Chapter 4

Credit risk

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4.1 Application and purpose

Application

4.1.1 R IFPRU 4 applies to an *IFPRU investment firm*, unless it is an *exempt IFPRU commodities firm*.

Purpose

4.1.2 G This chapter:

(1) implements article 78 of *CRD*;

(2) contains the *rules* that exercise the discretion afforded to the *FCA* as *competent authority* under articles 115, 119(5), 124(2), 125(3), 126(2), 178(1)(b), 244(2), 245(2), 286(2), 298(4) and 380 of the *UK CRR*; and

(3) contains the *guidance* in relation to the IRB approach, *securitisation*, counterparty credit risk and *credit risk mitigation*.

4.2 Standardised approach

Standardised approach

4.2.1 R For the purposes of article 115 of the *UK CRR* (Exposures to regional governments or local authorities), a *firm* may treat *exposures* to the following regional governments as *exposures* to the *UK* central government:

(1) The Scottish Parliament;

(2) The National Assembly for Wales; and

(3) The Northern Ireland Assembly.

Risk weights

4.2.2 G Where the *FCA* has published evidence showing that a well-developed and long-established residential property market is present in that territory with loss rates which do not exceed the limits in article 125(3) of the *UK CRR* (Exposures fully and completely secured by mortgages on residential property), a *firm* does not need to meet the condition in article 125(2)(b) of the *UK CRR* in order to consider an *exposure*, or any part of an *exposure*, as fully and completely secured for the purposes of article 125(1) of the *UK CRR*.

Criteria for certain exposures secured by mortgages on commercial immovable property

4.2.3 R For the purposes of articles 124(2) and 126(2) of the *UK CRR*, and in addition to the conditions in those regulations, a *firm* may only treat *exposures* as fully and completely secured by mortgages on commercial immovable property located in the *UK* in line with article 126 where annual average losses stemming from lending secured by mortgages on commercial property in the UK did not exceed 0.5% of risk-weighted exposure amounts over a representative period. A *firm* must calculate the *loss* level in this *rule* on the basis of the aggregate market data for commercial property lending published by the *FCA* in line with article 101(3) of the *UK CRR*.

4.2.4 R For the purpose of this *rule*, a representative period shall be a time horizon of sufficient length and which includes a mix of good and bad years.

Exposures to institutions

4.2.5 G The *FCA* confirms that, in relation to the concessionary treatment set out in article 119(5) of the *UK CRR*, there are no *financial institutions* currently

authorised and supervised by it (other than those to which the *UK CRR* applies directly) that are subject to prudential requirements that it considers to be comparable in terms of robustness to those applied to *institutions* under the *UK CRR*.

[**Note**: article 119(5) of the *UK CRR*]

Retail exposures

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4.2.6 G Where an *exposure* is denominated in a currency other than the euro, the *FCA* expects a *firm* to use appropriate and consistent exchange rates to determine compliance with relevant thresholds in the *UK CRR*. Accordingly, a *firm* should calculate the euro equivalent value of the *exposure* for the purposes of establishing compliance with the aggregate monetary limit of €1 million for retail *exposures* using a set of exchange rates the *firm* considers to be appropriate. The *FCA* expects a *firm's* choice of exchange rate to have no obvious bias and to be derived on the basis of a consistent approach (see article 123(c) of the *UK CRR*).

Exposures fully and completely secured by mortgages on residential property: Ijara mortgages

4.2.7 G The *FCA* considers an Ijara mortgage to be an example of an *exposure* to a tenant under a property leasing transaction concerning residential property under which the *firm* is the lessor and the tenant has an option to purchase. Accordingly, the *FCA* expects *exposures* to Ijara mortgages to be subject to all of the requirements that apply to *exposures* secured by mortgages on residential property, including in respect of periodic property revaluation (see articles 124 and 125 of the *UK CRR*).

Lifetime mortgages

4.2.8 G The *FCA* expects a *firm* with exposure to a *lifetime mortgage* to inform the *FCA* of the difference in the *own funds requirements* on those *exposures* under the *UK CRR* and the credit risk capital requirement that would have applied under ■ BIPRU 3.4.56A R.The *FCA* will use this information in its consideration of relevant risks in its supervisory assessment of the *firm* (see articles 124, 125 and 208 of the *UK CRR*).

Exposures in default

4.2.9 G When determining the portion of a past due item that is secured, the *FCA* expects the secured portion of an *exposure* covered by a mortgage indemnity product that is eligible for *credit risk mitigation* purposes under Part Three, Title II, Chapter 4 of the *UK CRR* (Credit risk mitigation) to qualify as an eligible guarantee (see article 129(2) of the *UK CRR*).

Items associated with particularly high risk

4.2.10 G When determining whether *exposures* in the form of units or shares in a *CIU* are associated with particularly high risk, the *FCA* expects the following features would be likely to give rise to such risk:

(1) an absence of external credit assessment of such *CIU* from an *ECAI* recognised under article 132(2) of the *UK CRR* (Items representing

securitisation positions) and where such *CIU* has specific features (such as high levels of leverage or lack of transparency) that prevent it from meeting the eligibility criteria in article 132(3) of the *UK CRR* (Items associated with particular high risk); or

(2) a substantial element of the *CIU's* property is made up of items that would be subject to a risk weight of more than 100%, or the mandate of a *CIU* would permit it to invest in a substantial amount of such items.

4.2.11 G The *FCA* expects a *firm's* assessment of whether types of *exposure* referred to in article 128(3) of the *UK CRR* are associated with particularly high risk to include consideration of *exposures* arising out of a venture capital business (whether the *firm* itself carries on the venture capital business or not) . The *FCA* considers "venture capital business" to include the business of carrying on any of the following:

(1) advising on investments, *managing investments*, *arranging (bringing about) deals in investments* in or *making arrangements with a view to transactions in investments* in *venture capital investments*;

(2) advising on investments or *managing investments* in relation to portfolios, or *establishing, operating or winding up a collective investment scheme*, where the portfolios or collective investment schemes (apart from funds awaiting investment) invest only in *venture capital investments*;

(3) any *custody* activities provided in connection with the activities in (1) or (2); and

(4) any related *ancillary activities*.

4.2.12 G [deleted]

4.3 Guidance on internal ratings based approach: high level material

4.3.1 G Responsibility for ensuring that internal models are appropriately conservative and that approaches are compliant with the *UK CRR* rests with the *firm* itself.

4.3.2 G A *significant IFPRU firm* should consider developing internal credit risk assessment capacity and to increase use of the internal ratings based approach for calculating *own funds requirements* for credit risk where its *exposures* are material in absolute terms and where it has at the same time a large number of material counterparties. This provision is without prejudice to the fulfilment of criteria laid down in Part Three, Title I, Chapter 3, Section 1 of the *UK CRR* (IRB approach).

[**Note**: article 77(1) of *CRD*]

4.3.3 G The *FCA* will, taking into account the nature, scale and complexity of a *firm's* activities, monitor that it does not solely or mechanistically rely on external credit ratings for assessing the creditworthiness of an entity or *financial instrument*.

[**Note**: article 77(2) of *CRD*]

Application of requirements to EEA groups applying the IRB approach on a unified basis

4.3.4 G Article 20(6) of the *UK CRR* states that, where the IRB approach is used on a unified basis by those entities which fall within the scope of article 20(6), the *FCA* is required to permit certain IRB requirements to be met on a collective basis by members of that group. In particular, the *FCA* considers that, where a *firm* is reliant upon a rating system or data provided by another member of its group, it will not meet the condition that it is using the IRB approach on a unified basis unless:

(1) the *firm* only does so to the extent that it is appropriate, given the nature and scale of the *firm's* business and portfolios and the *firm's* position within the group;

(2) the integrity of the *firm's* systems and controls is not adversely affected;

(3) the outsourcing of these functions meets the requirements of *SYSC*; and

(4) the abilities of the *FCA* and the *consolidating supervisor* of the group to carry out their responsibilities under the *UK CRR* are not adversely affected.

4.3.5 G Prior to reliance being placed by a *firm* on a rating system or data provided by another member of the group, the *FCA* expects the proposed arrangements to have been explicitly considered, and found to be appropriate, by the *governing body* of the *firm*.

4.3.6 G If a *firm* uses a rating system or data provided by another group member, the *FCA* would expect the *firm's governing body* to delegate those functions formally to the persons or bodies that are to carry them out.

Materiality of non-compliance

4.3.7 G Where a *firm* seeks to demonstrate to the *FCA* that the effect of its non-compliance with the requirements of Part Three, Title II Chapter 3 of the *UK CRR* (Internal ratings based approach) is immaterial under article 146(b) of the *UK CRR* (Measures to be taken where the requirements cease to be met), the *FCA* expects the *firm* to have taken into account all instances of non-compliance with the requirements of the IRB approach and to have demonstrated that the overall effect of non-compliance is immaterial.

Corporate governance

4.3.8 G

(1) Where the *firm's* rating systems are used on a unified basis under article 20(6) of the *UK CRR*, the *FCA* considers that the governance requirements in article 189 of the *UK CRR* can only be met if the subsidiaries have delegated to the *governing body* or designated committee of the *UK parent institution*, *UK parent financial holding company* or *UK parent mixed financial holding company* responsibility for approval of the *firm's* rating systems.

(2) The *FCA* expects an appropriate individual in a *designated senior management function* role to provide to the *FCA* on an annual basis written attestation that the rating system permissions required by the *UK CRR* have been carried out appropriately.

[**Note**: see articles 189 and 20(6) of the *UK CRR* and article 3(1)(7) of *CRD*]

Permanent partial use: policy for identifying exposures

4.3.9 G The *FCA* expects a *firm* seeking to apply the Standardised Approach on a permanent basis to certain *exposures* to have a well-documented policy explaining the basis on which *exposures* are to be selected for permanent exemption from the IRB approach. This policy should be provided to the *FCA* when the *firm* applies for permission to use the IRB approach and maintained thereafter. Where a *firm* also wishes to undertake sequential implementation, the *FCA* expects the *firm's* roll-out plan to provide for the continuing application of that policy on a consistent basis over time.

