MOODY'S INVESTORS SERVICE

RATING METHODOLOGY

Moody's Approach to Rating Derivative Product Companies

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This rating methodology replaces *Moody's Approach to Rating Derivative Product Companies* published in May 2020. We updated footnote 11 to reflect the consistent treatment of ratings with synthetic CDOs, and we updated footnote 14 to reflect legal developments related to the enforcement of flip clauses. The updates do not change the substantive approach of the methodology.

1. Executive Summary

This document describes our methodology for rating Derivative Product Companies (DPCs). A DPC is a credit enhanced intermediary counterparty acting for its sponsor, typically a major investment or commercial bank. In this role, the DPC primarily transacts in over-the-counter (OTC) interest-rate and foreign exchange derivatives with non-affiliated counterparties.[1, 2]

Based on the methodology and adding qualitative judgments as described in this report, rating committees assign structured finance counterparty ratings to DPCs and also rate debt instruments.[3] A counterparty rating reflects the expected loss associated with a DPC's payment obligations (including both scheduled and termination payments) under derivative contracts with non-affiliated counterparties.

DPCs can issue debt to provide additional capital for credit enhancement on top of capital raised through equity. Our DPC debt ratings address the expected loss posed to investors in DPC debts.

As DPCs are typically complex operating entities, with potential exposure to market risk and complex financial products, we generally do not expect to assign Aaa counterparty or debt ratings, except in certain cases with simple structures and insulation from extreme market risks.

[1] We distinguish here between DPCs, which normally transact in the interest-rate and foreign-exchange derivative markets, and Credit DPCs (CDPCs), which primarily engage in credit derivative transactions.

[2] Non-affiliated counterparties are those counterparties to the DPC that are not affiliated with the DPC, including its sponsor and the sponsor's affiliated entities.

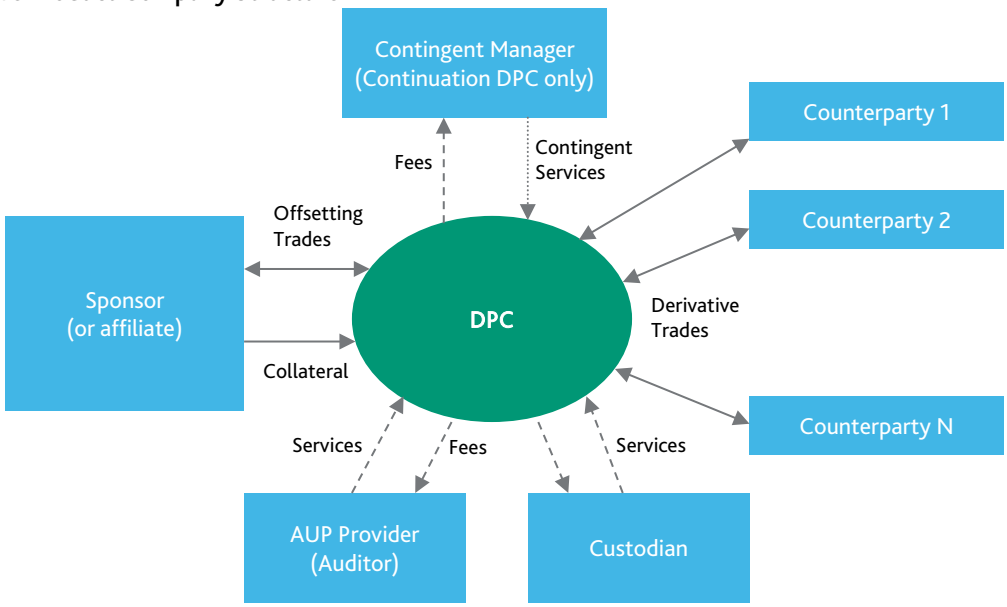
[3] For more details see Moody's Related Publications section, Rating Symbols and Definitions.

In addition to quantitative analysis, our methodology contemplates a qualitative review of each DPC's characteristics, including its legal framework, structural integrity, and operational soundness, the last of which includes the quality of controls available to the DPC in trading derivative products. Rating committees will, where appropriate, consider additional quantitative and qualitative factors they deem relevant.

2. Structure of Derivative Product Companies

DPCs are highly capitalized and collateralized intermediaries with limited permitted activities that insulate non-affiliated counterparties from the risk of default by the DPC's sponsor (see Exhibit 1).[4]

EXHIBIT 1
Derivative Product Company Structure



Source: Moody's Investors Service

2.1. DPC's Governing Documents Define Structure and Limit Activities

The DPC's governing documents define and constrain the entity's activities and operating procedures.[5] These documents typically impose minimum capital and collateral requirements, which if not met, trigger a wind-down or termination (Section 2.3 below) of the DPC. They restrict transactions to a highly specific list of permitted products, as well as counterparties. The documents also impose tight management and risk control procedures, including weekly or monthly agreed-upon-procedure (AUP) letters by an independent auditor that addresses adherence to documents.

[4] The efficacy of such insulation for some DPCs has been called into question by the voluntary bankruptcy filings of two Lehman Brothers DPCs; our approach to analyzing this risk is described in Section 4.3.

[5] As described in Section 4, the key documents generally include the Operating Guidelines, ISDA Master Agreements, Contingent Management Agreements for continuation DPCs, and Security Trust Agreements for DPCs that grant counterparties a first priority security interest.

2.2. DPC's Offsetting Trades

During normal operations, a DPC enters into an offsetting trade with an affiliate of its sponsor against each trade that it executes with a non-affiliated counterparty (see Exhibit 1). Such offsetting trades (or "mirror trades") are identical to the trades with non-affiliated counterparties except that the DPC now takes the opposite side. The offsetting trade protects the DPC against market risk associated with the third-party trade by passing on to the sponsor affiliate any gain or loss that results from the external trade.

All payments under offsetting trades with the sponsor affiliate are typically netted in the same currency. On a daily or weekly basis, these offsetting trades are marked to market and the amount of required collateral to be posted to the DPC by the sponsor affiliate is calculated. Posting of collateral to the DPC secures the obligations of the sponsor affiliate on the offsetting trades.

