MARC RATING METHODOLOGY (EXPOSURE DRAFT)

RATING APPROACH FOR ISSUANCES SUPPORTED BY THIRD-PARTY CREDIT GUARANTEES

OVERVIEW

This criteria describes MARC's updated approach for analysing obligations that are fully guaranteed by a third party. The criteria also outlines the rating agency's approach to rating issuances backed by partial credit guarantees (PCG).

The criteria does not differentiate between guarantees and bond insurance, the purpose of which is to insure the bond investor against obligor default risk. The concepts in this criteria report will also be applicable to other third-party risk mitigation instruments such as contingent credit lines which effectively function like a guarantee.

The proposed criteria builds on the existing cornerstones of our ratings analysis. Ratings assigned by MARC to obligations that are supported by full guarantees will continue to be rated on the basis of timely payment of interest or profit on and principal of the obligation. Credit ratings on obligations supported by PCG will, instead, reflect the expected loss of the rated obligation. These ratings will factor in both the likelihood of default and the loss severity expected upon default.

MARC's approach to rating issuances backed by full guarantees, PCGs and other third-party credit support mechanisms that approach an effective guarantee is predicated on 'credit substitution'. The credit risk mitigating effect of the full guarantee or PCG is recognised by allowing a guaranteed exposure to be treated as if it were an exposure to a higher-rated guarantor rather than the issuer or ultimate obligor, subject to the guarantee meeting MARC's criteria for credit substitution.

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This document is published as an exposure draft to seek feedback from stakeholders on the proposed methodology used by MARC in its ratings.

Please submit your comments to ratingmethodology@marc.com.my by the indicated deadline below. MARC will publish all comments received during the consultation process (other than unattributed or anonymous comments) and the rating agency's responses at the end of the consultation period.

The feedback received during the consultation period will be taken into account before publishing the methodology in its final form. We encourage non-confidential responses; please indicate if you wish your feedback to be treated as a confidential response.

Deadline for comments: January 15, 2016

MARC's ratings on issuances backed by full guarantees focus on default risk, in particular the credit risk of the third-party guarantor(s). When evaluating such instruments, the credit quality of the issue is considered to be only as good as the weakest link in the credit enhancement where there is more than one provider of credit support and differences exist in their relative creditworthiness. MARC will not be migrating its ratings on issuances backed by full guarantees to an EL-based scale because a strict application of the EL approach would suggest very high instrument ratings on account of the extremely low expected loss given default (LGD) rates. Accordingly, MARC's ratings on fully guaranteed transactions are not expected to change.

In the case of PCGs, MARC will augment its PD ratings with its expectation of LGD to arrive at an expected loss (EL) rating. MARC aims to provide a more comprehensive analysis of the risk mitigation impact of the guarantee or PCG, particularly when their objective is to lower the severity of loss given default rather than reduce default risk or missed payment probability. The PD rating will continue to speak to the probability of full and timely payment to the bondholder until final maturity or such time as the bonds are fully redeemed while the LGD assessment will address recovery at default. This approach is aligned with the regulatory treatment of guarantees in that the risk mitigating effect of the guarantee is recognised by treating the covered exposure as if it were an exposure to the guarantee provider. This is achieved by substituting the probability of default (PD) and LGD of the underlying exposure with that of a higher-rated guarantor for the covered portion of the exposure, the effect of which would be a decrease in the rated security's overall expected loss. The proposed rating approach provides differentiation to investors in PCG-supported obligations with comparable default risk but different recovery prospects.

A bespoke recovery analysis will be undertaken to derive MARC's estimate of LGD in instances where the issuer is assigned a credit rating of B+ or lower. The customised recovery analysis will take into consideration the estimated liquidation value of the enterprise or distressed cash flows as well as the size and ranking of the rated security in the waterfall of claims at default. For higher-rated issuers or obligors, MARC applies standard LGD values which relate seniority, the type and presence of collateral, and jurisdiction to expected loss.

To facilitate implementation of the proposed criteria for PCG-supported issuances, MARC will introduce an EL-based credit-enhanced obligations long-term rating scale that will indicate expected credit loss. Like the existing PD scale, this also measures ordinal credit risk, but with respect to loss severity in the event of default. These EL-based ratings will be identified by an (el) suffix. They are not intended to be comparable to MARC's PD-based ratings. Long-term ratings assigned to issuances backed by third-party full guarantees will continue to carry the (bg) or (fg) suffixes as appropriate. Short-term ratings assigned to issuances backed by full guarantees and PCGs will continue to utilise MARC's existing short-term credit rating scales. Unlike the long-term ratings on PCG-supported issuances, short-term instrument ratings will not factor in the LGD and will continue to address only short-term default risk.

CREDIT GUARANTEES AND PCGs

Guarantees and PCGs are binding commitments to fulfil the obligations of the issuer or ultimate obligor to lender(s) in the event of default of the issuer or borrower. Generally, guarantees and PCGs enable the creditworthiness of guarantors to be leveraged to support public and private borrowers raising financing from the private sector, including through the capital markets. Full or comprehensive guarantees are designed to provide full credit substitution, in contrast to PCGs which provide more limited credit support.

A variety of guarantees can be structured to suit the ultimate obligor's or transaction's requirements, for example, guarantees covering all or only part of principal and/or interest payments on the underlying debt, and rolling guarantees where the guarantee is rolled over to the next guaranteed payment until the expiry of the guarantee agreement if not called.

Guarantees can cover principal and coupon over the life of the obligation on an accelerable or non-accelerable basis. Where the guarantee is non-accelerable, the guarantor would not be liable to pay out the entire guarantee at once. The guarantor makes payment only according to the original debt service schedule under a non-accelerable guarantee. In the domestic context, accelerable full guarantees typically cover the principal and one interest payment, with interest ceasing to accrue upon acceleration.

As compared to full guarantees, PCGs cover only part of the debt obligations. For example, the PCG could cover the final principal repayment, the last few principal and interest payments, a pre-determined portion of debt service during part of the debt's tenure or a pre-determined amount of debt service shortfalls. PCGs can be used as a structuring tool in that the guaranteed coverage may be sized to achieve a target rating. Apart from facilitating the sharing of the bank or corporate issuer's risk between lenders and the guarantor(s), PCGs lower LGD upon a default of the issuer or ultimate obligor.

Rolling guarantees from financial guarantors are mostly PCGs of debt service payments which are conditioned on the ultimate obligor's performance of its payment obligations. In the case of rolling non-reinstatable guarantees, the guarantees will roll over to the next payment only if the guarantee is not called. As for rolling reinstatable guarantees, coverage can only be reinstated following a draw on the guarantee if the obligor successfully reimburses the amounts disbursed under the guarantee within a specified amount of time. Consequently, bondholders backed by rolling guarantees face the risk of holding potentially unsupported bonds and associated rating cliff effects.

Guarantees and PCGs are essentially secondary obligations. They protect lenders and bond investors only in the event there is a default on an obligation. These risk mitigation instruments transfer defined risks from lenders and equity investors to creditworthy third parties such as banks, multilateral agencies and financial guarantee insurers (FGI) that have a better capacity to bear such risks.