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Permanent partial use: exposures to sovereigns and institutions

4.3.10 G

(1) The *FCA* may permit the exemption of *exposures* to sovereigns and *institutions* under article 150(1)(a) and (b) of the *UK CRR* respectively only if the number of material counterparties is limited and it would be unduly burdensome to implement a rating system for such counterparties.

(2) The *FCA* considers that the 'limited number of material counterparties' test is unlikely to be met if for the UK group total outstandings to 'higher risk' sovereigns and institutions exceed either £1bn or 5% of total assets (other than for temporary fluctuations above these levels). For these purposes, 'higher risk' sovereigns and *institutions* are considered to be those that are unrated or carry ratings of BBB+ (or equivalent) or lower. In determining whether to grant this exemption, the *FCA* will also consider whether a *firm* incurs *exposures* to 'higher risk' counterparties which are below the levels set out but are outside the scope of its core activities.

(3) In respect of the 'unduly burdensome' condition, the *FCA* considers that an adequate, but not perfect, proxy for the likely level of expertise available to a *firm* is whether its group has a *trading book*. Accordingly, if a *firm's* group does not have a *trading book*, the *FCA* is likely to accept the argument that it would be unduly burdensome to implement a rating system.

Permanent partial use: non-significant business units and immaterial exposure classes and types

4.3.11 G

Where a *firm* wishes permanently to apply the Standardised Approach to certain business units on the grounds that they are non-significant and/or certain *exposure* classes or types of *exposures* on the grounds that they are immaterial in terms of size and perceived risk profile, the *FCA* expects to permit a *firm* to make use of this exemption only to the extent that the risk-weighted exposure amount calculated under article 92(3)(a) and (f) of the *UK CRR* that are based on the Standardised Approach (insofar as they are attributable to the *exposures* to which the Standardised Approach is permanently applied) would be no more than 15% of the risk-weighted exposure amount calculated under article 92(3)(a) and (f) of the *UK CRR*, based on whichever of the Standardised Approach and the IRB Approach would apply to the *exposures* at the time when the calculation is being made.

4.3.12 G

The following points set out the level at which the *FCA* expects the 15% test to be applied for a *firm* that is a member of a *group*:

(1) if a *firm* is part of a group subject to consolidated supervision in the *UK* and for which the *FCA* is the *consolidating supervisor*, the calculations in (1) are carried out with respect to the wider *group*;

(2) if a *firm* is part of a group subject to consolidated supervision in the *UK* and for which the *FCA* is not the *consolidating supervisor* the calculation in (1) would not apply but the requirements of the *consolidating supervisor* relating to materiality will need to be met for the wider *group*;

(3) if the *firm* is part of a sub-group subject to consolidated supervision in the *UK* and part of a wider third-country group subject to equivalent supervision by a regulatory authority outside of the *UK*, the calculation in (1) would not apply but the requirements of the consolidating or lead regulator relating to materiality would need to be met for both the sub-group and the wider *group*; and

(4) if the *firm* is part of a sub-group subject to consolidated supervision in the *UK* and is part of a wider third-country group that is not subject to equivalent supervision by a regulatory authority outside of the *UK*, then the calculation in (1) would apply for the wider *group* if supervision by analogy is applied and for the sub-group if other alternative supervisory techniques are applied.

4.3.13 G Whether a third-country group is subject to equivalent supervision, whether it is subject to supervision by analogy or whether other alternative supervisory techniques apply, is decided in accordance with ■ GENPRU 3.2 (Third-country groups). (See article 150(1)(c) of the *UK CRR*.)

Permanent partial use: identification of connected counterparties

4.3.14 G Where a *firm* wishes to permanently apply the Standardised Approach to *exposures* to connected counterparties in accordance with article 150(1)(e) of the *UK CRR*, the *FCA* would normally expect to grant permission to do so only if the *firm* had a policy that provided for the identification of connected counterparties *exposures* that would be permanently exempted from the IRB approach and also identified connected counterparty *exposures* (if any) that would not be permanently exempted from the IRB approach. The *FCA* expects a *firm* to use the IRB approach either for all of its intra-group *exposures* or none of them (see article 150(1)(e) of the *UK CRR*).

Sequential implementation following significant acquisition

4.3.15 G In the event that a *firm* with IRB permission acquires a significant new business, it should discuss with the *FCA* whether sequential roll-out of the *firm's* IRB approach to these *exposures* would be appropriate. In addition, the *FCA* would expect to review any existing time period and conditions for sequential roll-out and determine whether these remain appropriate (see article 148 of the *UK CRR*).

Classification of retail exposures: qualifying revolving retail exposures (QRRE)

4.3.16 G (1) Article 154(4)(d) of the *UK CRR* (Risk-weighted exposure amounts for retail exposures) specifies that, for an *exposure* to be treated as a qualifying revolving retail *exposure* (QRRE), it needs to exhibit relatively low volatility of loss rates. A *firm* should assess the volatility of loss rates for the QRRE portfolio relative to the volatilities of loss rates of other relevant types of retail *exposures* for these purposes. Low volatility should be demonstrated by reference to data on the mean and standard deviation of loss rates over a time period that can be regarded as representative of the long-run performance of the portfolios concerned.

(2) Article 154(4)(e) of the *UK CRR* specifies that, for an *exposure* to be treated as a QRRE, this treatment should be consistent with the underlying risk characteristic of the sub-portfolio. The *FCA* considers that a sub-portfolio consisting of credit card or overdraft obligations will usually meet this condition and that it is unlikely that any other type of retail *exposure* will do so. If a *firm* wishes to apply the treatment in article 154 (4) of the *UK CRR* to product types other than credit card or overdraft obligations, the *FCA* expects it to discuss this with the *FCA* before doing so.

Documentation

4.3.17 G The *FCA* expects a *firm* to ensure that all documentation relating to its rating systems (including any documentation referenced in this chapter or required by the *UK CRR* that relate to the IRB approach) is stored, arranged and indexed in such a way that it could make them all, or any subset thereof, available to the *FCA* immediately on demand or within a short time thereafter.

4.4 Internal ratings based approach: overall requirements for estimation

High-level expectations

4.4.1 G In order to be able to determine that the requirements in article 144(1) of the *UK CRR* have been met, the *FCA* would typically have the high-level expectations set out in this section.

4.4.2 G The information that a *firm* produces or uses for the IRB approach should be reliable and take proper account of the different users of the information produced (customers, shareholders, regulators and other market participants).

4.4.3 G A *firm* should establish quantified and documented targets and standards, against which it should test the accuracy of data used in its rating systems. Such tests should cover:

(1) a report and accounts reconciliation, including whether every *exposure* has a PD, LGD and, if applicable, conversion factor for reporting purposes;

(2) whether the *firm's* risk control environment has key risk indicators for the purpose of monitoring and ensuring data accuracy;

(3) whether the *firm* has an adequate business and information technology infrastructure with fully documented processes;

(4) whether the *firm* has clear and documented standards on ownership of data (including inputs and manipulation) and timeliness of current data (daily, monthly, real time); and

(5) whether the *firm* has a comprehensive quantitative audit programme.

4.4.4 G In respect of data inputs, the testing for accuracy of data (including the reconciliation referred to above) should be sufficiently detailed so that, together with other available evidence, it gives reasonable assurance that data input into the rating system is accurate, complete and appropriate. The *FCA* considers that input data fails to meet the required standard if it gives rise to a serious risk of material misstatement in the *own funds requirement* either immediately or subsequently.

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4.4.5 G In respect of data outputs, a *firm* (as part of the reconciliation referred to above) should be able to identify and explain material differences between the outputs produced under accounting standards and those produced under the requirements of the IRB approach, including in relation to areas that address similar concepts in different ways (eg, expected loss and accounting provisions).

4.4.6 G A *firm* should have clear and documented standards and policies about the use of data in practice (including information technology standards) which should, in particular, cover the *firm's* approach to the following:

(1) data access and security;

(2) data integrity, including the accuracy, completeness, appropriateness and testing of data; and

(3) data availability.

[**Note**: article 144(1)(a) of the *UK CRR*)

Rating systems: policies

4.4.7 G For the *FCA* to be satisfied that a *firm* documents its ratings systems appropriately, in accordance with article 144(1)(e) of the *UK CRR*, it would expect a *firm* to be able to demonstrate that it has an appropriate policy for any ratings system in relation to:

(1) any deficiencies caused by its not being sensitive to movements in fundamental risk drivers or for any other reason;

(2) the periodic review and action in the light of such review;

(3) providing appropriate internal guidance to staff to ensure consistency in the use of the rating system, including the assignment of *exposures* or facilities to pools or grades;

(4) dealing with potential weaknesses of the rating system;

(5) identifying appropriate and inappropriate uses of the rating system and acting on that identification;

(6) novel or narrow rating approaches; and

(7) ensuring the appropriate level of stability over time of the rating system.

[**Note**: article 144(1)(a) and (e) of the *UK CRR*)

Collection of data

4.4.8 G To be satisfied that the requirements in article 179(1) of the *UK CRR* are met, the *FCA* expects a *firm* to collect data on what it considers to be the main drivers of the risk parameters of probability of default (PD), loss given default (LGD), conversion factors (CFs) and expected loss (EL) for each group of obligors or facilities, to document the identification of the main drivers of

risk parameters, and be able to demonstrate that the process of identification is reasonable and appropriate.

4.4.9 G In its processes for identifying the main drivers of risk parameters, the *FCA* expects that a *firm* should set out its reasons for concluding that the data sources chosen provide in themselves sufficient discriminative power and accuracy and why additional potential data sources do not provide relevant and reliable information that would be expected materially to improve the discriminative power and accuracy of its estimates of the risk parameter in question. This process need not necessarily require an intensive analysis of all factors.