The offsetting trades eliminate the DPC's market value risk before the occurrence of a trigger event (discussed below), but not its credit risk. The risk of non-payment by the non-affiliated counterparties is still borne by the DPC. Thus, the DPC holds capital against the potential for defaults by such counterparties.

2.3. Trigger Events

The DPC's governing documents, and usually its ISDA Schedules with counterparties, clearly define a set of trigger events. Such trigger events may include the downgrade or bankruptcy of the sponsor or DPC, failure of the sponsor to meet collateral obligations to the DPC after a short cure period, and failure of the DPC to hold sufficient financial resources, again subject to a short cure period.

Upon the occurrence of a trigger event, the DPC will either enter into a gradual wind-down phase (continuation structure) or an immediate termination (termination structure). In either case, all offsetting trades with the sponsor will be terminated within a short period. The DPC will not enter into new trades except, in the wind-down case, certain risk-reducing transactions.

2.4. Termination vs. Continuation Structure

Sponsors structure DPCs as termination or continuation vehicles. Both types operate similarly prior to the occurrence of a trigger event. However, upon the occurrence of a trigger event, the approaches to limiting further risk diverge.

Termination DPCs are required by their operating guidelines to terminate all of their outstanding trades, both with the sponsor affiliates and the non-affiliated counterparties, within a few days of experiencing the trigger event. Then, within a few additional days, the DPC will value and settle all termination receipts and payments with its counterparties.

In contrast, while a continuation DPC also terminates all offsetting trades with its sponsor within a few days of the trigger event, it then continues to make and receive scheduled payments on all trades with non-affiliated counterparties until such time as these trades either mature or are terminated or novated. A third-party contingent or back-up manager (see Exhibit 1) assumes the operations of a continuation DPC that has experienced a trigger event and is charged with, among other tasks, conducting negotiations with non-affiliated counterparties, as well as entering into new offsetting trades where possible.

2.5. Dynamic Collateral and Capital Requirements

Termination and continuation DPCs each terminate all offsetting trades with their sponsor within a few days of a trigger event. To the extent that the sponsor has posted collateral immediately prior to the trigger event, the DPC will liquidate this collateral.

Termination of the offsetting trades with the sponsor exposes the DPC to market risk on its book of trades with non-affiliated entities. The maximum unhedged period for a termination DPC is the short interval between the last actualization of the amount posted under the offsetting trades and the determination of termination amount under offsetting trades and trades with non-affiliated counterparties.[6] A provision for possible market movements during those first few days (and for several additional days as a buffer against potential market disruptions) is typically included in the collateral posted by the sponsor. For a continuation DPC, the collateral posted by its sponsor typically covers a longer period of several weeks' potential market movements to allow the contingent manager time to find replacement hedges for the portfolio.

In order to assess the value of collateral as a mitigant to market risk in the period following the termination of offsetting trades, we review the relevant credit support documentation to determine whether the DPC is obliged to return any excess collateral (i.e. the amount by which the value of posted collateral exceeds the market value of the offsetting swaps at the time they are terminated) to the sponsor. A DPC also holds a model-determined amount of capital against the risk of non-payment by non-affiliated counterparties, although the timing of the risk of non-payment following a trigger event differs between termination and continuation vehicles. For termination DPCs, capital offsets potential non-payment of mark-to-market-based termination payments that are contractually required to be made by non-affiliated counterparties soon after a trigger event. For continuation DPCs, capital offsets potential termination payments or non-payment by non-affiliated counterparties of periodic payments that are scheduled to occur over the life of each third-party trade, if a DPC chooses to keep such trade in place until maturity. Capital may also offset defaults by non-affiliated counterparties while both termination and continuation DPCs are in normal operating mode.

Capital and collateral requirements are both recalculated on at least a weekly basis and, if there is a shortfall in either required capital or collateral, additional amounts are provided to the DPC by the sponsor or its affiliate within a very tight cure period. Failure to cure a shortfall constitutes a trigger event.

3. Assessing a DPC's Financial Capacity

We divide a DPC's financial resources into capital, used to cover potential losses from non-affiliated counterparty defaults, and collateral, which is in place to cover potential losses arising from a change in value of a DPC's trades should a trigger event occur. We assess the capital and collateral adequacy of a DPC by using a quantitative model (capital model), where appropriate, which is typically provided by the DPC's sponsor.[7] We review a detailed technical description of the capital model for consistency with our analysis of risks to determine the model's suitability for determining capital adequacy. DPCs normally incorporate this description, directly or by reference, into the governing documents. An independent auditor verifies the capital model for consistency with the detailed technical description.

Capital and collateral are not fungible. Though capital can be used to meet any obligation of the DPC, collateral is generally posted under an ISDA Master Agreement and only applies to the obligations that arise within that agreement. Thus, the collateral that the sponsor posts can only be used to satisfy what would otherwise be a failure by the sponsor to fully meet its obligations to the DPC under the ISDA Master Agreement between the two entities. Similarly, collateral posted by or to the DPC under ISDA Master Agreements with third parties can only be applied to obligations arising within such agreements. Any excess

[6] Following an unwind event in a termination DPC, termination amounts of offsetting trades and non-affiliated counterparties trades are usually documented to be determined at the same time on the same day. The intent is to greatly reduce the risk of a material difference between termination amounts determined under non-affiliated counterparty trades and under offsetting trades.

[7] We may, in the course of reviewing a model over time, determine that a DPC's capital model is no longer consistent with our assumptions. We would then use alternative methods to determine capital adequacy, such as comparability analysis, use of other risk measurement statistics, and our own modeling of the DPC's risk.

collateral that remains after the settlement of all transactions under a Master Agreement must be returned to the party that posted it.

3.1. Capital Adequacy

In this section, we consider the role and sizing of required capital. In particular, we discuss the need for capital, the consequence of a capital shortfall and the calculation of required capital, including certain add-on amounts.