Exhibit 1: Guarantee Structure
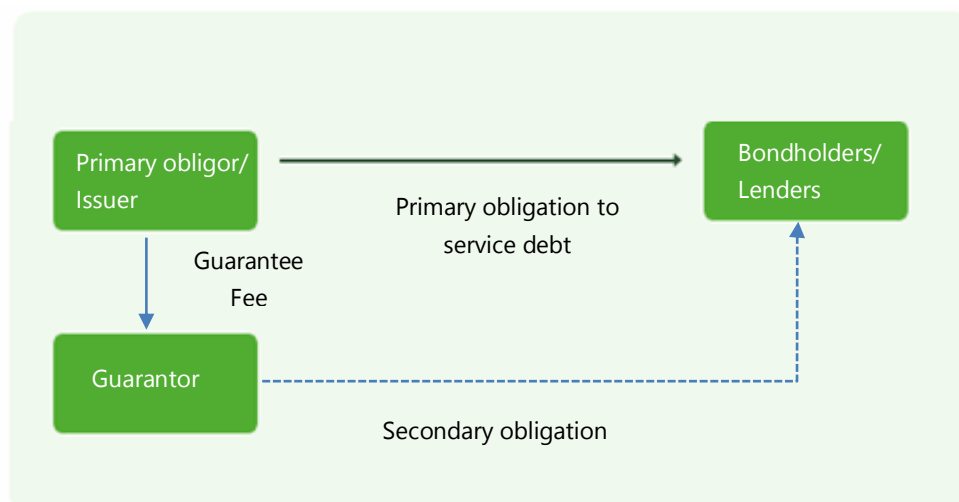
MARC examines the extent of loss coverage and timeliness of the guarantee or PCG (guarantee callable dates) to ascertain the exact nature of the risk mitigation provided, that is, whether it is designed to reduce the rated security's PD or lower its LGD. Any limitations on the amounts, timing and legal enforceability will be taken into account. In cases where the issuer procures guarantee coverage from more than one guarantor, MARC will assess the terms of the guarantee agreement and the arrangement in place to allocate the exposure among the co-guarantors.

MARC'S CRITERIA FOR THIRD-PARTY GUARANTEES

This section sets forth the criteria that the guarantees or PCGs must satisfy before MARC will apply a credit substitution approach in its analysis.

The guarantee or PCG must have the following characteristics:
> be a direct claim of payment (the guarantor agrees to pay if the ultimate obligor defaults);
> be an explicitly or clearly defined documented obligation of the primary obligor;
> be irrevocable, unconditional and unsubordinated (rank pari-passu with the guarantor's senior unsecured obligations). It must not contain clauses whose fulfilment is outside the ultimate obligor's direct control which allow the protection to be cancelled unilaterally or the maturity of the protection to be reduced;
> be payable on the due date;
> the guarantor's right to subrogation is waived until the guaranteed obligations are paid in full;
> the guarantor's rights of set-off, counterclaims, etc. are waived;
> the term of the guarantee would have to match that of the protected exposure;
> the guarantee is binding on successors of the guarantor(s); and
> it must be legally effective and enforceable in all relevant jurisdictions.

MARC'S RATING PROCESS FOR ANALYSING THIRD-PARTY PCGS

The process for analysing third-party PCGs is as follows:

(1) MARC evaluates the third-party guarantee or PCG mechanism to understand its effect on the fully or partially guaranteed obligation. The repayment schedule of the supported obligation is considered in this evaluation.

(2) MARC assesses the credit quality of the issuer or primary obligor and assigns a standalone rating to the issuer or ultimate obligor.

(3) Using its idealised default probability table provided in Appendix D, MARC maps the assigned standalone rating to a PD. MARC's idealised default probability table distinguishes between different forecasting horizons.

(4) MARC estimates the recovery rate or LGD for the unprotected portion of the rated obligation, taking into account the type and seniority of the rated obligation, the capital structure of the issuer or primary obligor's capital, the influence of industry and market-specific factors on recovery levels and the guarantee provider's rights to recovery proceeds of the issuer.

(5) MARC determines the expected loss (EL) rate for the unprotected portion of the obligation using the issuer-specific PDs and LGDs. **(The EL rate is equal to PD times estimated LGD for the appropriate time horizon.)**

(6) MARC undertakes a credit analysis of the guarantor(s) and maps the rating(s) to PD(s) and estimates LGD rates for each counterparty exposure.

(7) MARC derives an exposure-weighted EL rate for the obligation from the expected loss (EL) estimates for the non-guaranteed exposure and each credit-protected exposure (where there is more than one financial guarantor). The size of the PCG provider's guarantee will be measured as a percentage of non-accelerated interest payments and 100% principal. To calculate these percentages, present value calculations will be used where the PCG is not accelerable or the PCG provider covers bonds with principal amortisation. In the case of PCGs, the non-guaranteed or unprotected portion of the obligation is assigned an expected loss rate associated with the ultimate obligor.

(8) MARC compares the exposure-weighted average EL rate with the EL rate associated with the target rating (idealised cumulative expected loss rates) in order to determine whether the guarantee is of sufficient size to support the desired rating. This quantitative analysis is complemented by fundamental cash flow analyses to evaluate cash flows supporting the obligations and potential stress scenarios.

MARC relies on idealised EL to benchmark the expected loss outcome over the life of the obligation and to determine the anchor point for the EL-based rating. The rating that is ultimately assigned by the rating committee may, however, differ from outcomes indicated by the quantitative analysis after incorporating the impact of qualitative considerations. It is believed that in the vast majority of cases, the assigned ratings will not differ by more than one notch from that indicated by the quantitative analysis.

MARC's idealised EL table in Appendix D assumes a 50% LGD to derive EL given the default probability associated with a given rating over a given horizon. Analytical flexibility to vary from the baseline assumption is given to the rating committee mostly to reflect the specifics of a given security or tranche. It is important to note that while the methodology employs cardinal measures of default probability and expected loss to estimate default risk and loss severity upon default, the assigned ratings ultimately represent ordinal rankings of relative credit risk. Hence, it is the relative default probabilities and relative EL rates rather than the absolute values that are critical to MARC's quantitative analysis. As a shift in EL estimates can warrant a reconsideration of ratings, MARC will monitor migrations in EL estimates to determine whether such changes are temporary or otherwise. A degree of tolerance will be applied in the course of monitoring assigned ratings to limit undue ratings volatility.

MARC's idealised default probabilities are primarily based on long-run average default probabilities over a mix of conditions. MARC is mindful that historically observed patterns may change during periods of severe stress for the economy and the primary obligor/issuer's business. Also, the future path or progression of economic and market conditions may not precisely mirror conditions observed in the past. Consequently, a high degree of uncertainty is inherent in LGD estimates in respect of which there is also limited empirical support. Given the aforementioned limitations, the approach MARC has taken is to provide transparency around these estimates to enable investors to follow the logic underpinning MARC's underlying assumptions and evaluate the reasonableness of rating outcomes. MARC will carefully review the applicability of key assumptions on an ongoing basis.