[**Note**: article 179(1)(a), (d) and (e) of the *UK CRR*)

Data quality

4.4.10 G To demonstrate that rating systems provide for meaningful assessment, the *FCA* expects that a *firm's* documentation relating to data should include clear identification of responsibility for data quality. A *firm* should set standards for data quality, aim to improve them over time and measure its performance against those standards. Furthermore, a *firm* should ensure that its data is of high enough quality to support its risk management processes and the calculation of its *own funds requirements* (see article 175(1) of the *UK CRR*).

Use of models and mechanical methods to produce estimates of parameters

4.4.11 G Further detail of standards that the *FCA* would expect a *firm* to meet when it assesses compliance with article 174 of *UK CRR* are set out in the sections on probability of default (PD), loss given default (LGD) and exposure at default (EAD).

4.4.12 G In assessing whether the external data used by a *firm* to build models is representative of its actual obligors or *exposures*, the *FCA* expects a *firm* to consider whether this data is appropriate to its own experience and whether adjustments are necessary (see article 174 of the *UK CRR*).

Calculation of long averages PD, LGD and EAD

4.4.13 G To estimate PDs that are long run averages of one-year default rates for obligor grades or pools, the *FCA* expects a *firm* to estimate expected default rates for the grade/pool over a representative mix of good and bad economic periods, rather than simply taking the historic average of default rates actually incurred by the *firm* over a period of years. The *FCA* expects that a long run estimate would be changed when there is reason to believe that the existing long run estimate is no longer accurate, but that it would not be automatically updated to incorporate the experience of additional years as these may not be representative of the long run average (see article 180 of the *UK CRR*).

4.4.14 G To demonstrate compliance with article 144(1) of the *UK CRR*, the *FCA* expects a *firm* to take into account the following factors in understanding

differences between their historic default rates and their PD estimates, and in adjusting the calibration of their estimates as appropriate:

(1) the rating philosophy of the system and the economic conditions in the period over which the defaults have been observed;

(2) the number of defaults, as a low number is less likely to be representative of a long run average. Moreover, where the number of internal defaults is low, there is likely to be a greater need to base PDs on external default data as opposed to purely internal data;

(3) the potential for under-recording of actual defaults; and

(4) the level of conservatism applied.

4.4.15 G The *FCA* expects a *firm* that is unable to produce a long run estimate, as described above, to consider what action it would be appropriate for it to take to comply with article 180(1)(a) of the *UK CRR*. In some circumstances, it may be appropriate for a *firm* to need to amend its rating system so that the PD used as an input into the IRB *own funds requirement* is an appropriately conservative estimate of the actual default rate expected over the next year. However, such an approach is not likely to be appropriate where default rates are dependent on the performance of volatile collateral. (See articles 179(1)(f) and 180(1)(a) of the *UK CRR*).

4.4.16 G In accordance with articles 181(1)(b) and 182(1)(b) of the *UK CRR*, where the estimates appropriate for an economic downturn are more conservative than the long run average, the *FCA* expects the estimate for each of these parameters to represent the LGD or CF expected, weighted by the number of defaults, over the downturn period. Where this is not the case, the *FCA* expects the estimate to be used to be the expected LGD or CF, weighted by the number of defaults, over a representative mix of good and bad economic periods (see articles 179, 181 and 182 of the *UK CRR*).

Assignment to grades or pools

4.4.17 G To demonstrate that a rating system provides for a meaningful differentiation of risk and accurate and consistent quantitative estimates of risk, the *FCA* expects a *firm* would have regard to the sensitivity of the rating to movements in fundamental risk drivers, in assigning *exposures* to grades or pools within a rating system (see article 171 of the *UK CRR*).

4.5 Internal ratings based approach: definition of default

Identification of obligors

4.5.1 G The *FCA* expects that if a *firm* ordinarily assigns *exposures* in the corporate, *institution* or central government and central bank *exposure* classes to a member of a *group*, substantially on the basis of membership of that *group* and a common group rating, and the *firm* does so in the case of a particular obligor group, the *firm* should consider whether members of that *group* should be treated as a single obligor for the purpose of the definition of default in article 178(1) of the *UK CRR*.

4.5.2 G The *FCA* would not expect a *firm* to treat an obligor as part of a single obligor under ■ IFPRU 4.5.1 G if the *firm* rates its *exposures* on a standalone basis or if its rating is notched. (For these purposes, a rating is notched if it takes into account individual risk factors or otherwise reflects risk factors that are not applied on a common group basis.) Accordingly, if a *group* has two members which are separately rated, the *FCA* will not expect that the default of one will necessarily imply the default of the other.

Days past due

4.5.3 G Under article 178(1)(b) of the *UK CRR*, the *FCA* is empowered to replace 90 days with 180 days in the days past due component of the definition of default for *exposures* secured by residential or SME commercial real estate in the retail exposure class, as well as *exposures* to public sector entities (PSEs).

4.5.4 G The *FCA* would expect to replace 90 days with 180 days in the days past due component of the definition of default for *exposures* secured by residential real estate in the retail *exposure* class, and/or for *exposures* to PSEs, where this was requested by the *firm*. Where this occurred, it would be specified in the *firm's* IRB permission.

Unlikeliness to pay in distressed restructuring

4.5.5 G The *FCA* expects that a credit obligation be considered as a distressed restructuring if an independent third party, with expertise in the relevant area, would not be prepared to provide financing on substantially the same terms and conditions (see article 178(2)(d) of the *UK CRR*).

Returning to performing status

4.5.6 G To be satisfied that a *firm* complies with the documentation requirements in article 175(3) of the *UK CRR*, the *FCA* expects a *firm* should have a clear and documented policy for determining whether an exposure that has been in default should subsequently be returned to performing status (see article 175(3) of the *UK CRR*).

4.6 Internal ratings based approach: probability of default

Rating system philosophy

4.6.1 G 'Rating philosophy' describes the point at which a rating system sits on the spectrum between the stylised extremes of a point in time (PiT) rating system and a through-the-cycle (TTC) rating system. To explain these concepts:

(1) PiT: a *firm* seeks to explicitly estimate default risk over a fixed period, typically one year. Under such an approach, the increase in default risk in a downturn results in a general tendency for migration to lower grades. When combined with the fixed estimate of the long-run default rate for the grade, the result is a higher *own funds requirement*. Where data are sufficient, grade level default rates tend to be stable and relatively close to the PD estimates; and

(2) TTC: a *firm* seeks to remove cyclical volatility from the estimation of default risk, by assessing borrowers' performance across the economic cycle. TTC ratings do not react to changes in the cycle, so there is no consequent volatility in capital requirements. Actual default rates in each grade diverge from the PD estimate for the grade, with actual default rates relatively higher at weak points in the cycle and relatively lower at strong points.

4.6.2 G Most rating systems sit between these two extremes. Rating philosophy is determined by the cyclicality of the drivers/criteria used in the rating assessment and should not be confused with the requirement for grade level PDs to be "long run". The calibration of even the most PiT rating system needs to be targeted at the long run default rates for its grades; the use of long run default rates does not convert such a system into one producing TTC ratings or PDs

4.6.3 G A *firm* should understand where its rating systems lie on the PiT/TTC spectrum to enable it to estimate how changes in economic conditions will affect its IRB *own funds requirements* and it should be able to compare the actual default rates incurred against the default rate expected over the same period given the economic conditions pertaining, as implied by its PD estimate.

Use of variable scalar approaches

4.6.4 G The term "variable scalar" is used to describe approaches in which the outputs of an underlying, relatively PiT, rating system are transformed to produce final PD estimates used for regulatory capital requirements that are

relatively non-cyclical. Typically, this involves basing the resulting requirement on the long run default rate of the portfolio or its segments.

4.6.5 G Article 169(3) of the *UK CRR* allows the use of direct estimates of PDs, although such a measure could be assessed over a variety of different time horizons which the *EU CRR* does not specify. Accordingly, the *FCA* considers that it acceptable in principle to use methodologies of this type in lieu of estimation of long-run averages for the grade/pool/score of the underlying rating system, where the following conditions are met. Meeting these conditions requires a *firm* using the variable scalar approach to have a deep understanding of how and why its default rates vary over time:

(1) a *firm* meets the following four principles which address the considerable conceptual and technical challenges to be overcome in order to carry out variable scalar adjustments in an appropriate way:

Principle 1: both the initial calculations of, and subsequent changes to, the scalar must be able to take account of changes in default risk that are not purely related to the changes in the cycle;

Principle 2: a *firm* must be able accurately to measure the long-run default risk of its portfolio; this must include an assumption that there are no changes in the business written;

Principle 3: a *firm* must use a data series of appropriate length in order to provide a reasonable estimate of the long-run default rate in ■ IFPRU 4.4.13 G (Calculation of long averages PD, LGD and EAD); and

Principle 4: a *firm* must be able to demonstrate the appropriateness of the scaling factor being used across a portfolio;

(2) stress testing includes a stress test covering the downturn scenario outlined in IFPRU 2.2 (Internal capital adequacy assessment process)] based on the PDs of the underlying PiT rating system, in addition to the stress test based on the parameters used in the Pillar 1 *own funds requirements* calculation (ie, the portfolio level average long-run default rates); and

(3) a *firm* is able to understand and articulate upfront how the scaling factor would vary over time in order to achieve the intended effect.

4.6.6 G The *FCA* will not permit a *firm* using a variable scalar approach to revert to using a PiT approach during more benign economic conditions.

4.6.7 G Principle 1 (in ■ IFPRU 4.6.5 G) is the most important and challenging to achieve as it requires an ability to be able to distinguish movements not related to the economic cycle, from changes purely related to the economic cycle, and not to average these away. This is because a variable scalar approach removes the ability of a rating system to take account automatically of changes in risk through migration between its grades.