The DPC's sponsor affiliate enters into trades with a DPC to offset all trades with non-affiliated counterparties on a net basis but does not guarantee the performance of the DPC's counterparties. Should a non-affiliated counterparty default and the trades with the counterparty are in the money from the DPC's perspective, the DPC may not receive the full termination amount due under the trade. Consequently, the DPC may not receive sufficient funds to terminate the corresponding offsetting trade with the DPC sponsor. Capital is therefore required to cover any losses arising from such a counterparty default.

A DPC sizes its capital requirements using a combination of a capital model, minimum capital override, and additional capital charges, the adequacy of which we evaluate in our credit analysis.

The capital model is commonly a simulation model that calculates the amount of capital required to ensure model estimated expected loss caused by counterparty defaults stays below targeted thresholds. To avoid over-reliance on the capital model, DPCs calculate an alternative capital requirement, based on a set of minimum capital rules. For example, a DPC may capitalize itself to cover the credit loss as a result of simultaneous defaults of a number of largest counterparties by exposure and by rating. Although the possibility of such event is likely to be remote, such tail risk may be underestimated in a parameterized model. Finally, additional capital charges may be added in respect of so-called 'exotic' trades (see further discussion in Section 3.1.5.1).

A failure to satisfy a DPC's capital requirement is normally a trigger event, requiring either termination of all trades or a gradual wind-down under the supervision of a contingent manager. Satisfaction of this capital requirement will typically also produce stability in the DPC's counterparty rating. However, it is possible that the rating may change even if the DPC satisfies the capital requirement defined in its governing documents due to changes in the market and the legal environment, or changes in the status of the DPC's sponsor, such as its rating or insolvency.

Capital generally takes the form of highly liquid, low-risk assets. Investment eligible to meet the capital requirements are specified in the DPC's governing documents. Such eligible investments typically include short-term government obligations, deposits at P-1-rated banks and similar instruments. In some cases, haircuts may be applied to the instruments in which capital is invested to address market value risk.[8]

3.1.1. A Simulation Approach

We describe here the key characteristics of a comprehensive model for the computation of capital consistent with a target counterparty rating. We will take into consideration the consistency of the actual capital model with these characteristics in determining a DPC's rating.

As discussed in Section 2.5, a DPC requires capital to mitigate the risk of payment default by non-affiliated counterparties. The capital model, used by the DPC to size the amount of capital required for this purpose, is usually implemented in a simulation framework. The model generates multiple economic paths, each

[8] For example, haircuts derived from the current methodology for market value collateralized loan obligations (MV CLOs) may be applicable. A link to a list of our sector and cross-sector methodologies can be found in the "Moody's Related Publications" section.

representing a possible evolution of market variables (interest rates, exchange rates, etc.), as well as simulated non-affiliated counterparty defaults, assuming a trigger event has occurred.[9] At each time interval along a path, the market values of all outstanding trades, total payables, and total non-defaulted receivables of the DPC are calculated (for a termination DPC, only the next period is relevant). For the purpose of assessing capital adequacy, we assume that, in accordance with its obligations under the DPC's documentations, the sponsor affiliate has fully collateralized the offsetting trades and therefore the DPC has no exposure to its sponsor.

A simulation-based capital model will need to use certain correlation and default assumptions to simulate defaults. We use the correlation and default parameters generated by a multifactor Gaussian copula simulation model as implemented in the then current version of Moody's CDOROM™ as benchmark for reviewing the relevant assumptions of a DPC's capital model.[10] In the Gaussian simulation model, the probability of default for each counterparty is linked to our rating or credit estimate for that counterparty,[11] and the default correlations used depend on our industry and region classifications for each counterparty.

The relationship between rating, tenor and the idealized default probability is provided in our idealized default rates.[12] If a counterparty does not have a Moody's counterparty, financial strength or issuer rating or a credit estimate,[13] we may assume a high default probability for such a counterparty and assess the sensitivity of the DPC's rating to this assumption. The conservativeness of our default probability assumption is determined on a case-by-case basis, depending on such factors as the counterparty rating of the DPC and the business nature of the counterparty. Furthermore, some DPCs transact with special purpose vehicles (SPVs) that are set up for asset securitization transactions. These SPVs are typically not rated. For the purpose of calculating the amount of capital required to mitigate the risk of non-payment by a SPV, the modeled default probability of the SPV is derived from the rating of the SPV's debt immediately below the swap termination payment in the waterfall in the event of the SPV's default. In addition, in a situation where the SPV defaults under the swap with the DPC, we assume the potential termination payments due to the DPC from the SPV are not paid.[14]

A DPC's capital requirement is affected by many factors. In general, a DPC's capital requirement will be higher when:

» The ratings of the DPC's non-affiliated counterparties are lower,

» Diversification across counterparties is less extensive (i.e., higher default correlation and obligor concentration),

[9] It is assumed that a trigger event has occurred because the purpose of the capital model is for a DPC to test for capital adequacy, which if failed, results in a trigger event. Thus, if the test fails, then the assumption is borne out, making the assumption valid for the purpose of the test.

[10] For benchmark parameters, please see our methodologies relevant for the type of non-affiliated counterparties facing the DPC. For example, asset correlation parameters for corporate counterparties (respectively Structured Finance counterparties) can be found in the methodology for corporate synthetic collateralized debt obligations (CDOs). A link to a list of our sector and cross-sector methodologies can be found in the "Moody's Related Publications" section.

[11] Consistent with our approach to rating synthetic CDOs, obligors with a negative rating outlook are treated as if their ratings are one notch below their actual Moody's ratings. Obligors on review for downgrade are treated as if their ratings are two notches below their current Moody's ratings, while those on review for upgrade are treated as if their ratings are one notch higher.

[12] For more information, see *Rating Symbols and Definitions.* A link can be found in the "Moody's Related Publications" section.

[13] For our approach to the usage of credit estimates, a link to a list of our sector and cross-sector methodologies can be found in the in "Moody's Related Publications" section.