JOINTLY SUPPORTED OBLIGATIONS BACKED BY FULL GUARANTEES

MARC's approach to rating obligations that are fully supported by two or more guarantors is predicated on full credit substitution. Where the guarantee is structured on a joint and several basis, each guarantor is independently liable for the full extent of the obligation. MARC will recognise the risk mitigating effect of joint and several guarantees by rating the obligation based on expected losses in the event of default of the strongest guarantor.

Where each guarantor is severally liable only for its own specified obligations and a guarantor is unable to satisfy its obligation, the responsibility does not

pass to the other participating guarantors. MARC's existing approach of rating fully guaranteed obligations on the basis of timely payment will remain unchanged given that investors in these securities expect a high degree of certainty about timely payment. Due to the remote probability of loss associated with protected exposures covered by guarantors with high investment grade ratings ("A" to "AAA"), the expected loss rating framework does not allow for sufficient differentiation between the relative credit quality of these exposures. Hence, MARC will continue to rate jointly supported obligations no higher than the "weakest link", i.e. at the lowest of the guarantors' ratings.

## GUARANTEES AND PCGS IN STRUCTURED AND PROJECT FINANCE

Structured and project finance transactions utilising guarantees and PCGs are not included within the scope of this criteria. In these cases, MARC will continue to rate these transactions in accordance with the relevant project and structured finance criteria. MARC's ratings of structured finance and project finance obligations address their relative vulnerability to default, or put differently, the likelihood that an individual security or tranche will be serviced on time and in full. The cornerstone of MARC's analytical framework for these ratings is timely payment analysis rather than expected loss. Accordingly, MARC's rating approach for guarantees and PCGs in project financing primarily focuses on their potential credit benefit in terms of default protection rather than economic loss reduction. If guarantees are exercisable on a pre-default basis to cover any shortfall in principal or interest due, and are irrevocable, they may contribute to reducing vulnerability to default.

Some multilateral agencies offer PCGs in countries and sectors to make infrastructure projects more bankable. PCGs have been used by emerging market governments and public entities to support their bond offerings. The multilateral agencies may have preferred creditor status or special government-to-government relationships. Although the PCGs may enhance post-default recovery, they may not prevent a default.

STANDBY LC- AND REVOLVING CREDIT FACILITY-SUPPORTED OBLIGATIONS

Standby letters of credit (SBLC) can be used to back corporate and project finance bond issuances. They can be used to guarantee payment of interest and principal to the bond trustee, and are usually relied upon to back medium-term notes (MTN) and longer-term bonds.

Exhibit 2: SBLC-Supported Bond Structure
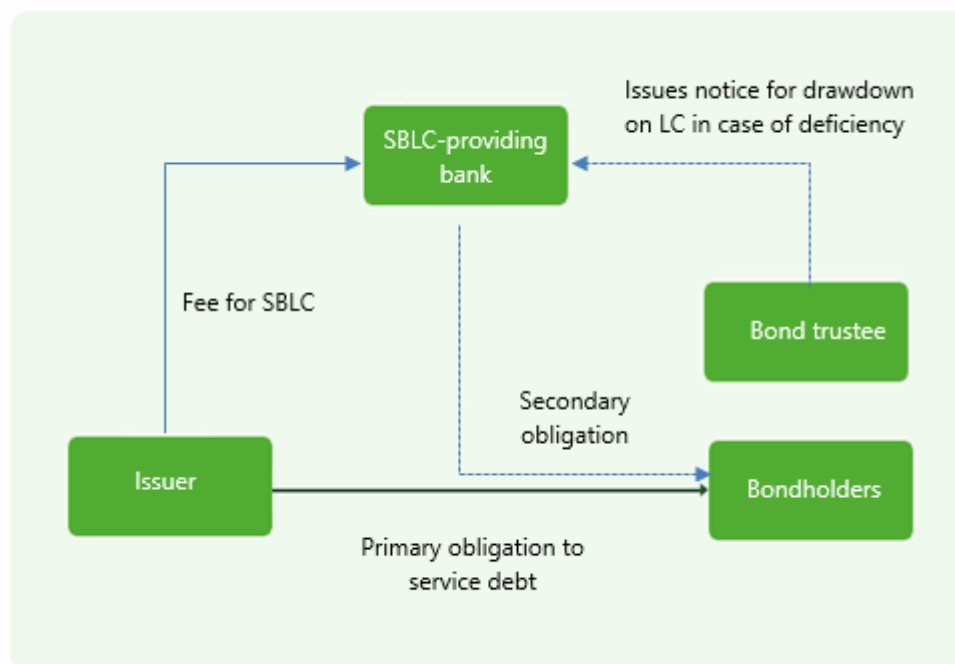
In analysing SBLC-backed transactions in which the purpose of the LC is to provide full credit enhancement of debt service, MARC considers the following factors:

Expiration of the LC

If the LC expires prior to the maturity of the obligation, as is common for transactions with maturities exceeding one year, MARC requires an extension of the LC or a substitute LC that meets the conditions for rating maintenance to be executed prior to the expiration of the existing LC. (In the domestic context, standby LCs typically have a one-year term.) Alternatively, existing bondholders must be taken out via a mandatory redemption.

In transactions where a SBLC or IRC provides 100% of credit support, the SBLC or IRC-backed notes will be rated using the full credit substitution approach.

Terms of the LC

MARC reviews the conditions under which the trustee may draw on the LC, the sizing of LC in relation to principal and interest, and reinstatement terms and provisions pursuant to non-reinstatement of coverage under the LC. The terms of the LC are reviewed alongside the bond documentation to assess

the LC's capacity to provide full and timely payment of principal and interest. The trustee should immediately accelerate the bond maturity upon notification of non-reinstatement of coverage. It is important for the LC to be adequately sized to cover outstanding principal and the maximum amount of interest that can accrue up to the date of acceleration.

MARC will take a similar approach as above in analysing irrevocable revolving credit (IRC) facility-supported obligations. The focus of the rating analysis will be on the IRC's capacity to provide full and timely payment of principal and interest and the nature of permitted non-funding events, if any.

The IRC can protect against the risk of a default by ensuring the issuer has sufficient funds to pay maturing commercial paper (CP) notes. The IRC should be a standby facility that is unconditional and irrevocable, and available for drawdown under all circumstances including timing mismatches between asset payments and CP maturity dates, insufficient proceeds from new CP issuance or disruption in the CP market that prevents new CP issuance.

In transactions where a SBLC or IRC provides 100% of credit support, the SBLC or IRC-backed notes will be rated using the full credit substitution approach. In transactions where a SBLC or IRC provides partial credit support, MARC will consider the liquidity facilities in its assessment of the issuer's liquidity and financial flexibility.

APPROACH TO DETERMINING THE RATING OF PCG-SUPPORTED ISSUES

Guarantee Structure and Payment Mechanism

As with full guarantees, MARC reviews each PCG agreement individually to ensure that the guarantee meets criteria described earlier in this methodology. MARC would also need to satisfy itself that a structured payment mechanism is in place for assuring timely payment of debt service to bondholders. The bond trustee, who acts in a fiduciary role for bondholders, has the responsibility to call upon the guarantee in accordance with its terms. It is important to align the trustee's instructions for invoking the guarantee under the bond indenture with the payment terms of the guarantee. If the guarantor is from a jurisdiction that differs from the applicable law governing the guarantee, MARC will request an opinion from the counsel of the guarantor to confirm the enforceability of the guarantee in the guarantor's jurisdiction.