4.6.8 G Accordingly, the *FCA* expects a *firm* using a variable scalar approach should adopt a PD that is the long-run default rate expected over a representative

mix of good and bad economic periods, assuming that the current lending conditions including borrower mix and attitudes and the *firm's* lending policies remain unchanged. If the relevant lending conditions or policies change, then the *FCA* would expect the long-run default rate to change (see article 180(1)(a), (b) and (2)(a) of the *UK CRR*).

Variable scalar considerations for retail portfolios

4.6.9 G The *FCA* considers that, until more promising account level arrears data is collected, enabling *firms* to better explain the movement in their arrears rate over time, the likelihood of *firms* being able to develop a compliant variable scalar approach for non-mortgage retail portfolios is low. This is because of the difficulty that *firms* have in distinguishing between movements in default rates that result from cyclical factors and those that result from non-cyclical reasons for these portfolios. In practice, the rest of this section applies to residential mortgage portfolios.

4.6.10 G For the purposes of this subsection 'non-mortgage retail portfolios' refers to non-mortgage lending to individuals (eg, credit cards, unsecured personal loans, auto-finance) but does not include portfolio of *exposures* to small and medium-sized entities (SMEs in the retail *exposure* class).

4.6.11 G The *FCA* considers that one variable scalar approach, potentially compliant with the four principles in ■ IFPRU 4.6.5 G, could involve:

(1) segmenting a portfolio by its underlying drivers of default risk; and

(2) estimating separate long-run default rates for each of these segmented pools.

Segmentation

4.6.12 G A *firm* that applied the segmentation approach properly could satisfy both Principle 1 and Principle 4 (■ IFPRU 4.6.5 G). The choice of the basis of segmentation and the calibration of the estimated long-run default rate for the segments would both be of critical importance.

4.6.13 G Segmentation should be done on the basis of the main drivers of both willingness and ability to pay. In the context of residential mortgages, an example of the former is the amount of equity in the property and an example of the latter is the ratio of debt to income. The *FCA* expects a *firm* to:

(1) incorporate an appropriate number of drivers of risk within the segmentation to maximise the accuracy of the system;

(2) provide detailed explanations supporting its choices of drivers, including an explanation of the drivers it has considered and chosen not to use; and

(3) ensure that the drivers reflect its risk processes and lending policy, and is therefore not chosen using only statistical criteria (ie a judgemental assessment of the drivers chosen must be applied).

[**Note**: article 179(1)(d) of the *UK CRR*]

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4.6.14 G To the extent that the basis of segmentation is not sufficient completely to explain movements in non-cyclical default risk, the long-run default rate for that segment will not be stable (eg, a change in the mix of the portfolio within the segment could change the long-run default rate). In such cases, the *FCA* would expect a *firm* to make a conservative compensating adjustment to the calibration of the long-run average PD for the affected segments and be able to demonstrate that the amount of judgement required to make such adjustments is not excessive. Where judgement is used, considerable conservatism may be required. The *FCA* expects conservatism applied for this reason not to be removed as the cycle changes.

Long-run default rate

4.6.15 G The *FCA* expects a *firm* to review and amend as necessary the long run default rate to be applied to each segment on a regular (at least an annual) basis. When reviewing the long run default rate to be applied to each segment, the *FCA* expects a *firm* to consider the extent to which:

(1) realised default rates are changing due to cyclical factors and the scaling factors needs to be changed;

(2) new information suggests that both the PiT PDs and the long run PDs should be changed; and

(3) new information suggests that the basis of segmentation should be amended.

4.6.16 G The *FCA* expects that, over time, the actual default rates incurred in each segment would form the basis of PD estimates for the segments. However, at the outset, the key calibration issue is likely to be the setting of the initial long-run default rate for each segment, as this will underpin the PD of the entire portfolio for some years to come. A *firm* should apply conservatism in this area and this is something on which the *FCA* is likely to focus on in model reviews.

Governance

4.6.17 G A *firm* should put in place a governance process to provide a judgemental overlay to assess its choices of segments, PD estimates and scalars, both initially and on a continuing basis. Moreover, where the basis of its estimation is a formulaic approach, the *FCA* considers that the act of either accepting or adjusting the estimate suggested by the formula would represent the exercise of judgement.

4.6.18 G A *firm* should consider what use it can make of industry information. However, the *firm* should be seeking to measure the absolute level of, and changes to, its own default risk, rather than changes in default risk relative to the industry. Given the potential for conditions to change across in the

market as a whole, a *firm* should not draw undue comfort from the observation that its default risk is changing in the same way as the industry as a whole. Doing so would not allow it to meet Principle 1 in ■ IFPRU 4.6.5 G.

Data considerations

4.6.19 G The *FCA* expects a *firm* to consider the following issues when seeking to apply a variable scalar approach for UK mortgages:

(1) in respect of Principle 2 (■ IFPRU 4.6.5 G), the commonly used Council for Mortgage Lenders database was based on arrears data and not defaults during a period, and the use of these data without further analysis and adjustment can undermine the accuracy of any calculations; and

(2) in respect of Principle 3 (■ IFPRU 4.6.5 G), the historical data time period chosen for use in the calculations will vary the long-run PDs, and thus *own funds requirements*, when there is no change in the underlying risk.

4.6.20 G The *FCA* expects a *firm* that is including mortgage arrears data as a proxy for default data to:

(1) carry out sensitivity analysis identifying the circumstances in which the assumption that arrears may be used as a proxy for default would produce inaccuracy in long-run PD estimates;

(2) set a standard for what might constitute a potentially significant level of inaccuracy, and demonstrate why, in practice, the use of this proxy would not result in any significant inaccuracy;

(3) establish a process for assessing the ongoing potential for inaccuracy, including thresholds beyond which the level of inaccuracy may no longer be insignificant; and

(4) consider the use of conservative adjustments to address the potential inaccuracy.

4.6.21 G When using historical mortgage data as a key input into variable scalar models, the *FCA* expects a *firm* to:

(1) carry out sensitivity analysis identifying the implications of using different cut-off dates for the start of the reference data set; and

(2) justify the appropriateness of its choice of cut-off date.

Retail exposures: obligor level definition of default

4.6.22 G Where a *firm* has not chosen to apply the definition of default at the level of an individual credit facility in accordance with article 178(1) of the *UK CRR*, the *FCA* expects it to ensure that the PD associated with unsecured *exposures* is not understated as a result of the presence of any collateralised *exposures*.

4.6.23 G The *FCA* expects the PD of a residential mortgage would typically be lower than the PD of an unsecured loan to the same borrower (see article 178(1) of the *UK CRR*).

Retail exposures: facility level definition of default

4.6.24 G Where a *firm* chooses to apply the definition of default at the level of an individual credit facility, in accordance with article 178(1) of the *UK CRR*, and a customer has defaulted on a facility, then default on that facility is likely to influence the PD assigned to that customer on other facilities. The *FCA* expects a *firm* to take this into account in its estimates of PD (see article 178(1) of the *UK CRR*).

Multi-country mid-market corporate PD models

4.6.25 G To ensure that a rating system provides a meaningful differentiation of risk and accurate and consistent quantitative estimates of risk, the *FCA* expects a *firm* to develop country-specific mid-market PD models. Where a *firm* develops multi-country mid-market PD models, the *FCA* expects the *firm* to be able to demonstrate that the model rank orders risk and predicts default rates for each country where it is to be used for *own funds requirements* calculation.

4.6.26 G The *FCA* expects a *firm* to have challenging standards in place to meaningfully assess whether a model rank orders risk and accurately predict default rates. These standards should specify the number of defaults that are needed for a meaningful assessment to be done.

4.6.27 G The *FCA* expects a *firm* to assess the model's ability to predict default rates using a time series of data (ie, not only based on one year of default data).

4.6.28 G In the *FCA's* view, a model is not likely to be compliant where the *firm* cannot demonstrate that it rank orders risk and predicts default rates for each country, regardless of any apparent conservatism in the model.

Use of external rating agency grades

4.6.29 G The *FCA* expects a *firm* using a rating agency grades as the primary driver in its IRB models to be able to demonstrate (and document) compliance with the following criteria:

(1) the *firm* has its own internal rating scale;

(2) the *firm* has a system and processes in place that allow it to continuously collect and analyse all relevant information, and the 'other relevant information' considered by the *firm* in accordance with article 171(2) of the *UK CRR* reflects the information collected and analysed by the *firm* when extending credit to new or existing obligors;

(3) the 'other relevant information' considered by the *firm* is included in an IRB model in a transparent and objective way and is subject to

challenge. The *FCA* expects the *firm* to be able to demonstrate what information was used and why, how it was included and, if no additional information is included, to be able to document what information was discarded and why;

(4) the development of final grades includes the following steps:

(a) the *firm* takes into account all available information (eg,external agency grades and any 'other relevant information') prior to allocating obligors to internal grades and does not automatically assign obligors to grades based on the rating agency grade;

(b) any overrides are applied to these grades; and

(c) the *firm* has a system and processes in place that allows it to continuously collect and analyse final rating overrides;

(5) the grades to which obligors are assigned is reassessed at least annually. The *firm* is able to demonstrate how the grades are reassessed on a more frequent than annual basis when new relevant information becomes available;

(6) the *firm* can demonstrate that a modelling approach is being applied, both in terms of the choice of the rating agency grade as the primary driver and, where information is found materially and consistently to add to the internal rating grade, that they have incorporated this information as an additional driver. The *FCA* expects this work to be analytical (rather than entirely subjective) and could form part of the annual independent review of the model.

4.6.30 G In the *FCA's* view, if a *firm* does not have any additional information to add to the external ratings for the significant part of its portfolio then it will not be meeting the requirements for using an IRB approach.