[14] (i) In the case of a DPC in default, its insolvency following an uncured exhaustion of available capital will trigger an unwind of all trades. When the trades are conducted with a structured finance SPV, any swap termination payments due by the SPV would typically be paid at the bottom of the waterfall because of a "flip clause". We generally assume flip clauses are enforceable and that SPVs will be unable to honor subordinated termination payments, hence our modeling assumption of no payment made to the DPC in this case.

(ii) In the case of a SPV in default, the priority of a swap termination payment potentially due to the DPC by the SPV is very high in the waterfall, typically senior to all the debts issued by the SPV. We model the probability of the DPC not being paid under the swap in line with the rating of the most senior tranche immediately below the swap payment in the waterfall. In terms of severity, we keep the assumption of no payment, assuming that a SPV that cannot repay a cent of its entire rated capital structure will likely not be able to repay a swap termination payment senior to it.

» The exposures to the products in the DPC's derivative portfolio are greater (e.g., long-term currency swaps vs. short-term interest-rate swaps),

» Un-netted exposures across all transactions with a particular counterparty are higher, and

» The interval over which the DPC is exposed to third-party default risk is longer.

3.1.2. Calculating a Loss Ratio

Since the DPC is structured to be market-neutral, it should be able to meet all its obligations even without any capital as long as no counterparty defaults.[15] If over any time interval along a simulated economic path, defaults occur and the DPC has insufficient capital to cover defaulted receivables, the DPC will not be able to meet its obligations. That means that non-defaulting, in-the-money, non-affiliated counterparties in aggregate will not receive the full contractual payments from the DPC, with a loss ratio of:[16]

FORMULA 1

$$Loss\ Ratio = \frac{PV\ of\ [Payables - (Available\ Capital + Non - defaulted\ Receivables)]}{PV\ of\ Payables}$$

Source: Moody's Investors Service

This fraction is the average share that cannot be paid to each of those non-defaulting, in-the-money, non-affiliated counterparties to which the DPC owes money.

Where a DPC issues debt, the loss ratio is essentially the same as in the Formula, but here 'Payables' in the Formula above represent the contractual interest and principal payments and capital is adjusted to reflect payment of senior obligations, if any. The calculation must, of course, take account of the seniority of the DPC's debt. In cases where DPC has issued debt, the related obligations have been junior to counterparty obligations.

For termination DPCs, the application of the Formula above is straightforward because the relevant cash flows occur in a single period. That is, the relevant measures of payables and receivables are the net termination values, as determined by the DPC. If obligations cannot be met in full, all non-defaulting, in-the-money, non-affiliated counterparties incur the same *pro rata* loss.

For continuation DPCs, the capital model simulates all cash flows to and from the DPC until either the final transaction matures or the DPC runs out of capital.[17] If the book runs off without any capital shortfall, the loss to counterparties is zero. If, at some point, the DPC's resources are insufficient to meet its obligations, a loss will ensue. In the period in which the DPC cannot meet its obligations, the loss ratio is calculated using the Formula above where 'Payables' and 'Receivables' represent the negative and positive mark-to-market values, respectively, of the trades with each non-affiliated counterparty. In each simulated period,

[15] We neglect the impact of fees owed by the DPC here.

[16] For counterparty ratings, "Payables" are amounts the DPC owes to its counterparties under its derivative contracts and not the notional amounts of those contracts.

[17] A DPC will run out of capital if the net value of defaults by non-affiliated counterparties exceeds the capital available to cover them.

capital is reduced (or increased, in some cases)[18] by payments made to counterparties (and noteholders, if any). Invested capital will also earn interest, while interest will accrue on any debt owed by the DPC. The capital model will take account of whether the trades with each counterparty can be netted. The loss ratio in the Formula above is calculated in the aggregate, across all counterparties.

3.1.3. Comparing Expected Loss to Moody's Idealized Expected Loss Rates

Expected loss ratios generated by capital models can be compared to our idealized loss rates at the relevant horizons.[19] Capital adequacy may be tested by checking if the expected loss ratio is less than a specified threshold commensurate with a DPC's target counterparty and debt ratings. These tests may be performed on a daily or weekly basis. Failure to cure any capital deficiency within a short grace period (typically one business day) may constitute a trigger event.

For a termination DPC, the applicable period of credit exposure is only a number of days, corresponding to the period from the occurrence of a trigger event to the termination settlement date. For a continuation DPC, however, the exposure time may be several years or longer, depending on the remaining lives of existing trades, which may be reduced by trades that are terminated or assigned.

3.1.4. A Minimum Capital Alternative to the Simulation Model

Simulation models capture much of the complexity of a derivatives book but are inevitably vulnerable to shortcomings. We cannot be certain that the assumptions behind the model are sufficiently accurate at all times.

To ensure that capital is not completely determined by a complex model, DPCs also adopt certain minimum capital overrides to the model-determined capital requirement. These typically take the form of simple aggregations of large counterparty exposures (see Section 3.1).

The DPC's capital requirement typically equals the larger of the model-determined and minimum capital override amount, to which is added the additional amounts described in the following section.

3.1.5. Additional Capital Amounts

3.1.5.1. AMOUNTS ASSOCIATED WITH PARTICULAR PRODUCTS

For the most part, DPC transactions represent a 'plain-vanilla' subset of the sponsor's overall derivatives business. However, on occasion it may be attractive for DPCs to enter into trades that are 'exotic.' Such transactions may have unusual structures, may reference measures other than typical interest or exchange rates, or may have unusual tenors.

DPCs will normally limit their exposure to such 'exotic' or illiquid trades. In addition, a DPC may need additional capital to offset any risks associated with these transactions. Thus, on a case by case

[18] Modeled capital generally declines as the capital model simulates counterparty defaults, but it can increase in some circumstances. If a continuation DPC is in its continuation mode, the DPC can have still unhedged trades because it is in the process of hedging out trades or is unable to do so. For the purpose of reporting, the DPC's capital model will reflect whatever is hedged or unhedged, rather than assume the DPC will hedge out those trades. Such unhedged trades can result in gains to the DPC's capital in some simulations.