A variety of PCG structures has been used in emerging markets, such as coverage of principal for bullet maturity bonds or the back-end maturities, coupon and principal guarantees for bullet maturities or amortising bonds, as well as rolling coupon and principal guarantees. Guarantee structures are usually tailored to the specific needs of the issuer or primary obligor.

Other key aspects of the guarantee that will have an important bearing on the assigned rating will be the guarantee coverage, the manner in which the guarantee will be paid out if called (according to original payment schedule or in a lump sum) and the PCG provider's ranking relative to investors of the underlying obligation in recovery.

Issuer and Guarantor Default Analyses

A key component in the analysis of issuances backed by third-party full or partial credit guarantees is assessing the credit quality of the issuer or ultimate obligor. This assessment is identical to the analytical process used to assign issuer or corporate credit ratings. Similarly, MARC takes a qualitative and quantitative approach to analysing the issuer's business and financial risk profiles. MARC's approach to rating corporate issuers is outlined in its criteria reports "Corporate Debt Ratings" and "Corporate Credit: Rating Outcomes Grid".

Where the issuance involves non-domestic issuers and/or non-domestic guarantors, MARC will need to reflect transfer and convertibility risks in their respective PDs, that is, the risk that capital and exchange controls will be imposed by sovereign authorities that would prevent or materially impede their ability to convert local currency into foreign currency. The impact of the sovereign ceiling will be factored into these PDs.

MARC looks to its own ratings in assessing the creditworthiness of a guarantor. Guarantors are typically highly rated; their high credit ratings underpin the value of the credit protection provided to investors. Consequently, a guarantor's probability of failure and associated default risk are usually lower than that of the obligor to facilitate the assignment of a higher rating than would be possible without credit enhancement.

Compared to corporate failures, major bank failures are rare. The low failure rate of financial guarantors is attributed in part to prudential regulation and supervision. Capital rules in recent years have made banking and financial guarantee insurance activities much more capital intensive, which MARC believes would reduce the risk of failure. Given that the choice of resolution strategy would have an important bearing on the likelihood of troubled guarantors defaulting on their guarantee obligations and the losses imposed on different stakeholders, MARC draws comfort from its observation that government-assisted mergers with healthier institutions and capital injections have been the preferred option of the national authorities to deal with troubled institutions. It should be noted that bank deposits are also partially guaranteed by state deposit insurance.

Noting the system's increased propensity for orderly resolution of troubled institutions, MARC views the risk of a domestic SBLC provider, guarantor or financial guarantee insurer defaulting on these counterparty obligations as no higher than the likelihood of default on their respective senior debt obligations

in the event of the institution's failure.

Where the guarantors are non-domestic, MARC will consider the jurisdiction-specific resolution regime for dealing with individual and system-wide banking crises. Where there are meaningful uncertainties regarding the adequacy and effectiveness of a particular regime in resolving a materially distressed or failing financial guarantor, MARC may impose eligibility criteria for guarantors. The principal methodologies used to assess the financial strength of banks and financial guarantee insurers are "Financial Institution Rating" and "Financial Guarantee Insurer Rating Approach" respectively.

Mapping Ratings to Default Probabilities

It should be noted that MARC's proposed approach to quantifying PD excludes the possible favourable effects of imperfect expected correlation between default events for the issuer or ultimate obligor and guarantor. Technically, the default of a guaranteed exposure only occurs if both the issuer and the guarantor default ("double default"), implying that the relevant default probability would be the probability of double defaults or joint default probability. The probability of double default is higher when there is a positive correlation between the credit events of the issuer and guarantor(s) as compared to a situation where the defaults are independent. However, this would still be lower than the individual default probabilities of the issuer/ultimate obligor or the guarantor.

MARC does not attempt to quantify the probability of double defaults under the proposed criteria and the joint likelihood of multiple defaults (where transactions that are guaranteed by more than one guarantor). This is a statistically challenging exercise that greatly increases in complexity when the credit event dependencies of more than two obligors (issuer and multiple financial guarantors) need to be considered. It is reasonable to expect some degree of positive correlation between the default events of the guarantors on account of macroeconomic factors, bilateral interbank exposures and susceptibility to common shocks, amongst others. The agency believes that much further work is necessary to produce credible and reliable estimates of default correlation. Additionally, there is evidence to suggest that correlations increase in times of stress.

Our approach seeks to balance the inherent trade-off between predictive accuracy and complexity. The PDs to which the ratings of the issuer and guarantor are mapped represent lifetime through-the-cycle (TTC) unconditional PDs. As TTC PD estimates, they are less sensitive to changes in economic conditions and more reflective of long-term average PD. Consequently, this would reduce the tendency for ratings to migrate to lower grades in a downturn. The idealised default rates are largely grounded in the historical default experience of the domestic corporate bond market and reflect the historical behaviour of default probability with the passage of time.

Although Malaysia has yet to experience its first "AAA" rated domestic bond default, MARC believes it is prudent to apply non-zero idealised PDs to this rating level for time horizons of four years and above. In the initial years after the rating is assigned, the likelihood of default tends to be highly remote for issuers or guarantors rated at the "AAA" rating level.

MARC will review and revise the idealised default rates as needed to ensure they represent a conservative view of the long-term average of the probability of default associated with each rating level.

LGD Analysis

For PCG-supported issuances, LGDs have to be estimated for both the issuer/ultimate obligor and each guarantor to derive an instrument's exposure weighted average expected loss rating. The LGD is equal to one minus recovery rate in the event of default by a non-financial corporate issuer; in the case of the financial guarantor, it would typically represent loss given resolution. The recovery rate, meanwhile, compares ultimate nominal recovery that is expected to be received at the end of the distress resolution period to principal plus accrued interest at the time of default. MARC's LGD estimates are instrument-specific; they relate to the rated security in the case of the issuer and the guarantee obligation in the case of the financial guarantor.

Historically, MARC has notched down subordinated and hybrid corporate debt ratings from senior unsecured ratings to reflect weaker recovery prospects and higher loss severity for junior debt. Under the proposed criteria, MARC makes further effort to quantify the recovery risk associated with each credit-protected and non-guaranteed corporate exposure. The actual recoveries will generally depend on the seniority of the rated obligation in liquidation or bankruptcy or failure (in the case of guarantor banks and financial guarantee insurer), the expected liability structure of each party at default/failure, and the quality of security, if any.

MARC will assign one of a fixed set of LGD values to corporate exposures of non-financial corporate issuers rated above "B+". MARC proposes to use fixed LGD rates of 50%, 60% or 70% for senior unsecured obligations and 75%, 80% or 85% for subordinated obligations. The underlying premise for introducing an element of informed judgement in LGD estimates as compared to applying a single fixed LGD rate for each of the two debt classes (senior and subordinated) is to support better discrimination between obligations of the same seniority in terms of recovery risk. A wider set of potential LGD drivers may be accommodated in the LGD estimates, including industry sector, structural subordination (holding versus operating company issuer), asset size, country (including default resolution regime), issuer liability structure and financial covenants. The analytical team and rating committee will consider the significance of the aforementioned additional variables on expected loss severity in determining the appropriate LGD rate to be applied.