Low default portfolios

4.6.31 G The *FCA* expects a *firm* to estimate PD for a rating system in line with this section where the *firm's* internal experience of defaults for that rating system was 20 defaults or fewer, and reliable estimates of PD cannot be derived from external sources of default data, including the use of market price-related data. In PD estimation for all *exposures* covered by the rating system, the *FCA* expects the *firm* to:

(1) use a statistical technique to derive the distribution of defaults implied by the *firm's* experience, estimating PDs (the "statistical PD") from the upper bound of a confidence interval set by the *firm* to produce conservative estimates of PDs in accordance with article 179(f) of the *UK CRR*;

(2) use a statistical techniques to derive the distribution of default which takes account, as a minimum, of the following modelling issues:

(a) the number of defaults and number of obligor years in the sample;

(b) the number of years from which the sample was drawn;

(c) the interdependence between default events for individual obligors;

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(d) the interdependence between default rates for different years; and

(e) the choice of the statistical estimators and the associated distributions and confidence intervals;

(3) further adjust the statistical PD to the extent necessary to take account of the following:

(a) any likely differences between the observed default rates over the period covered by the *firm's* default experience and the long-run PD for each grade required by article 180(1)(a) and (2)(a) of the *UK CRR*; and

(b) any other information that indicates (taking into account the robustness and cogency of that information) that the statistical PD is likely to be an inaccurate estimate of PD.

4.6.32 G The *FCA* expects a *firm* to take into account only defaults that occurred during periods that are relevant to the validation under the *UK CRR* of the model or other rating system in question when determining whether there are 20 defaults or fewer.

Supervisory slotting criteria for specialised lending

4.6.33 G The *FCA* expects a *firm* to assign *exposures* to the risk weight category for specialised lending *exposures* based on the criteria set out in the tables in IFPRU 4 Annex 1G(Slotting criteria).

4.7 Internal ratings based approach: loss given default

Negative LGDs

4.7.1 G The *FCA* expects a *firm* to ensure that no LGD estimate is less than zero.

Low LGDs

4.7.2 G The *FCA* does not expect a *firm* to be using zero LGD estimates in cases other than where it had cash collateral supporting the *exposures*.

4.7.3 G The *FCA* expects a *firm* to justify any low LGD estimates using analysis on volatility of sources of recovery, notably on collateral, and cures (see IFPRU 4.7.5 G). This includes:

(1) recognising that the impact of collateral volatility on low LGDs is asymmetric, as surpluses over amounts owed need to be returned to borrowers and that this effect may be more pronounced when estimating downturn, rather than normal period LGDs; and

(2) recognising the costs and discount rate associated with realisations and the requirements of article 181(1)(e) of the *UK CRR*.

4.7.4 G To ensure that the impact of collateral volatility is taken into account, the *FCA* expects a *firm's* LGD framework to include non-zero LGD floors which are not solely related to administration costs (see article 179(1)(f) of the *UK CRR*).

Treatment of cures

4.7.5 G Where a *firm* wishes to include cures in its LGD estimates, the *FCA* expects it to do this on a cautious basis, with reference to both its current experience and how this is expected to change in downturn conditions. In particular, this involves being able to articulate clearly both the precise course of events that will allow such cures to take place and any consequences of such actions for other elements of its risk quantification. For example:

(1) where cures are driven by the *firm's* own policies, the *FCA* expects the *firm* to consider whether this is likely to result in longer realisation periods and larger forced sale discounts for those *exposures* that do not cure, and higher default rates on the book as a whole, relative to those that might be expected to result from a less accommodating

attitude. To the extent feasible, the *FCA* expects cure assumptions in a downturn to be supported by relevant historical data;

(2) the *FCA* expects a *firm* to be aware of, and properly account for, the link between cures and subsequent defaults. In particular, an earlier cure definition is, other things being equal, likely to result in a higher level of subsequent defaults.

[**Note**: article 5(2) of the *UK CRR*]

Incomplete workouts

4.7.6 G To ensure that estimates of LGDs take into account the most up-to-date experience, the *FCA* expects a *firm* to take account of data for relevant incomplete workouts (ie, defaulted *exposures* for which the recovery process is still in progress, with the result that the final realised losses in respect of those *exposures* are not yet certain) (see article 179(1)(c) of the *UK CRR*).

LGD: sovereign floor

4.7.7 G To ensure that sovereign LGD models are sufficiently conservative in view of the estimation error that may arise from the lack of data on losses to sovereigns, the *FCA* expects a *firm* to apply a 45% LGD floor to each unsecured *exposure* in the sovereign asset class (see article 179(1)(a) of the *UK CRR*).

LGD: UK retail mortgage property sales reference point

4.7.8 G The *FCA* believes that an average reduction in property sales prices of 40% from their peak price, prior to the market downturn, forms an appropriate reference point when assessing downturn LGD for *UK* mortgage portfolios. This reduction captures both a fall in the value of the property due to house price deflation, as well as a distressed forced sale discount.

4.7.9 G Where a *firm* adjusts assumed house price values within its LGD models to take account of current market conditions (for example, appropriate house price indices), the *FCA* recognises that realised falls in market values may be captured automatically. A *firm* adopting such approaches may remove observed house price falls from its downturn house price adjustment so as not to double count. A *firm* wishing to apply such an approach must seek the consent of the *FCA* and be able to demonstrate that the following criteria are met:

(1) the adjustment applied to the market value decline element of a *firm's* LGD model is explicitly derived from the decrease in indexed property prices (ie, the process is formulaic, not judgemental);

(2) the output from the adjusted model has been assessed against the 40% peak-to-trough property sales prices decrease reference point (after inclusion of a forced sale discount);

(3) a minimum 5% market value decline applies at all times in the LGD model; and

(4) the *firm* has set a level for reassessment of the property market price decline from its peak. For example, if a *firm* had initially assumed a peak-to-trough market decline of 15%, then it will have set a level of market value decline where this assumption will be reassessed (see article 181(1)(b) of the *UK CRR*).

Downturn LGDs

4.7.10 G To ensure that its LGD estimates are oriented towards downturn conditions, the *FCA* expects a *firm* to have a process through which it:

(1) identifies appropriate downturn conditions for each IRB *exposure* class within each jurisdiction;

(2) identifies adverse dependencies, if any, between default rates and recovery rates; and

(3) incorporates adverse dependencies, if identified, between default rates and recovery rates in the *firm's* estimates of LGD in a manner that meets the requirements relating to an economic downturn (see article 181(1)(b) of the *UK CRR*).

Discounting cashflows

4.7.11 G To ensure that its LGD estimates incorporate material discount effects, the *FCA* expects a *firm's* methods for discounting cash flows to take account of the uncertainties associated with the receipt of recoveries for a defaulted *exposure*. For example, by adjusting cash flows to certainty-equivalents or by using a discount rate that embodies an appropriate risk premium; or by a combination of the two.

4.7.12 G If a *firm* intends to use a discount rate that does not take full account of the uncertainty in recoveries, the *FCA* expects it to be able to explain how it has otherwise taken into account that uncertainty for the purposes of calculating LGDs. This can be addressed by adjusting cash flows to certainty-equivalents or by using a discount rate that embodies an appropriate risk premium for defaulted assets, or by a combination of the two (see article 5(2) of the *UK CRR*).

Wholesale LGD

4.7.13 G The *FCA* expects a *firm* using advanced IRB approaches to have done the following in respect of wholesale LGD estimates:

(1) applied LGD estimates at transaction level;

(2) ensured that all LGD estimates (both downturn and non-downturn) are cautious, conservative and justifiable, given the paucity of observations. Under article 179(1)(a) of the *UK CRR*, estimates must be derived using both historical experience and empirical evidence, and not be based purely on judgemental consideration. The *FCA* expects the justification as to why the *firm* thinks the estimates are conservative to be documented;

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(3) identified and explained at a granular level how each estimate has been derived. This should include an explanation of how internal data, external data, expert judgement or a combination of these has been used to produce the estimate;

(4) clearly documented the process for determining and reviewing estimates, and the parties involved in this process in cases where expert judgement has been used;

(5) demonstrated an understanding of the impact of the economic cycle on collateral values and be able to use that understanding in deriving their downturn LGD estimates;

(6) demonstrated sufficient understanding of any external benchmarks used and identified the extent of their relevance and suitability to the extent that the *firm* can satisfy itself that they are fit for purpose;

(7) evidenced that it is aware of any weaknesses in its estimation process and have set standards, for example related to accuracy, that their estimates are designed to meet;

(8) demonstrated that it has sought and utilised relevant and appropriate external data, including through identifying all relevant drivers of LGD and how these will be affected by a downturn;

(9) ensured, in most cases, estimates incorporate effective discrimination on the basis of at least security-type and geography. In cases where these drivers are not incorporated into LGD estimates, the *FCA* expects the *firm* to be able to demonstrate why they are not relevant;

(10) have an ongoing data collection framework to collect all relevant internal loss and *exposure* data required for estimating LGD and a framework to start using these data as soon as any meaningful information becomes available;

(11) ensure it can articulate the data the *firm* intends to use from any industry-wide data collection exercises that it is participating in, and how the data will be used.

4.7.14 G The *FCA* uses a framework for assessing the conservatism of a *firm's* wholesale LGD models for which there are a low number of defaults. This framework is set out in ■ IFPRU 4 Annex 2G (Wholesale LGD and EAD framework) and does not apply to sovereign LGD estimates which are floored at 45%. This framework is also in the process of being used to assess the calibration of a *firm's* material LGD-models for low-default portfolios.

4.7.15 G In the following cases, the *FCA* expects a *firm* to determine the effect of applying the framework in ■ IFPRU 4 Annex 2G (Wholesale LGD and EAD framework) to models which include LGD values that are based on fewer than 20 'relevant' data points (as defined in ■ IFPRU 4 Annex 2G):

(1) the model is identified for review by the *FCA*; or

(2) the *firm* submits a request for approval for a material change to its LGD model.

Unexpected loss on defaulted assets

4.7.16 G The *FCA* considers that both of the following approaches in relation to calculating unexpected loss of defaulted assets are acceptable in principle:

(1) the independent calculation approach; and

(2) subtraction of the best estimate of expected loss from post-default LGD.