Nevertheless, in normal operations, a typical capital model will not simulate outcomes with increased capital. Such capital models assume that all trades are hedged until a counterparty defaults, leaving the corresponding hedge with the non-defaulting counterparty momentarily unhedged. If the defaulting counterparty owes money to the DPC, the capital model assumes that DPC will terminate the trade with no recovery from the defaulting counterparty. At the same time, the capital model will assume that DPC will re-hedge at simulated market cost its obligations with the non-defaulting counterparty, using its own capital. If the defaulting counterparty is owed money, then the capital model assumes that the DPC will terminate (or possibly novate, in the case of the non-defaulting counterparty) the trades with the defaulting and non-defaulting counterparties, using the payment received from the non-defaulting counterparty to pay the defaulting counterparty and resulting in no change in capital.

[19] For more information, see *Rating Symbols and Definitions.* A link can be found in the "Moody's Related Publications" section.

basis, the DPC may require capital beyond the larger of the model-determined and minimum capital override amounts to mitigate the risk of non-standard transactions.[20]

3.1.5.2. A BUFFER FOR RISKS THAT CANNOT BE MODELED

In addition to allocating capital based on the results of the capital model, DPCs generally maintain a buffer against what may broadly be termed 'operational risk.' The purpose of the buffer is to provide resources to cover non-modeled risks. These include such things as model error, errors in the pricing of derivative products and errors in booking and processing trades. We conduct on-site reviews of the operations of each DPC before the initial rating to identify the strengths and weaknesses of its management team, internal operating and risk control procedures and infrastructure, to assess the adequacy of operational risk capital.

3.2. Collateral Adequacy

As explained in Section 2.5, collateral is posted to the DPC by its sponsor, typically pursuant to a Credit Support Annex (CSA) under the ISDA Master Agreement that covers the offsetting transactions between the DPC and the sponsor.[21] Collateral is sized to cover any existing mark-to-market amounts owed to the DPC by the sponsor, as well as potentially adverse changes in the net market value of a DPC's trades with its counterparties, following a trigger event.

Collateral typically takes the form of cash or cash-like instruments. However, government securities may also be posted as collateral, subject to haircuts for market and liquidity risk.[22]

3.2.1. Components of Collateral

The amount of collateral posted to a DPC by its sponsor affiliate consists of three components: (1) the net mark-to-market of all offsetting trades, (2) a Capital-Model-determined volatility buffer to cover potential adverse market movements after the occurrence of a trigger event but before the market risk is eliminated; and (3) any add-on collateral amount, reflecting factors not sufficiently captured by models, such as thin market liquidity of certain products.

For a termination DPC, the exposure period extends from the last date on which collateral was sized and posted prior to a termination event, until all trades with non-affiliated counterparties are valued. The span often incorporates an allowance for a market disruption that may postpone valuation, but in any case, the full exposure period is typically one to two weeks.

For a continuation DPC, the exposure period depends on how long it takes for the contingent manager to successfully re-hedge the book. A degree of basis risk – the potential for small gaps in the ability of the hedges to offset changes in the value of the DPC's book – may persist afterward, and some "dynamic hedging" may also be necessary to ensure that the hedges initially put in place remain effective.

In either case, the period over which market risk persists begins with the last opportunity to post collateral under the volatility buffer component before triggering of a termination or unwind. For example, if the volatility buffer amount was calculated and the related collateral was posted on a weekly basis, a maximum of a week could elapse before the sponsor defaults on the offsetting transactions with the DPC. The DPC is

[20] Non-standard transactions may also entail the posting of additional collateral to offset the market risk associated with the corresponding offsetting transactions.

[21] The DPC may also post or (more likely) receive collateral under its Master Agreements with unaffiliated third parties. When the DPC receives collateral from a third party, the collateral reduces the DPC's exposure to the counterparty. This reduction in exposure should be reflected in the Capital Model. In cases where the DPC must post to third parties, the collateral reduces any unmet obligation of the DPC to the third party.

[22] See footnote 8.

intended to be protected from market risk over that week, as well as during the period between that trigger event and the re-hedging or termination of the DPC's book.

In view of the short span of time between a trigger event and the re-hedging or elimination of market risk, default risk of non-affiliated counterparties during this period is overshadowed by the risk of material change in the mark-to-market exposure to these counterparties. We therefore consider the sufficiency and availability of a DPC's resources – typically collateral – to offset the potential change in exposure with a level of confidence consistent with our rating levels.

3.2.2. Using Elements of the Capital Model to Assess Collateral Adequacy

DPCs can use their capital model to determine collateral requirements since it simulates market paths. Such calculations are conceptually done by 'turning off' the counterparty default component of the model. Thus, the capital model may be used to simulate market paths, price each transaction and determine net receivable and payable amounts over the relatively short period of time during which market risk may be present.

The generation of market scenarios requires a number of assumptions, including volatility and correlation parameters for each of the relevant market underlying indices (currencies, interest rates, etc.). We review these assumptions when reviewing the adequacy of the capital model and revisit them whenever the capital model is materially changed such as to accommodate new products. The DPC updates the parameters on a regular (monthly or quarterly) basis to reflect the accumulation of new market data.

3.2.3. Testing of Collateral Adequacy

3.2.3.1. WHAT IS THE TESTING OF COLLATERAL ADEQUACY?

The collateral adequacy testing ("testing") we consider here is the comparison of the model-generated collateral requirements for test portfolios to the levels that would have been needed historically to cover the respective portfolio's market risk, calculated using observed market prices over various periods of time. More specifically, testing is the comparison of the Capital-Model-generated "volatility buffer" component of the collateral requirement[23] (see Section 3.2.1) to the actual change in the market value of a test portfolio over various market exposure periods. The purpose is to ensure that the model estimates changes in value such that, with a high degree of confidence, consistent with the DPC's rating, the DPC's resources will be sufficient to make all scheduled payments following a trigger event.

