**~~	~~**Group 1**~~	~~**Group 2**~~	~~**Group 3**~~
~~Saint Lucia~~		~~9.5~~	~~10.5~~	~~9~~
~~Saint Vincent and the Grenadines~~		~~11.75~~	~~12.75~~	~~11.25~~
~~Samoa~~		~~13~~	~~14~~	~~12.5~~
~~San Marino~~		~~10.5~~	~~11.5~~	~~10~~
~~Sao Tome and Principe~~		~~13~~	~~14~~	~~12.5~~
~~Saudi Arabia~~	~~Aa3~~	~~10.3~~	~~11.3~~	~~9.8~~
~~Senegal~~		~~13.25~~	~~14.25~~	~~12.75~~
~~Serbia~~		~~11.75~~	~~12.75~~	~~11.25~~
~~Seychelles~~		~~10.5~~	~~11.5~~	~~10~~
~~Sierra Leone~~		~~14.5~~	~~15.5~~	~~14~~
~~Singapore~~		~~10.5~~	~~11.5~~	~~10~~
~~Solomon Islands~~		~~13.25~~	~~14.25~~	~~12.75~~
~~Somalia~~		~~9.5~~	~~10.5~~	~~9~~
~~South Africa~~	~~A3~~	~~10.9~~	~~11.9~~	~~10.4~~
~~Sri Lanka~~		~~13~~	~~14~~	~~12.5~~
~~Sudan~~		~~13~~	~~14~~	~~12.5~~
~~Suriname~~	~~B1~~	~~13~~	~~14~~	~~12.5~~
~~Swaziland~~		~~12.9~~	~~13.9~~	~~12.4~~
~~Syrian Arab Republic~~		~~12.9~~	~~13.9~~	~~12.4~~
~~Tajikistan~~		~~13.75~~	~~14.75~~	~~13.25~~
~~Thailand~~	~~Baa1~~	~~11.2~~	~~12.2~~	~~10.7~~
~~Timor-Leste~~		~~12.9~~	~~13.9~~	~~12.4~~
~~Togo~~		~~13.75~~	~~14.75~~	~~13.25~~
~~Tonga~~		~~12.9~~	~~13.9~~	~~12.4~~
~~Trinidad and Tobago~~	~~Baa1~~	~~11.2~~	~~12.2~~	~~10.7~~
~~Tunisia~~	~~Baa2~~	~~11.5~~	~~12.5~~	~~11~~
~~Turkmenistan~~	~~B2~~	~~13.75~~	~~14.75~~	~~13.25~~
~~Tuvalu~~		~~9.5~~	~~10.5~~	~~9~~
~~Uganda~~		~~13.75~~	~~14.75~~	~~13.25~~
~~United Arab Emirates~~	~~Aa2~~	~~10.1~~	~~11.1~~	~~9.6~~
~~United Republic of Tanzania~~		~~13.75~~	~~14.75~~	~~13.25~~
~~Uruguay~~	~~Ba3~~	~~12.75~~	~~13.75~~	~~12.25~~
~~Uzbekistan~~		~~13.25~~	~~14.25~~	~~12.75~~
~~Vanuatu~~		~~13~~	~~14~~	~~12.5~~

~~-~~	~~**Moody's Rating for Bonds**~~	~~**Group 1**~~	~~**Group 2**~~	~~**Group 3**~~
~~Venezuela (Bolivarian Republic of)~~	~~B2~~	~~13.75~~	~~14.75~~	~~13.25~~
~~Viet Nam~~	~~Ba3~~	~~12.75~~	~~13.75~~	~~12.25~~
~~Yemen~~		~~13.25~~	~~14.25~~	~~12.75~~
~~Zambia~~		~~13.25~~	~~14.25~~	~~12.75~~
~~Zimbabwe~~		~~13.25~~	~~14.25~~	~~12.75~~

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Document information

Version	*Date*	*Description*
06.0	1 July 2015	MP 67, Annex 21 To be considered by the Board at EB85. This draft revised guideline was available for public input from 31 March to 21 April 2015. It received one input. Revision to: • Describe the conditions under which the application of capital asset pricing model (CAPM) can be considered appropriate; • Provide guidance on how CAPM should be applied to calculate the cost of equity; • Update the default values for the cost of equity in appendix A; • Incorporate a clarification issued by the Board (EB73-A08-CLAR); • Include other editorial improvements; • Change the title to "Methodological tool: investment analysis".
05.0	15 July 2011	EB 62, Annex 5 The revision clarifies that: • In situations where an investment analysis is carried out in nominal terms, project participants can convert the real term values provided in the table in the appendix to nominal values by adding the inflation rate; • The default values for the expected return on equity showed in the table in the appendix are calculated after taxes.
04.0	3 June 2011	EB 61, Annex 13 The revision provides further guidance on the calculation of the expected return on equity, the cost of debt and the percentage of equity and debt funding. The revision also includes a new Appendix with default values for the expected return on equity.
03.1	15 January 2010	EB 51, Annex 58

Version	*Date*	*Description*
		Editorial changes.
03.0	04 December 2009	EB 51, Annex 58 Revision to provide guidance on the treatment of interest payments in income tax calculations.
02.1	02 August 2008	EB 41, Annex 45 Revision to insert annex number.
02.0	02 August 2008	EB 41, Annex 45 Revision to provide guidance on the treatment of costs incurred prior to the project activity start date.
01.0	16 May 2008	EB 39, Annex 35 Initial adoption.

Decision Class: Regulatory
Document Type: Guideline
Business Function: Registration, Methodology
Keywords: barrier analysis, investment aspects