4.7.17 G Where an independent calculation approach is adopted for the calculation of unexpected loss on defaulted assets, the *FCA* expects a *firm* to ensure that estimates are at least equal, at a portfolio level, to a 100% risk weight, ie, 8% capital requirement on the amount outstanding net of provisions (see article 181(1)(h) of the *UK CRR*).

Unsecured LGDs where the borrowers' assets are substantially collateralised

4.7.18 G The extent to which a borrower's assets are already given as collateral will clearly affect the recoveries available to unsecured creditors. If the degree to which assets are pledged is substantial, this will be a material driver of LGDs on such *exposures*. Although potentially present in all transactions, the *FCA* expects a *firm* to be particularly aware of this driver in situations in which borrowing on a secured basis is the normal form of financing, leaving relatively few assets available for the unsecured debt. Specialist lending (including property), hedge fund, and some SME/mid-market lending can be considered such cases.

4.7.19 G The *FCA* expects a *firm* to take into account the effect of assets being substantially used as collateral for other obligations estimating LGDs for borrowers for which this is the case. The *FCA* expects a *firm* not to use unadjusted data sets that ignore this impact, and note that it is an estimate for downturn conditions that is normally required. In the absence of relevant data to estimate this effect, conservative LGDs potentially of 100% are expected to be used (see articles 171(2) and 179(1)(a) of the *UK CRR*).

4.8 Internal ratings based approach: own estimates of exposure at default (EAD)

Estimation of EAD in place of conversion factors

4.8.1 G The *FCA* considers that a *firm* may provide own estimates of *exposure* at default (EAD) in place of the own estimates of conversion factors (CFs) that it is permitted or required to provide under article 151 of the *UK CRR*.

4.8.2 G For the purpose of this section, references to EAD refer to both direct estimates of EAD and CFs, unless specified otherwise (see article 151 of the *UK CRR*).

General expectations for estimating EAD

4.8.3 G The *FCA* expects that EAD estimates should not be less than current drawings (including interest accrued to date). Consequently, CF estimates should not be less than zero.

4.8.4 G The EAD required for IRB purposes is the *exposure* expected to be outstanding under a borrower's current facilities should it go into default in the next year, assuming that economic downturn conditions occur in the next year and a *firm's* policies and practices for controlling *exposures* remain unchanged other than changes that result for the economic downturn conditions.

4.8.5 G To achieve sufficient coverage of the EAD, the *FCA* expects *firms* to take into account all facility types that may result in an *exposure* when an obligor defaults, including uncommitted facilities.

4.8.6 G To the extent that a *firm* makes available multiple facilities, the *FCA* expects the *firm* to be able to demonstrate:

(1) how they deal with the fact that *exposures* on one facility may become *exposures* under another on which the losses are ultimately incurred; and

(2) the impact of its approach on its *own funds requirements*.

4.8.7 G The *FCA* expects *firms* using own estimates of EAD to have done the following in respect of EAD estimates:

(1) applied EAD estimates at the level of the individual facility;

(2) where there is a paucity of observations, ensured that all EAD estimates are cautious, conservative and justifiable. In accordance with article 179(1)(a) of the *UK CRR*, estimates must be derived using both historical experience and empirical evidence, and must not be based purely on judgemental consideration. The *FCA* expects the justification as to why the *firm* thinks the estimates are conservative to be documented;

(3) identified and explained at a granular level how each estimate has been derived. This should include an explanation of how internal data, any external data, expert judgement or a combination of these has been used to produce the estimate;

(4) ensured that where expert judgement has been used there is clear communication of the process for arriving at and reviewing the estimates, and identifying the parties involved;

(5) demonstrated an understanding of the impact of the economic cycle on exposure values and be able to use that understanding in deriving downturn EAD estimates;

(6) demonstrated sufficient understanding of any external benchmarks used and identified the extent of their relevance and suitability to the extent that the *firm* can satisfy itself that they are fit for purpose;

(7) evidenced that they are aware of any weaknesses in their estimation process and have set standards that their estimates are designed to meet (eg, related to accuracy);

(8) ensured, in most cases, that estimates incorporate effective discrimination on the basis of at least product features and customer type. In cases where these drivers are not incorporated into EAD estimates, the *FCA* expects the *firm* to be able to demonstrate why they are not relevant;

(9) have an ongoing data collection framework to collect all relevant internal *exposure* data required for estimating EAD and a framework to start using this data as soon as any meaningful information becomes available;

(10) made use of the data they are collecting to identify all relevant drivers of EAD and to understand how these drivers will be affected by a downturn; and

(11) identified dependencies between default rates and conversion factors for various products and markets when estimating downturn EADs. *Firms* are expected to consider how they expect their own policies regarding exposure management to evolve in a downturn.

4.8.8 G The *FCA* uses a framework for assessing the conservatism of *firms*' wholesale EAD models for which there are a low number of defaults. This framework is set out in ■ IFPRU 4 Annex 2G (Wholesale LGD and EAD framework). This

framework is in the process of being used to assess the calibration of *firms*' material EAD models for low-default portfolios.

4.8.9 G In the following cases, the *FCA* expects *firms* to determine the effect of applying the framework in ■ IFPRU 4 Annex 2G (Wholesale LGD and EAD framework) to models which include EAD values that are based on fewer than 20 'relevant' data points (as defined in ■ IFPRU 4 Annex 2G):

(1) the model is identified for review by the *FCA*; or

(2) the *firm* submits a request for approval for a material change to its EAD model.

Time horizon

4.8.10 G The *FCA* expects *firms* to use a time horizon of one year for EAD estimates, unless they can demonstrate that another period would be more conservative.

4.8.11 G EAD estimates can be undertaken on the basis that default occurs at any time during the time horizon (the 'cohort approach') or at the end of the time horizon (the 'fixed-horizon approach'). The *FCA* considers that either approach is acceptable in principle.

4.8.12 G The *FCA* expects the time horizon for additional drawings to be the same as the time horizon for defaults. This means that EAD estimation need cover only additional drawings that might take place in the next year, such that:

(1) no *own funds requirements* need be held against facilities, or proportions of facilities that cannot be drawn down within the next year; and

(2) where facilities can be drawn down within the next year, *firms* may, in principle, reduce their estimates to the extent that they can demonstrate that they are able and willing, based on a combination of empirical evidence, current policies, and documentary protection to prevent further drawings (see article 182 of the *UK CRR*).

Direct estimates of EAD

4.8.13 G There are a range of approaches that focus on the total amount that will be drawn down at the time of default and directly estimate EAD. Typically, but not in all cases, these will estimate EAD as a percentage of total limit. These approaches can be described collectively as 'momentum' approaches.

4.8.14 G A 'momentum' approach can be used either:

(1) by using the drawings/limit percentage to formulaically derive a conversion factor on the undrawn portion of the limit; or

(2) by using the higher of percentage of the limit and the current balance as the EAD.

4.8.15 G The *FCA* considers that the use of momentum approaches in both of the ways outlined above is acceptable in principle as an alternative to direct estimation of conversion factors (see article 4(56) of the *UK CRR*).

Distortions to conversion factor estimates caused by low undrawn limits

4.8.16 G In cases where *firms* estimate conversion factors (CFs) directly using a reference data set that includes a significant number of high CFs as a result of very low undrawn limits at the observation date, the *FCA* expects *firms* to:

(1) investigate the distribution of realised CFs in the reference data set;

(2) base the estimated CF on an appropriate point along that distribution, that results in the choice of a CF appropriate for the *exposures* to which it is being applied and consistent with the requirement in article 179 of the *UK CRR* for estimates to include a margin of conservatism related to errors; and

(3) be cognisant that, while the median of the distribution might be a starting point, they should not assume without analysis that the median represents a reasonable unbiased estimate. The *FCA* expects *firms* to consider whether the pattern of distribution in realised CFs means that some further segmentation is needed (eg, treating facilities that are close to full utilisations differently) (see article 182(1)(a) of the *UK CRR*).

Identification of exposures for which an EAD must be estimated

4.8.17 G The *FCA* expects *firms* to treat a facility as an *exposure* from the earliest date at which a customer is able to make drawings under it.

4.8.18 G Where the facility is of the type that it is customary not to advise the borrower of its availability, the *FCA* expects an EAD/CF to be applied from the time that the existence of the facility is recorded on the *firm's* systems in a way that would allow the borrower to make a drawing.

4.8.19 G If the availability of a facility is subject to a further credit assessment by the *firm*, an EAD/CF may not be required. However, the *FCA* expects this to be the case only if the subsequent credit assessment was of substantially equivalent rigour to that of the initial credit approval and if this includes a re-rating or a confirmation of the rating of the borrower.

4.8.20 G *Firms* are not expected to include in their EAD/CF estimates the probability of increases in limits between observation and default date. If the reference data set includes the impact of such increases, the *FCA* expects *firms* to be able to adjust their estimates accordingly with the aim of assessing what the *exposure* would have been at default if the limit had not been increased.

4.8.21 G The *FCA* expects *firms* to investigate the incidence of *exposures* existing at default that arise from products or relationships that are not intended to result in a credit exposure and, consequently, have no credit limit established

against them and are not reflected in their estimates of EAD. Unless such *exposures* are immaterial, the *FCA* expects *firms* to estimate a Pillar 1 *own funds requirement* on a portfolio basis to such *exposures*.

4.8.22 G The *FCA* expects *firms* to investigate how their EAD estimates are impacted by exposures that are in excess of limits at either the observation date (if in the reference data set) or at the current reporting date (for the existing book to which estimates need to be applied). Unless a momentum approach is being used, exposures in excess of limit should be excluded from the reference data set (as the undrawn limit is negative and nonsensical answers would result from their inclusion). The *FCA* expects *firms* to ensure that their EAD estimation includes the risk of further drawings on accounts that are in excess of their limits (see article 4(56) of the *UK CRR*).