Testing is not normally a formal requirement set forth in the DPC's governing documents. Rather, it is undertaken as part of the ongoing monitoring of the DPC and is a highly useful tool for the evaluation of collateral adequacy. Thus, a failure to pass one or more tests would not typically trigger an unwind of the DPC but can have a negative impact on the counterparty rating we assign.

Testing occurs when the DPC is initially rated, taking account of the array of expected products, indices and tenors within the DPC's portfolio. As new products or indices or tenors are introduced after the DPC begins operating, testing is also performed to ensure that the collateral associated with the new instruments is sufficient. The proposed product, index or tenor is evaluated in a single-trade portfolio, within larger portfolio with similar risks and, potentially, within a very large portfolio representing the chief risks of the DPC's derivative portfolio as a whole. Moreover, as part of the exercise, the directionality of these tested portfolios is often reversed so that for instance, for testing purposes the DPC will be tested as if it was paying fixed on a swap rather than receiving fixed,

[23] The remaining two components of the collateral requirement discussed in Section 2 – current mark-to-market and any additional add-ons -- are not subject to market changes and therefore are not tested. The model-generated simulation of counterparty defaults is not evaluated via a similar testing exercise, as there have been few historic observations of counterparty defaults that have impacted DPCs. (Most non-affiliated, out-of-the-money DPC counterparties have investment-grade ratings).

increasing the range of outputs and also anticipating possible changes in the DPC's portfolio over time. Testing is expected to be performed at least annually to check the sufficiency of the "volatility buffer" using newly available market data.

Testing requires large amounts of historical market data. Indeed, we expect that all available and relevant historical data, including data covering financial crises, will be used for the exercise. The history should be sufficiently long so that all observed periods of market stress are included. When only a short history is available, as often the case for new products, we may incorporate the results of stress tests in addition to the results of testing to determine whether the collateral supporting trades in the new product is consistent with our current counterparty rating. The specifics of stress tests depend on the characteristics of the DPC's product portfolio, we will determine scenarios appropriate to assess the incremental risk introduced by the new products.[24]

The lag period between the model-determined collateral volatility buffer and the subsequent valuation of the portfolio for purpose of comparison is a function of the relevant risk window of the DPC. As an example, for a termination DPC with a risk window of three weeks, testing would compare at weekly intervals a test portfolio's volatility buffer with its change in MTM 15 business days later. Moreover, the comparison of the change in MTM is made at several interim points as well, e.g., at the 5th and 10th business days, as well as the 15th business day.

Each test portfolio is "frozen" in time, i.e. its weighted-average maturity is unchanged for the entirety of the testing exercise. Freezing the portfolio in this manner generates pairs of results (volatility buffer and subsequent change in portfolio MTM) that may be compared meaningfully across each testing exercise, as all such pair will have been subject to similar market sensitivities.

3.2.3.2. REVIEWING TESTING RESULTS

We assess whether the calculated volatility buffer component of collateral is sufficient to cover the historically observed changes in the MTM of the test portfolio up to a predefined confidence level. This confidence level is set in such a way that it is consistent with the expected default frequency associated with a DPC's target counterparty rating. Additionally, the magnitude by which each calculated volatility buffer covers the respective change in MTM, or fails to do so, is scrutinized independently. The size of any failure on its own is cause for close examination, even where the total number of failures is within the specified confidence interval. Similarly, repeated observations that pass by a very small amount are also reviewed.

Where the results for a test portfolio fall outside the confidence interval, or fall within the confidence interval but record sizeable fails or repeatedly pass with very small margins, we may determine the collateral posting is inconsistent with the target rating, and either not assign a rating or assign a lower rating.

Each test portfolio is analyzed on a stand-alone basis – the results are not aggregated across all test portfolios. The most stressful results are generally associated with single-product portfolios, and it is these that often undergo the most iterations of testing as the DPC refines its capital model. The larger, more diversified test portfolios that reflect real-world DPC operations generally pass testing more comfortably. Testing at the diversified portfolio level is the most critical and would raise significant concerns in the event of a test failure. Testing at the individual or sub-portfolio level is

[24] For example, DPCs have, from time to time, proposed trading emerging-market currency related products. In such a case, we may analyze scenarios where such currencies are dramatically devalued, or interest rates in these countries soar, as such scenarios may not be captured in historical market data for the relevant countries.

secondary but will be weighted more heavily should the particular product be expected to, or in fact over time constitute a significant portion of the whole portfolio.

3.2.3.3. LIMITATIONS OF TESTING AND MITIGANTS

If products are thinly traded, or historical data are inadequate, the capital model may not, by itself, be a reliable tool for measuring the sufficiency of resources. By 'inadequate,' we refer to cases in which meaningful price data for a product have only been available for a short period of time, or a structural change calls into question the relevance of historical data. In these cases, testing is still conducted using such data as are available, but we interpret the results taking into account these limitations. Scenario analysis may be applied to supplement the testing.

DPCs also address such concerns by adding significantly more collateral (or reserving more capital) than the capital model alone would suggest for the required collateral associated with the products or underlying indices. Typically, the DPC also limits size of trades and tenor of such underlying indices. Any such additional collateral (or capital) requirement will reflect the price sensitivity of the new product and any product concentration limits relative to the size of the DPC's overall portfolio. We assess the impact of these features on the DPC's rating.

We apply additional scrutiny to illiquid products whose pricing requires the use of somewhat subjectively determined parameters, such as implied correlations or volatilities for long-dated or deeply-out-of-the-money options. In such cases, testing has significant limitations, since both the model results and the reconstructed market prices will be based, at least in part, on assumptions that are difficult to verify. A typical strategy where such illiquid products are added to the approved products of a DPC is to constrain total exposure to a very small percentage of the DPC's portfolio. Substantial price verification and review of collateral (or capital) resources assigned to each such product is performed on an ongoing basis to reflect new market information.

3.3. Considerations for Continuation DPCs

In analyzing the capital and collateral adequacy of a continuation DPC, we are concerned with the length of time the DPC's derivative portfolio is exposed to market movements, and the capital and collateral it may require to achieve and maintain market neutrality throughout the continuation period until the last existing trade has matured or has been terminated or assigned.