Exhibit 3: Standard Recovery Assumptions and Loss Rates for "BB- and Above" Non-Financial Corporate Issuers and Financial Guarantors

Obligor Type/Obligation	Applied Recovery Rate Values (%)	Corresponding Loss Rate Values (%)
Non-financial Corporates		
Senior Unsecured Obligations	30%, 40%, 50%	70%, 60%, 50%
Subordinated Obligations	15%, 20%, 25%	85%, 80%, 75%
Banks and Non-Bank Financial Guarantors in relation to guarantee or PCGs		
"AAA" and "AA"	90%	10%
"A"	75%	25%
"BBB"	60%	40%

A margin of conservatism was applied in MARC's selection of the fixed LGD rates given the data limitations. This criteria proposes to apply a LGD floor of 50% for senior unsecured debt obligations and 75% for subordinated debt obligations of non-financial corporates. A LGD floor would also have the effect of limiting the benefit to an EL-based rating of expected high recoveries.

In the case of financial guarantors, the relatively low assumed loss rates for the guarantee obligations relative to corporate exposures reflect MARC's belief that there is a reasonable likelihood that the guarantee obligations of a domestic regulated institution would not be affected or that a guarantee would not be subjected to loss in the event the institution is put into resolution. MARC expects a going concern resolution to be the supervisory authority's most likely resolution strategy for a materially distressed or failing institution, particularly for systemically relevant institutions. (A going concern resolution is one in which the troubled institution is not closed and continues to operate under official administration.)

MARC is mindful that lower assumed PDs and LGDs of financial guarantors (compared to the non-financial corporates) will combine to produce fairly low expected loss given resolution numbers in some cases. The sufficiently remote risk of credit failure and non-performance of a financial guarantor in most cases should mitigate the risk of potential underestimation of loss given resolution estimates for financial guarantors. Over time, as more quality data concerning recovery rates for defaulted bonds and bank obligations becomes available, MARC will increase or reduce these estimates to reflect actual observed data.

At lower rating levels, the likelihood of default in the near to medium term is higher and accordingly, loss expectations become more relevant. For issuers who are near default or are currently in default ("B+" and below), fundamental issuer- and obligation-specific scenario-based recovery analysis will be performed. The bespoke recovery analysis estimates the issuer's post-default going concern or liquidation value.

Recovery Ratings (RR) will be assigned pursuant to the analysis, using the scale below.

Exhibit 4: Recovery Scale for Bespoke Analysis

	Description	Recovery Range (%)
RR1	Very high expectation of recovery	≥90% -100%
RR2	High expectation of recovery	≥70% -90%
RR3	Good expectation of recovery	≥50% -70%
RR4	Average expectation of recovery	≥30% -50%
RR5	Low expectation of recovery	≥10% -30%
RR6	Very low expectation of recovery	≥0% -10%

MARC's recovery expectations will be expressed as a recovery range on a scale with six unequally spaced bands spanning 0% to 100%. The lowest band, RR 6, corresponds to a recovery rate of 0% to 9% and the highest band, RR 1, recovery of 90% to 100%. MARC may reflect the time value of money and an appropriate risk premium in its RRs in its bespoke recovery analyses of issuers who are near default or currently in default ("B+" and below) where the recovery streams are highly uncertain and corporate distress resolution may take an extended period of time.

MARC's bespoke recovery analysis attempts to identify the most likely path to default for the issuer, drawing upon the analysts' understanding of the issuer's business and financial risks. The timing and cause of default, as well as the amount of debt outstanding is anticipated. Next, MARC determines whether the value of the issuer/ultimate obligor is higher if it were reorganised rather than liquidated, based on the issuer's individual circumstances. A liquidation analysis is conducted for issuers with weak business fundamentals and with no reasonable prospects for rehabilitation. The liquidation value typically sets the floor for the issuer's expected enterprise value. Under the liquidation approach, estimates are made of the cash proceeds that might be realised from the liquidation of the enterprise's assets on a fire-sale basis to satisfy the enterprise's outstanding debt and non-debt obligations at default. When assessing the potential recoveries of unsecured senior obligations, MARC will exclude assets pledged to or ring-fenced by other secured issuances.

In valuing the enterprise as a going concern (it is assumed that the business is sold as a going concern), a market (distressed EBITDA multiple) and income (discounted cash flow) approach will likely be used in some combination. For valuations using a distressed EBITDA multiple, care will be exercised to ensure that the value of the multiple reflects the distressed nature of the entity being valued and the corresponding increase in risk to its earnings capacity. Expenses associated with restructuring and other value-enhancing initiative will also be taken into consideration.

A waterfall analysis is used to estimate how much each class of creditor will receive at the end of the entity's reorganisation or liquidation, whichever scenario is assessed to be most appropriate for the bespoke recovery analysis. MARC will assess each obligation's likely recovery level as determined by its relative ranking or position in the liabilities waterfall. Issuers with heavily encumbered balance sheets would be expected to show weaker recovery prospects for their unsecured instruments, possibly LGD levels which correspond to RR5 or RR6. Subordinated and hybrid debt would typically be assigned lower RRs to represent their lower rankings in the legal waterfall. The nature of any subrogation rights given to the PCG provider(s) would be analysed carefully to determine the effects of such rights on noteholders' claims against the issuer's recovery proceeds. Any expected dilution will be taken into account in MARC's recovery assumptions.

Estimating the Security's Expected Loss

The security or transaction's overall expected loss rate is the exposure-weighted EL rate where the weights equal the relative size of the guaranteed and non-guaranteed exposures measured as a percentage of principal balance. The non-guaranteed or unprotected portion of the exposure is assigned an expected loss rate associated with the primary obligor. The exposure-weighted EL rate for the security or tranche is compared with MARC's idealised loss rates for the same investment horizon in order to determine the issue rating. MARC's idealised loss rates are the product of its idealised PDs (from its Idealised Default Probability Table) and an idealised non-financial corporate senior unsecured obligation LGD of 50% which corresponds to the established LGD floor.

To achieve a particular target rating, the exposure-weighted EL rate on the tranche must not exceed the maximum expected loss for the desired rating level corresponding to the expected life of the security.

RATING SURVEILLANCE

Throughout the life of the rated security or tranche, the credit-enhanced obligation ratings will be reviewed on average every 12 months, or where considered appropriate, for example, in the event of a ratings migration at the issuer/primary obligor and/or guarantor level or changes in loss severity expectations which could warrant a change in the ratings. MARC will ensure that underlying assumptions made in the initial analysis remain appropriate and the assigned rating continues to be reflective of the rated obligation's credit risk.