Accrued interest

4.8.23 G *Exposures* include not only principal amounts borrowed under facilities but also interest accrued which will fluctuate between payment dates. To ensure proper coverage of interest, the *FCA* expects *firms* to take the following approach:

(1) accrued interest to date should be included in current *exposure* for performing *exposures*;

(2) *firms* may choose whether estimated increases in accrued interest up to the time of default should be included in LGD or EAD;

(3) in the estimation of EAD, increases in accrued interest may be offset against reductions in other outstandings;

(4) estimation of changes in accrued interest needs to take account of changes in the contractual interest rate over the time horizon up to default and in a way consistent with the scenario envisaged in the calculation of the downturn/default weighted average;

(5) inclusion of estimates of future post-default interest is not necessary in either EAD or LGD; and

(6) *firms*' accounting policies will determine the extent to which interest accrued to date is reflected in current exposure as opposed to LGD for defaulted *exposures* (see article 166(1) of the *UK CRR*).

Netting

4.8.24 G The *FCA* considers that there is scope within the *UK CRR* for a *firm* to recognise on-balance sheet netting (including in respect of cross-currency balances) through EAD as an alternative to LGD in cases where a *firm* meets the general conditions for on-balance sheet netting, as set out in article 205 of the *UK CRR*.

4.8.25 G For the CF on undrawn limits, this may be applied on the basis of the net limit, provided the conditions in the *UK CRR* for the use of net limits are met. However, *firms* are reminded that the purpose of the measure is to estimate the amount that would be outstanding in the event of a default. This implies that their ability, in practice, to constrain the drawdown of credit balances

will be particularly tested. Moreover, the *FCA* expects the appropriate conversion factor to be higher as a percentage of a net limit than of a gross limit.

4.8.26 G The lower the net limit as a percentage of gross limits or *exposures*, the greater will be the need on the part of the *firm* to ensure that it is restricting *exposures* below net limits in practice and that it will be able to continue to do so should borrowers encounter difficulties. The application of a zero net limit is acceptable in principle but there is, consequently, a very high obligation on the *firm* to ensure that breaches of this are not tolerated (see article 166(3) of the *UK CRR*).

Underwriting commitments

4.8.27 G Estimation of CFs on underwritten facilities in the course of primary market syndication may take account of anticipated sell down to other parties.

4.8.28 G *Firms* are reminded that, since the basis of EAD estimation is that default by the borrower is expected to take place in a one-year time horizon and quite possibly in downturn conditions, the *FCA* expects any reduction in their CF in anticipation of syndication to take account of this scenario (see article 4(56) of the *UK CRR*).

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4.9 Stress tests

Stress tests used in assessment of capital adequacy

4.9.1 G To be satisfied that the credit risk stress test undertaken by a *firm* under article 177(2) of the *UK CRR* is meaningful and considers the effects of severe, but plausible, recession scenarios, the *FCA* would expect the stress test to be based on an economic cycle that is consistent with IFPRU 2.2.73G(1)(b) (see article 177(2) of the *UK CRR*)

4.10 Validation

4.10.1 G The *FCA* expects a *firm* to have a validation process that includes the following:

(1) standards of objectivity, accuracy, stability and conservatism that it designs its ratings systems to meet and processes that establish whether its rating systems meet those standards;

(2) standards of accuracy of calibration (ie, whether outcomes are consistent with estimates) and discriminative power (ie, the ability to rank-order risk) that it designs its rating systems to meet and processes that establish whether its rating systems meet those standards;

(3) policies and standards that specify the actions to be taken when a rating system fails to meet its specified standards of accuracy and discriminative power;

(4) a mix of developmental evidence, benchmarking and process verification and policies on how this mixture varies between different rating systems;

(5) use of both quantitative and qualitative techniques;

(6) policies on how validation procedures are expected to vary over time; and

(7) ensuring independent input into, and review of, its rating systems (see article 188 of the *UK CRR*).

4.10.2 G In IFPRU 4.10.1 G:

(1) developmental evidence means evidence that substantiates whether the logic and quality of a rating system (including the quantification process) adequately discriminates between different levels of, and delivers accurate estimates of, PD, EL, LGD and conversion factors (as applicable); and

(2) process verification means the process of establishing whether the methods used in a rating system to discriminate between different levels of risk and to quantify PD, EL, LGD and conversion factors are being used, monitored and updated in the way intended in the design of the rating system (see article 188 of the *UK CRR*).

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4.10.3 G The *FCA* expects a *firm* to be able to explain the performance of its rating systems against its chosen measure (or measures) of discriminative power. In making this comparison, a *firm* should rely primarily on actual historic default experience where this is available. In particular, the *FCA* expects a *firm* to be able to explain the extent of any potential inaccuracy in these measures, caused, in particular, by small sample size and the potential for divergence in the future, whether caused by changing economic conditions or other factors. *Firms*' assessment of discriminative power should include appropriate use of external benchmarks where available.

4.10.4 G The *FCA* will take into consideration the sophistication of the measure of discrimination chosen when assessing the adequacy of a rating system's performance.

4.10.5 G In the case of a portfolio for which there is insufficient default experience to provide any confidence in statistical measures of discriminative power, the *FCA* expects a *firm* to use other methods. For example, analysis of whether the *firm's* rating systems and an external measurement approach (eg, external ratings) rank common obligors in broadly similar ways. Where such an approach is used, the *FCA* would expect a *firm* to ensure it does not systematically adjust its individual ratings with the objective of making them closer to the external ratings as this would be counter to the philosophy of an internal rating approach. The *FCA* expects a *firm* to be able to explain the methodology it uses and the rationale for its use.

4.11 Income-producing real estate portfolios

Compliance with UK CRR

4.11.1 G The *FCA* considers that income-producing real estate (IPRE) is a particularly difficult asset class for which to build effective rating systems that are compliant with the requirements of the internal ratings based (IRB) approach.

4.11.2 G As with all asset classes, *firms* should assess whether their IPRE model is *UK CRR* compliant and not whether it is the nearest they can get to compliance given the constraints imposed on their model development (eg, lack of data or resource constraints).

4.11.3 G Where material non-compliance is identified and cannot be remediated in a timely fashion, *firms* should adopt a compliant approach for calculating *own funds requirements*. In most cases, this is likely to be the slotting approach (see article 144(1) of the *UK CRR*).

Drivers of risk

4.11.4 G *Firms* should be able to demonstrate that the model drivers selected offer sufficient discriminatory power and to justify why other potential data sources are not expected to materially improve the discriminatory power and accuracy of estimates.

4.11.5 G The *FCA* expects that an IPRE rating system will only be compliant if a *firm* is able to demonstrate the following in respect of its treatment of cash flows (except where the *firm* can demonstrate that this is not an appropriate risk driver):

(1) the difference in deal ratings when tenant ratings are altered is intuitive;

(2) the transformation of ratings into non-rent payment probability is intuitive. Even where tenants are rated by the *firm* the PD will not usually represent a direct read across to probability of non-payment due to, for example, model philosophy issues. Addressing this is likely to be a key area since many *firms* struggle with defining what divergence is expected between observed default rate and PD in different economic conditions in the mid corporate space;

(3) the selection of parameter values and/or distributions, and their impact on deal ratings, is well supported and intuitive;

(4) the impact on the deal rating is intuitive for such features as type of building, geographical location and building quality; and

(5) where data are missing or unavailable the treatment is conservative.

4.11.6 G The *FCA* expects that an IPRE rating system will only be compliant if a *firm* is able to demonstrate the following in respect of its treatment of interest-rate risk (IRR):

(1) IRR is included as a relevant risk driver (unless the portfolio is exclusively hedged);

(2) the way in which IRR is included in the deal rating is intuitive with respect to model philosophy. For example, a 'point in time' rating should consider the current interest rate and likely change over a one-year time horizon, whereas a 'through-the-cycle' model needs to consider the IRR averaged over an economic cycle; and

(3) the model rates deals where IRR is hedged by the *firm* differently from deals where IRR is unhedged and the magnitude of the difference in these ratings is intuitive.

4.11.7 G The *FCA* expects that an IPRE rating system will only be compliant if a *firm* is able to demonstrate the following in respect of its treatment of refinance risk:

(1) refinance risk is included as a relevant risk driver (unless the portfolio contains only amortising loans);

(2) the model rates interest only and amortising deals differently in the final year and that the magnitude of the difference in these ratings is intuitive;

(3) given the time horizon associated with IRB estimates (ie 12 months), the refinance risk could have a zero weight until the deal enters its final year for point-in-time models. In these cases, the risk should be captured in stress testing and Pillar 2; and

(4) the *firm* is able to report by borrowers that have previously had a distressed restructuring unlikeliness to pay indicator (even if they are now performing) by number, EAD and risk weighted exposure amounts.

Calibration

4.11.8 G The *FCA* expects that *firms* will not be compliant with the calibration requirements relating to use of a long-run default rate, unless it can demonstrate that:

(1) the internal data series is the longest relevant and accurate data series, on a *UK CRR* compliant definition of default, that is available;

(2) the determination of long-run default rate includes reference to an appropriate source of downturn data (this may require the use of external data);

(3) the relevance of any external data used is analysed, and the relationship between internal default data and the external data used is considered over a multi-year period; and

(4) where uncertainty is introduced due to, for example, the quality of internal data or shortcomings in the relevance of external data, a conservative adjustment to the estimates should be made.

4.11.9 G The *FCA* expects that a *firm* will only be compliant with the calibration requirements relating to model philosophy if it can demonstrate that:

(1) the model philosophy is clearly articulated and justified. Justification should include analysis of the performance of assets, and the corresponding ratings assigned, over a change in economic conditions (ie, as long as period as possible); and

(2) in addition to encapsulating this information in a coherent way in the calibration, the impact of capturing risks such as IRR and refinance risk is clearly documented.