As part of our ratings analysis, we assess whether (1) a continuation DPC has a set of carefully planned hedging strategies appropriate to the product mixes allowed within the limits of its governing documents; (2) the hedging strategies are viable even in a deeply distressed market environment; and (3) the DPC has a robust capital and liquidity model that reflects fully the first two factors in determining the DPC's required capital.

3.4. External Verification of DPC Product Pricing

The adequacy of the DPC's capital and collateral resources depends on, among other factors, the accuracy of the DPC's transaction pricing. Hence, it is critical that there be independent verification of the prices generated by the DPC.

Comparisons between DPC pricing and that of third parties provide comfort that the DPC's marks are truly representative of market pricing. Additionally, these comparisons provide information on the underlying robustness of the relevant market, which can indicate the need for additional collateral and tighter trading limitations.

While the settlement values that determine amounts owed to and by a termination DPC following termination are calculated by the DPC itself we evaluate whether the DPC's modeled prices are consistent with those of other market participants. To the extent that the DPC's pricing is out of line with those in the market, there is a risk that counterparties may challenge the marks.

A number of possible sources for such independent marks have been identified, with no single source being ideal (or even available for every case). Accordingly, we seek information from as many sources as possible, then use them to assess possible variation in pricing that may exist among market participants, including the DPC. The more price information that is available, the more finely tuned any adjustments can be proposed by the DPC regarding notional limitations or capital or collateral resources for a given target rating. Conversely, fewer information sources may be consistent only with very conservative modeling assumptions, even preclude the DPC trading. Sources used to date include:

» Polling by a third-party, such as an auditor, of bid and ask prices for the product in question. Typically, such polling is conducted for more generic products whose market robustness is already well established.

» Review of brokers screens on an ongoing basis, such as monthly. The observed trading volume and bid/ask spreads provide information on the robustness of the associated market. Typically, such comparisons are conducted by a DPC not only when a product is introduced, but on an ongoing basis. Periodic verification prevents an uncharacteristically narrow spread on one day from misrepresenting the tightness of bid-ask spreads or of spreads between related underlying indices.

» Bid/ask spreads on similar products, indices or tenors in different markets. Dealing spreads in more developed markets are in general smaller than in less developed ones. This could test the accuracy of pricing when analyzing any new product.

» Comparisons of the marks for a single trade prepared by each of the two institutions that are parties to the trade. As an example, the DPC sponsor and another major institution may each produce, and then reconcile, such marks for purposes of agreeing collateral amounts.

» Comparison of marks provided by individual dealers on independent systems that allow multiple institutions to value the same trade and receive feedback as to whether their pricing is within the range of other institutions or is an outlier.

» Auctions in which portfolios containing products of interest are assigned or liquidated.

Such external price verification is performed when the DPC is initially rated and upon the introduction of any new product, index, or a significant change in tenor. The governing documents typically require that verification of the pricing of all the DPC's products be revisited at least annually.

4. Legal Considerations

In addition to evaluating a DPC's ability to withstand market and credit risks, we also consider the legal and structural protections that are in place in evaluating the counterparty rating of the DPC. If the protections described below are not all in place, the relevant risks may have rating implications, such as linkage to the rating of the sponsor.

4.1. Risk of Consolidation with Sponsor

We assess whether a DPC's legal organization is structured to mitigate the risk of substantive consolidation of the DPC should its sponsor become subject to bankruptcy or similar proceedings.

We generally assume that a DPC will not be substantively consolidated with its bankrupt sponsor if either i) or ii) below is satisfied:

» *It is located in a jurisdiction that does not apply substantive consolidation*. Many legal systems, including those of most countries in Europe and Asia, do not allow for the possibility of substantive consolidation.[25]

» *It is established and operated in a manner that effectively excludes the risk of consolidation.* In jurisdictions that have a doctrine of substantive consolidation, such as the US, the risk of consolidation is generally mitigated if 1) the parties dealing with the DPC and the relevant affiliate do not rely on them being treated as one legal entity and 2) the assets and liabilities of the DPC are kept separate from those of its affiliate. DPCs are usually established and operated so that the risk of consolidation is minimized (e.g., by the inclusion of separateness covenants in their organizational documents).[26] If, in addition, effective security is granted over substantially all the DPC's assets (thereby reducing the incentive of the sponsor's creditors to seek substantive consolidation), we may conclude that the risk of substantive consolidation is effectively excluded.

4.2. Risk of Liabilities to Third Parties

We assess the risk of a DPC incurring liabilities to third parties. Key considerations include:

(i) *Restrictions on activities.* A DPC's operating procedures usually restrict the types of transactions in which it may engage.

(ii) *Independent directors.* We generally assume that independent directors have no incentive to violate the restrictions on a DPC's activities.

(iii) *Secondary liabilities.* We consider the likelihood and/or potential effects of a DPC incurring secondary liabilities in relation to unpaid tax or pension obligations of its parent.

(iv) *Employee claims.* We assess the sufficiency of reserves, such as operational risk capital held by a DPC, to cover any potential liability related to its role as an employer.

(v) *Tax.* We are able to discount the possibility of a claim by tax authorities if, for example, we receive satisfactory legal opinions to the effect that the DPC's permitted activities will not subject the DPC to entity level tax.

4.3. Risk of Voluntary Bankruptcy Filing

A voluntary bankruptcy filing by a DPC can have negative consequences for non-affiliated counterparties, such as delayed payments. Our assessment of this risk focuses on whether a bankrupt sponsor may procure the voluntary bankruptcy of its solvent DPC. Based on legal opinions from the relevant jurisdiction, we assess the likelihood that a solvent DPC may be eligible for voluntary bankruptcy proceedings.

If we determine that there is a meaningful possibility of a voluntary bankruptcy filing, we consider whether there are any mitigants to the risk. In particular, we assess whether a DPC's directors are sufficiently independent to provide an effective protection against voluntary bankruptcy (taking account of the DPC's organizational documents). We also consider features that may affect the incentive of the sponsor to procure a voluntary bankruptcy, such as a first priority perfected security interest over the assets of the DPC in favor of non-affiliated counterparties.