APPENDIX A: SIMPLIFIED APPLICATION OF METHODOLOGY

Example 1: Jointly Supported Bond Backed By Accelerable Full Guarantee

Rating of underlying obligor	BB+
Issue tenure	5 years
Financial guarantors	AAA FGI, AA bank, A+ bank
Proportional guarantee	30:30:40
Guarantee coverage	100% of principal and one interest payment
Bond issue amount	RM100 million
Principal repayment	Bullet
Interest payment	Semi-annually

In the example above, third-party guarantees are used as the primary means of credit protection for the bond issue. Under MARC's timely payment analysis, a weak link approach is taken to translate the credit benefit of the full guarantee to the bonds. According to this approach, the credit quality of the issue is only as good as the weakest link in credit enhancement regardless of the credit strength of the other participating financial guarantors. The bond cannot receive a rating higher than the lowest rating on any third party providing an external guarantee. The rating assigned to the bond cannot exceed the "A+" rating of the bank that is providing 40% of the credit protection in the above example. Consequently, should the third-party guarantor be downgraded, the issue will be correspondingly downgraded.

It should be noted that if the timely payment analysis were to be complemented by an expected loss analysis, the exposure weighted EL rate for the bond can be estimated as follows:

= (.30 x EL for "AAA" guarantor) + (.30 x EL for "AA" guarantor) + (.40 x EL for "A+" guarantor)

= .30 (Five-Year Idealised PD x LGD for "AAA" guarantor) + .30 (Five-Year Idealised PD x LGD for "AA" guarantor) + .40 (Five-Year Idealised PD x LGD for "A+" guarantor)

= .30 (0.0235 x 0.10) + .30 (0.9866 x 0.10) + .40 (6.1597 x 0.25)

= 0.6463%

The EL-based rating indicated by a benchmarking of the estimated 5-year expected loss rate to MARC's idealised expected loss table in Appendix D is "AA-", a notch higher than the "A+" initial rating that MARC would assign using a timely payment analysis.

Example 2: Non-Accelerable PCG for Senior Unsecured Bonds with Bullet Maturity

Rating of underlying obligor	A+
Issue tenure	5 years
Financial guarantor	AAA FGI/bank
Guarantee coverage	Principal in full
Bond issue amount	RM 100 million
Coupon	5.5% fixed
Interest payment	Annual
Principal repayment	Bullet

Partially guaranteed instruments can be decomposed analytically into two components: a guaranteed portion and a non-guaranteed portion. In this example of a non-accelerable PCG, the financial guarantor that has guaranteed the repayment of the principal at maturity on a non-accelerable basis will only make the principal payment on the original scheduled maturity date in the event there is a debt service default.

The present value (PV) of the guarantee is calculated by discounting back the guaranteed bullet repayment five years at an interest rate which reflects the credit risk of the guarantor. The non-guaranteed portion of debt service payments is discounted using an interest rate that is consistent with the standalone credit risk of the issuer. In this example, the equivalent yield to maturity (YTM) for five-year "AAA" and "A+" bonds of 4.33% and 7.10% respectively are used as proxies for those interest rates.

Year	Cash flow to investor RM million	Non-guaranteed debt service	Guaranteed debt service	PV RM million
1	5.5	5.5		5.14
2	5.5	5.5		4.79
3	5.5	5.5		4.48
4	5.5	5.5		4.18
5	15.5	5.5	100.00	84.80*
				103.39

* Includes PV of bullet repayment of RM80.90 million.

The present value of the bullet payment accounts for 78% of the total present value of the bonds' interest payments and the principal. A 50% LGD estimate has been applied to the corporate/underlying obligor exposure.

The exposure-weighted EL rate for the bond will be:
= (.78 x Five-Year EL for "AAA" guarantor) + (.22 x Five-Year EL for the "A+" non-financial corporate*)
= (.78 x 0.0235) + (.22 x 3.0799)
= 0.6959%

The EL-based rating indicated by a benchmarking of the estimated 5-year expected loss rate to MARC's idealised expected loss table in Appendix D is "AA-"

Example 3: PCG for Senior Unsecured Bonds with Partial Redemption Before Maturity

Rating of underlying obligor	A+
Issue tenure	5 years
Financial guarantor	AAA FGI/bank
Guarantee coverage	Debt service in years 4 and 5
Bond issue amount	RM 100 million
Coupon	6.00% fixed
Interest payment	Annual
Principal repayment	50% after 3 years, balance at maturity

In the example above, the PCG covers the final principal repayment of RM50 million at maturity and the last two coupon payments. Note that debt service payments in years 4 and 5 are fully credit-protected by the guarantor. In years 4 and 5, the coupon is paid for half of the nominal amount outstanding subsequent to a partial redemption of RM50 million in year 3.

Year	Cash flow to Investor RM million	Non-guaranteed debt service RM million	Guaranteed debt service RM million	PV RM million
1	6	6		5.60
2	6	6		5.23
3	56	56		45.58
4	3		3	2.53
5	53		53	42.88
				101.82

As in the previous example, we use the equivalent YTM for five-year "AAA" and "A+" bonds of 4.33% and 7.10% respectively to calculate the PVs of the guaranteed and non-guaranteed portions of this partially guaranteed instrument. The present value of the debt service payments in year 4 and year 5 accounts for 45% of the total present value of the bonds' interest payments and the principal. In this example, a 50% LGD estimate has been applied to the corporate/underlying obligor exposure.

The exposure-weighted EL rate for the bond will be:
= (.45 x Five-Year EL for "AAA" guarantor) + (.55 x Five-Year EL for the "A+" non-financial corporate)
= (.45 x 0.0235) + (.55 x 3.0799)
= 1.7045%

The EL-based rating indicated by a benchmarking of the estimated 5-year expected loss rate to MARC's idealised expected loss table in Appendix D is "AA-"

However, it should be noted that the rating of the bonds will subsequently migrate upwards in later periods due to the back-ended nature of the guarantee structure provided the issuer does not default prior to that. Over time, the guarantee provided by the financial guarantor will cover an increasing portion of the remaining debt service payments. Bondholders will take the credit risk of the issuer from year 1 through year 3, and the credit risk of the financial guarantor from year 4 onwards.

Example 4: Arriving at the PCG size for a target rating

Rating of underlying obligor	A-
Issue tenure	5 years
Bond issue	Non-amortising bond
Bond issue amount	RM100 million
Principal repayment	Bullet
Interest payment	Annually, 7.0% per year
Target rating	AA-
Guarantor rating	AAA

Five-year idealised EL for the rating: 1.7866% (5-year PD for "AA-"x LGD of 50%)
Assumed underlying obligor LGD: 50%
Five-year EL for the underlying obligor: 5.8524% (5-year PD for "A-"of 11.70487x LGD of 50%)
Five-year EL for the "AAA" financial guarantor: 0.0235%
Let "X%" be the amount of the PCG required to achieve the target rating, hence
1.7866% = X (0.0235) + (1-X) 5.8524
Solve for X
X= 70% of principal and interest outstanding
This works out to be RM74.9 million for PCG that covers debt service on an accelerable basis (70% of RM7 million annual interest payment and principal of RM100 million).

All the examples above exclude the potential effects of subrogation rights. Where PCGs are written with subrogation rights, overall recovery prospects of bondholders will be diluted. MARC will take this into account in its LGD estimate for the non-guaranteed portion of the rated obligation.

Example 5: A PCG with Other Additional Credit Protection

Rating of underlying obligor	BBB+
Issue tenure	10 years
Financial guarantor	AAA FGI/bank
Guarantee coverage	Debt service payments from year 2 through 10
Debt service reserve account	RM15 million in cash funded from bond proceeds to cover first year debt service.
Bond issue amount	RM 100 million
Coupon	5.00% fixed
Guarantor rating	AAA
Interest payment	Annual
Principal repayment	Equal annual payments starting year 1

In this example, the pre-funded debt service reserve account (DSRA) covers the first debt service payment of RM15 million on the guaranteed bond.

Year	Cashflow to Investor RM million	PV of debt service covered by DSRA RM million	Guarantee coverage available RM million	PV of guarantee coverage available RM million*
1	15.0	15.0		
2	14.5		14.5	13.2
3	14.0		14.0	12.1
4	13.5		13.5	11.2
5	13.0		13.0	10.2
6	12.5		12.5	9.4
7	12.0		12.0	8.6
8	11.5		11.5	7.9
9	11.0		11.0	7.2
10	10.5		10.5	6.5
		15.0		**86.3**

*Assuming the guarantee is non-accelerable. The PV of the guarantee coverage is calculated by using the YTM for a 10-year "AAA-Rated" bond of 4.87% as a proxy for the interest rate that is consistent with the credit risk of the guarantor.

Due to the additional credit protection provided by the pre-funded DSRA (with zero PD and zero LGD), bondholders are fully insulated from the credit risk of the issuer. A PCG from the financial guarantor covering the remaining debt service payments from year 2 through 10, either on an accelerable or non-accelerable basis, would be sufficient to achieve a "AAA(el)" rating. If the guarantee is provided on a non-accelerable basis, it would provide around 85% of the total available credit protection for the bonds on a present value basis; the remaining 15% would be contributed by the DSRA.

APPENDIX B: RATING SCALE APPLICABLE TO INSTRUMENTS RATED ON THE BASIS OF EL

MARC's EL-based long-term ratings are expressed according to a scale ranging from AAA down to the C rating category, with additional "+" and "-" sub-categories from AA to C. These ratings are identified by the "EL" suffix. Long-term EL-based ratings are intended to reflect both probability of default and severity of loss given default of the rated obligation.

LONG-TERM EL-BASED RATING DEFINITIONS

RATING	DEFINITION
AAA(el)	Indicates the highest credit quality and expectation of negligible credit risk.
AA(el)	Indicates very high credit quality and expectations of very low credit risk.
A(el)	Indicates high credit quality and expectations of low credit risk.
BB(el)	Indicates acceptable credit quality and current expectations of low credit risk.
BB(el)	Indicates low credit quality and expectations of high credit risk.
B(el)	Indicates weak credit quality and expectations of very high credit risk. Financial obligations assessed "B" are likely in, or very near default with above average recovery expectations.
C(el)	Indicates very weak credit quality and expectations of extremely high credit risk. Financial obligations assessed "C" are likely in, or very near default with low to average recovery expectations.

Note: Defaulted obligations will not be assigned "D" ratings but are instead rated in the "B" and "C" rating categories depending on their recovery prospects.

APPENDIX C: RECOVERY EXPECTATIONS FOR DEFAULTED PCG-SUPPORTED OBLIGATIONS BY RATING LEVEL

	Expected Recovery Range (%)	Rating of Defaulted PCG-Supported Obligation
RR1	≥90% -100%	B+
RR2	≥70% -90%	B
RR3	≥50% -70%	B-
RR4	≥30% -50%	C+
RR5	≥10% -30%	C
RR6	≥0% -10%	C-

APPENDIX D: IDEALISED DEFAULT PROBABILITY AND EXPECTED LOSS TABLES

Maximum default probability for each rating level and expected life of instrument

Rating	1-year	2-year	3-year	4-year	5-year	6-year	7-year	8-year	9-year	10-year
AAA	0.0000%	0.0000%	0.0000%	0.0114%	0.0235%	0.0539%	0.2183%	0.4513%	0.5967%	0.7570%
AA+	0.0278%	0.0418%	0.0920%	0.3571%	0.7190%	0.9495%	1.0122%	1.0748%	1.1375%	1.2001%
AA	0.0443%	0.0600%	0.1300%	0.4958%	0.9866%	1.3024%	1.3876%	1.4728%	1.5580%	1.6432%
AA-	0.5886%	1.2468%	1.9646%	2.7677%	3.5732%	4.0895%	4.4888%	4.5213%	4.5539%	4.5865%
A+	1.1328%	2.4336%	3.7991%	5.0396%	6.1597%	6.8766%	7.3343%	7.3994%	7.4646%	7.5297%
A	1.6771%	3.6204%	5.6337%	7.3115%	8.7463%	9.6637%	10.1798%	10.2775%	10.3752%	10.4729%
A-	2.7092%	5.1978%	7.4684%	9.5918%	11.7049%	13.4096%	14.4336%	14.6065%	14.7794%	14.9523%
BBB+	3.7413%	6.7753%	9.3030%	11.8721%	14.6635%	17.1555%	18.6873%	18.9354%	19.1836%	19.4317%
BBB	4.7734%	8.3527%	11.1377%	14.1524%	17.6220%	20.9014%	22.9411%	23.2644%	23.5877%	23.9111%
BBB-	12.2848%	16.4499%	20.1461%	23.8340%	27.3943%	30.2637%	32.0484%	32.5063%	32.9643%	33.4222%
BB+	19.7963%	24.5470%	29.1545%	33.5155%	37.1665%	39.6260%	41.1558%	41.7483%	42.3408%	42.9333%
BB	27.3077%	32.6442%	38.1629%	43.1971%	46.9388%	48.9884%	50.2632%	50.9902%	51.7173%	52.4444%
BB-	34.8192%	40.7414%	47.1714%	52.8787%	56.7110%	58.3507%	59.3705%	60.2322%	61.0939%	61.9555%
B+	42.3306%	48.8385%	56.1798%	62.5603%	66.4833%	67.7130%	68.4779%	69.4741%	70.4704%	71.4666%
B	49.8421%	56.9357%	65.1882%	72.2418%	76.2555%	77.0753%	77.5853%	78.7161%	79.8469%	80.9778%
B-	57.3535%	65.0328%	74.1966%	81.9234%	86.0278%	86.4377%	86.6926%	87.9580%	89.2235%	90.4889%
C	64.8650%	73.1300%	83.2050%	91.6050%	95.8000%	95.8000%	95.8000%	100.0000%	100.0000%	100.0000%