[25] Some jurisdictions have analogous doctrines in their bankruptcy laws, such as piercing the corporate veil, but they generally apply in very narrow circumstances and are typically not relevant to DPCs.

[26] We generally obtain legal opinions on this.

4.4. Collateral Posting and Netting

DPC sponsors or their affiliates provide mirrored trades for their DPC subsidiaries in order to eliminate market risk from third-party transactions. Although the occurrence of certain trigger events, such as the downgrade of the parent, will result in differing consequences under termination and continuation structures, the sponsor is in both cases required to secure its obligations to the DPC by posting collateral to a third-party custodian. Currently, such posting is done in either the United States or in the United Kingdom in order to ensure that the DPC would have a valid security interest in, or right to receive, such collateral. In the event of the sponsor's default, this collateral could be readily liquidated, and the proceeds would be available to the DPC. If the collateral is posted by entities located in jurisdictions other than the United States or the United Kingdom, we evaluate whether the interest of the DPC in such posted collateral is consistent with the rating assigned to the DPC.

Our rating of a DPC also recognizes that in calculating the level of exposure to a counterparty, the laws of the jurisdiction of that entity's incorporation should be considered in order to determine whether or not the DPC is able to employ close-out netting in the event of the counterparty's insolvency. For example, the U.S. Bankruptcy Code expressly provides the automatic stay will not prevent the setoff under the terms of "master netting agreements" for transactions protected by what are often referred to as the Bankruptcy Code's "safe harbors", such as the one applicable to "swap agreements" (as each of such terms are defined in the Code). Thus, our methodology assumes that close-out netting provisions for qualifying transactions are expected to operate effectively despite a transaction party's bankruptcy filing. In other jurisdictions, however, where it is not clear that the applicable insolvency regime will uphold the immediate enforceability of netting arrangements, gross exposures to a given counterparty must be considered. This would be applicable even though setoff for capital adequacy purposes might be recognized.

5. Role of the Independent Auditor

We take account of the role of the Independent Auditor in the assessment of a DPC rating. The Auditor is charged with providing Agreed Upon Procedure (AUP) reports with respect to both the sizing of the DPCs resources and adherence to the DPCs governing documents. Given the importance of the auditor's role, we will assess the capability of the auditor and the scope of its responsibilities in order to determine whether we can assign DPC's rating.

5.1. Role Prior to the Initial Rating

Prior to rating a DPC, we will review the verification of the DPC models through independent, reputable sources. Toward this end, the Auditor will test and report on various components of the capital model including, for example, the generation of market paths, the simulation of defaults, the computation of counterparty exposures, the calculation of the expected loss ratio and, finally, the calculation of required capital and collateral.

The Auditor will also conduct procedures to assess whether the DPC's pricing of its products is consistent with market practice. The Auditor may rely on widely available pricing services, the polling of dealers or, in some cases, its own models (see Section 3.4).

5.2. Ongoing Role

After the DPC has been established and rated, the Auditor will continue to supply periodic AUP letters to the DPC's Board and copies to us that independently verify information used by us to monitor ratings, including:

- The calculation and posting of required capital and collateral (including procedures applying to changes in the capital model)
- Accuracy of model inputs, including required market data and ratings of counterparties
- Consistency between the DPC's transactions and those permitted by its governing documents
- Consistency between the process for booking trades and the procedures spelled out in the governing documents
- Compliance with other aspects of the governing documents, including required add-on capital or collateral and portfolio limits
- Consistency between trades with non-affiliated counterparties and corresponding mirror trades with the sponsor
- The accuracy of pricing for existing products

As new products are proposed by the DPC, the Auditor will perform procedures to verify that the pricing of the new products is consistent with that of other market participants.

6. Monitoring

As part of our surveillance analysis, we generally apply the same assumptions and models we use when assigning initial ratings, except for those elements of the methodology that become less relevant over time or are not expected to change. Certain elements, such as reviews of assumptions, models or legal structures will not be re-reviewed unless circumstances warrant like a change in domicile of a key party. Dependent on the circumstances, we may further engage with the sponsor to obtain additional or updated information, including sometimes additional operational review meetings.

We track the transaction's performance trends (e.g., capital adequacy) as well as the actual development and characteristics of the portfolio. A meaningful change in any transaction feature or performance may trigger a full review of the transaction. We may also incorporate additional model runs, such as examining the impact of potential sales of assets and the associated decrease in exposure, as alternative scenarios to consider for our assessment of DPC ratings.[27] In some circumstances, a downgrade of the sponsor could also lead to a downgrade of the DPC.

As our ratings are largely based on provisions specified in the operating guidelines, upgrades are typically infrequent, except where the rating of the sponsor exceeds the rating of the DPC. We will generally consider a rating downgrade if the DPC fails to perform as per its operating guidelines or if new circumstances affect the legal environment in which the DPC or its sponsor operates.

[27] For example, in methodologies where models are used, modeling is not relevant when it is determined that (1) a transaction is still revolving and performance has not changed from expectations, or (2) all tranches are at the highest achievable ratings and performance is at or better than expected performance, or (3) key model inputs are viewed as not having materially changed to the extent it would change outputs since the previous time a model was run, or (4) no new relevant information is available such that a model cannot be run in order to inform the rating, or (5) our analysis is limited to asset coverage ratios for transactions with undercollateralized tranches, or (6) a transaction has few remaining performing assets.

Moody's Related Publications

Credit ratings are primarily determined through the application of sector credit rating methodologies. Certain broad methodological considerations (described in one or more cross-sector rating methodologies) may also be relevant to the determination of credit ratings of issuers and instruments. A list of sector and cross-sector credit rating methodologies can be found here.

For data summarizing the historical robustness and predictive power of credit ratings, please click here.

For further information, please refer to *Rating Symbols and Definitions*, which includes a discussion of Moody's Idealized Probabilities of Default and Expected Losses, and which is available here.

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