Maximum expected loss for each rating level and expected life of instrument

Rating	1-year	2-year	3-year	4-year	5-year	6-year	7-year	8-year	9-year	10-year
AAA	0.0000%	0.0000%	0.0000%	0.0057%	0.0118%	0.0270%	0.2183%	0.2257%	0.2983%	0.3785%
AA+	0.0139%	0.0209%	0.0460%	0.1785%	0.3595%	0.4748%	0.5061%	0.5374%	0.5687%	0.6001%
AA	0.0221%	0.0300%	0.0650%	0.2479%	0.4933%	0.6512%	0.6938%	0.7364%	0.7790%	0.8216%
AA-	0.2943%	0.6234%	0.9823%	1.3839%	1.7866%	2.0447%	2.2444%	2.2607%	2.2769%	2.2932%
A+	0.5664%	1.2168%	1.8996%	2.5198%	3.0799%	3.4383%	3.6672%	3.6997%	3.7323%	3.7648%
A	0.8386%	1.8102%	2.8169%	3.6558%	4.3731%	4.8318%	5.0899%	5.1388%	5.1876%	5.2365%
A-	1.3546%	2.5989%	3.7342%	4.7959%	5.8524%	6.7048%	7.2168%	7.3032%	7.3897%	7.4762%
BBB+	1.8706%	3.3876%	4.6515%	5.9361%	7.3317%	8.5777%	9.3437%	9.4677%	9.5918%	9.7158%
BBB	2.3867%	4.1764%	5.5689%	7.0762%	8.8110%	10.4507%	11.4705%	11.6322%	11.7939%	11.9555%
BBB-	6.1424%	8.2249%	10.0731%	11.9170%	13.6971%	15.1319%	16.0242%	16.2532%	16.4821%	16.7111%
BB+	9.8981%	12.2735%	14.5773%	16.7578%	18.5833%	19.8130%	20.5779%	20.8741%	21.1704%	21.4666%
BB	13.6539%	16.3221%	19.0815%	21.5986%	23.4694%	24.4942%	25.1316%	25.4951%	25.8587%	26.2222%
BB-	17.4096%	20.3707%	23.5857%	26.4393%	28.3555%	29.1753%	29.6853%	30.1161%	30.5469%	30.9778%
B+	21.1653%	24.4193%	28.0899%	31.2801%	33.2416%	33.8565%	34.2389%	34.7371%	35.2352%	35.7333%
B	24.9210%	28.4678%	32.5941%	36.1209%	38.1278%	38.5377%	38.7926%	39.3580%	39.9235%	40.4889%
B-	28.6768%	32.5164%	37.0983%	40.9617%	43.0139%	43.2188%	43.3463%	43.9790%	44.6117%	45.2444%
C	32.4325%	36.5650%	41.6025%	45.8025%	47.9000%	47.9000%	47.9000%	50.0000%	50.0000%	50.0000%

The above idealised default probability table was constructed using published rating agency statistics on realised default rates (grouped by rating category) for domestic corporate bonds from December 1997 to December 2014. The table incorporates certain qualitative adjustments including the smoothing of observed default rates. Linear interpolation was used to derive cumulative default rates at the modifier level. The ratings history data used covers two major stress periods, namely the 1997/98 Asian Financial Crisis and the 2008 Global Financial Crisis.

The volatility of domestic bond ratings in the lower rating categories tends to be higher than that observed for international ratings. This can be attributed to the fairly small number of ratings and also because the rating scales of domestic rating agencies are positioned as national scales. The finer gradations at the lower rating categories make ratings in these categories more sensitive to changes in issuer credit profiles. On the whole, rating transition rates are sufficiently stable for cumulative default rates to be projected into the future.

MARC's own pool of ratings is statistically small; the agency's own data covers the rating histories of 240 long-term credit ratings from December 1997 to December 2014. The obligors include construction and property companies, industrials, utilities, timber and plantation companies, financial holding companies and banks.

To derive horizon-specific idealised expected loss estimates associated with a given rating, a 50% LGD has been applied to the default probabilities in MARC's idealised default probability table. While MARC's idealised default rates are generally consistent with the realised default rates typically observed for corporates over long periods of time, a high level of uncertainty exists as to the likely LGD outcome for the corporate. Although MARC's LGD framework holds the LGD constant at 50%, the potential for meaningful divergence of actual loss rates from EL rates by rating category is acknowledged.

MARC'S ANNUAL CORPORATE DEFAULT RATES BY RATING BAND (2000-2014)

Year	AAA	AA	A	BBB	BB	B	C	High Grade	High Yield	All Corporate
2000	0.0%	0.0%	0.0%	33.3%	0.0%	0.0%	0.0%	0.0%	33.3%	10.0%
2001	0.0%	0.0%	0.0%	50.0%	0.0%	0.0%	0.0%	0.0%	33.3%	4.3%
2002	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
2003	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
2004	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
2005	0.0%	0.0%	4.0%	0.0%	0.0%	0.0%	0.0%	2.8%	0.0%	2.6%
2006	0.0%	0.0%	1.7%	0.0%	0.0%	0.0%	0.0%	1.2%	0.0%	1.1%
2007	0.0%	0.0%	3.3%	33.3%	0.0%	50.0%	0.0%	2.2%	33.3%	4.1%
2008	0.0%	0.0%	1.8%	0.0%	0.0%	0.0%	0.0%	1.1%	0.0%	1.0%
2009	0.0%	0.0%	6.4%	33.3%	0.0%	50.0%	0.0%	3.4%	22.2%	5.1%
2010	0.0%	0.0%	2.9%	0.0%	0.0%	0.0%	0.0%	1.4%	0.0%	1.2%
2011	0.0%	0.0%	3.4%	0.0%	0.0%	33.3%	0.0%	1.4%	12.5%	2.6%
2012	0.0%	0.0%	0.0%	11.1%	0.0%	0.0%	0.0%	0.0%	7.1%	1.3%
2013	0.0%	0.0%	7.1%	0.0%	0.0%	0.0%	0.0%	1.8%	0.0%	1.6%
2014	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%	0.0%	11.1%	1.7%
Arithmetic Mean	0.0%	0.0%	2.0%	10.7%	0.0%	8.9%	6.7%	1.0%	10.2%	2.4%
Standard Deviation	0.0%	0.0%	2.4%	17.4%	0.0%	18.8%	25.8%	1.1%	13.6%	2.6%

Source: MARC Fixed Income Research

MARC'S CUMULATIVE DEFAULT RATES BY RATING BAND (2000-2014)

Rating band	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8
AAA	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
AA	0.0%	0.0%	0.0%	0.4%	0.8%	1.2%	1.6%	1.6%
A	2.5%	5.4%	8.2%	10.1%	11.8%	12.6%	13.0%	13.2%
BBB	8.2%	11.5%	11.5%	13.1%	14.8%	18.0%	19.7%	19.7%
BB	0.0%	4.0%	8.0%	8.0%	8.0%	8.0%	8.0%	8.0%
B & Lower	19.0%	28.0%	28.0%	28.0%	28.0%	28.0%	28.0%	28.0%
High Grade	1.3%	2.9%	4.4%	5.5%	6.5%	7.1%	7.4%	7.5%
High Yield	8.4%	13.1%	14.0%	15.0%	15.9%	17.8%	18.7%	18.7%
All Corporate	2.1%	3.9%	5.4%	6.5%	7.5%	8.2%	8.6%	8.7%

Source: MARC Fixed Income Research