Low default portfolios

4.11.10 G Where the rating system is classed as a low default portfolio in accordance with the *guidance* in this section, a *firm* should be able to demonstrate that the framework applied adequately considers:

(1) economic environment of data used;

(2) changes in portfolio composition over time;

(3) parameter choices; and

(4) model philosophy.

Constructed theoretically

4.11.11 G Under article 144(1) of the *UK CRR*, all models, including those constructed from a theoretical basis without reference to any empirical default data (such as Monte-Carlo cash-flow simulation models), must meet the IRB requirements that are set out in Title II Chapter 3 of Part Three of the *UK CRR* (IRB approach).

4.11.12 G The *FCA* considers that, to meet the requirements referred to in IFPRU 4.11.1 G, it will be necessary for *firms* to demonstrate that a *firm* has a good understanding of PD models that are constructed theoretically and that the parameter estimates reflect a one-year PD. In addition, even if empirical data were not used to determine the PD estimate it should, where available, be used to back-test the estimates.

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4.11.13 G The *FCA* expects that, as most models of this type will be able to produce one-year estimates of PD that correspond closely to point-in-time estimates, *firms* should conduct robust back-testing of such estimates by comparing them with realised default rates. *Firms* would need to demonstrate that the results of such back-testing meet pre-defined and stringent standards in order for the *FCA* to be satisfied that the IRB requirements are met.

4.11.14 G Because assumptions in the model build process are likely to materially impact the resulting PDs, the *FCA* would expect these choices to be clearly justified in the model documentation and to have been independently reviewed. To be satisfied that a *firm* is complying with article 176(1)(d) of the *UK CRR*, the *FCA* expects a *firm* to support justification for all assumptions with analysis of the sensitivity of the model outputs to changes in the assumptions.

4.11.15 G Where the *firm* has fewerthan 20 defaults in their internal data set, the *FCA* expects it to be necessary for *firms* to perform a statistical low default portfolio calibration, as set out in the *guidance* in this section.

Validation

4.11.16 G The *FCA* expects that a *firm* will be compliant with the validation requirements only whereit can demonstrate, in respect of discriminatory power, that:

(1) appropriate minimum standards that the rating system is expected to reach are defined, together with reasoning behind the adoption of such standards and that the factors considered when determining the tests are clearly documented;

(2) an objective rank-ordering metric, measured using an appropriate time horizon (eg, using ratings one year prior to default) or cohort approach, such as Gini or Accuracy Ratio of 50% is achieved over time;

(3) where there are sufficient defaults from different time periods the discriminatory power is shown to have reached the appropriate minimum standard over an extended time period (ie, longest period possible, including most recent data); and

(4) any concentrations in ratings from the model are demonstrated to be appropriate.

4.11.17 G The *FCA* expects that a *firm* will be compliant with the validation requirements only whereit can demonstrate in respect of the calibration that:

(1) observed default rate versus PD is considered at grade level and across a range of economic environments (ie, as long as period as possible);

(2) where the PD does not relate to a pure point-in-time estimate, either the PD or the observed default rate is transformed such that comparison between the two is meaningful. This transformation

should be consistent with the model philosophy and calibration technique applied; and

(3) pre-defined tolerances for the degree of divergence, and the associated actions for what should happen when they are not met, are set.

4.11.18 G The *FCA* also expects that a *firm* will be compliant with the validation requirements only whereit can demonstrate that:

(1) appropriate stability metrics should be considered across a range of economic environments (ie, longest period possible including most recent data);

(2) the tolerances for the degree of divergence, and associated actions for what should happen when they are not met, is pre-defined; and

(3) subsections of portfolios by characteristics affecting risk profile, and therefore potentially model performance, are investigated. Such subsections could include:

(a) loan type (amortising/interest only);

(b) degree of hedging;

(c) building type; and

(d) other factors such as non-SPV (special purpose vehicle) lending in a predominately SPV lending book or vice versa (see article 188 of the *UK CRR*).

Other requirements

4.11.19 G The *FCA* expects that a *firm* will be able to comply with certain other *UK CRR* requirements only where it candemonstrate that:

(1) in relation to article 144(1)(e) of the *UK CRR*, where more than one model is used, the rationale, and the associated boundary issues, is clearly articulated and justified and the criteria for assigning an asset to a rating model are objective and clear;

(2) in relation to article 173(1)(c) of the *UK CRR*, the *firm* has a process in place to ensure valuations of the property are appropriate and up to date;

(3) in relation to article 171(2) of the *UK CRR*, the *firm* makes reference to information available from the Investment Property Databank where relevant. Where this data is utilised at a broad level when more granular data is available this is fully justified with appropriate analysis;

(4) in relation to article 173(1)(b) of the *UK CRR*, the rating histories demonstrate that deals are re-rated every time material information becomes available, for example where the deal enters its final year (and refinance risk becomes relevant) or a tenant defaults, is replaced or has their rating changed;

(5) in relation to article 189(3) of the *UK CRR*, management information covering all aspects required by the *UK CRR* is produced and reviewed regularly by *senior management* and the tolerances for the degree of divergence, and associated actions for what should happen when they are not met, are pre-defined; and

(6) in relation to article 177(2) of the *UK CRR*, the impact on PDs and risk-weighted exposure amounts in a *firm's* credit risk stress test is consistent with model philosophy (although ratings should be affected by events such as tenant defaults even if they are TTC) and impairment projections are justified with reference to past internal data.

4.12 Securitisation

Recognition of significant risk transfer

4.12.1 R

(1) A *firm* must notify the *FCA* that it is relying on the deemed transfer of significant credit risk under article 244(2) of the *UK CRR* (Traditional securitisation) or article 245(2) of the *UK CRR* (Synthetic securitisation), including when this is for the purposes of article 337(5) of the *UK CRR*, no later than one month after the date of the transfer.

(2) The notification in (1) must include sufficient information to allow the *FCA* to assess whether the possible reduction in risk-weighted exposure amounts which would be achieved by the *securitisation* is justified by a commensurate transfer of credit risk to third parties.

Significant risk transfer notifications and permissions

4.12.2 G

An *originator* of *securitisations* is able to use the *securitisation* risk weights (and not calculate *own funds requirements* on the assets underlying its *securitisation*) in either of the following cases:

(1) the *firm* transfers significant credit risk associated with the *securitised exposures* to third parties; or

(2) the *firm* deducts from *common equity tier 1 capital* or applies a 1250% risk weight to all positions it holds in the *securitisation*.

4.12.3 G

The significant risk transfer requirements in articles 244 (Traditional securitisation) or 245 (Synthetic securitisation) of the *UK CRR* provide three options for a *firm* to demonstrate how it transfers significant credit risk for any given transaction:

(1) the *originator* does not retain more than 50% of the risk-weighted exposure amounts of mezzanine *securitisation positions* (as defined in article 242(18) of the *UK CRR*), where these are:

(a) *securitisation positions* to which a risk weight lower than 1250% and higher than 25% applies in accordance with Sub-Sections 2 and 3 of Section 3 of Chapter 5 (Securitisation) of the *UK CRR*; and

(b) subordinated to the senior *securitisation position* and more senior than the first loss tranche;

(2) where there is no mezzanine position, the *originator* does not hold more than 20% of the *exposure* values of *securitisation positions* that

are subject to a deduction or 1250% risk weight and where the *originator* can demonstrate that the *exposure* value of such *securitisation positions* exceeds a reasoned estimate of the expected loss on the *securitised exposures* by a substantial margin; and

(3) the *competent authority* may grant permission to an *originator* to make its own assessment if it is satisfied that the *originator* can meet certain requirements.

Significant risk transfer under options 1 and 2

4.12.4 G ■ IFPRU 4.12.1 R requires a *firm* to notify the *FCA* of each transaction on which it seeks capital relief under the options in ■ IFPRU 4.12.3 G (1) (option 1) and (2) (option 2).

4.12.5 G Where the *FCA* considers that the possible reduction in risk-weighted exposure amounts (RWEA) achieved via the *securitisation* is not justified by a commensurate transfer of credit risk to third parties, significant risk transfer will be considered to not have been achieved. Consequently, a *firm* will not be able to recognise any reduction in RWEA due to the transaction.

Option 3

4.12.6 G For ■ IFPRU 4.12.3 G (3) (option 3), the *FCA* intends to grant permission for an *originator* to make its own assessment of significant risk transfer only where it is satisfied that:

(1) in every relevant case, the reduction in *own funds requirements* achieved would be justified by a commensurate transfer of risk to third parties;

(2) the *firm* has adequate internal risk management policies and methodologies to assess the transfer of risk; and

(3) such transfer of risk to third parties is also recognised for the purposes of the *firm's* internal risk management and internal capital allocation.

4.12.7 G Where the *FCA* grants permission for multiple transactions, then that permission is expected to cover a defined scope of potential transactions. The permission is expected to enable a *firm* (within certain limits) to carry out these transactions without notifying the *FCA* in each individual instance.

Deduction or 1250% risk weighting

4.12.8 G A *firm* seeking to achieve capital relief by deducting or applying a 1250% risk weight where permitted under articles 244 or 245 of the *UK CRR* does not need to make the notification in ■ IFPRU 4.12.1 R. However, in such cases, a *firm* should consider whether the characteristics of the transaction are such that the *FCA* would reasonably expect prior notice of it.

Significant risk transfer notifications

4.12.9 G Under I■ IFPRU 4.12.1 G, within one *month* of a *securitisation* transaction closing, a *firm* must notify the *FCA* of the transaction if it has relied on options 1 or 2 to achieve significant risk transfer.

4.12.10 G Notification under ■ IFPRU 4.12.1 G should include sufficient information to enable the *FCA* to assess whether the possible reduction in RWEA which would be achieved by the *securitisation* is justified by a commensurate transfer of credit risk to third parties. The *FCA* expects this to include the following:

(1) details of the *securitisation positions*, including rating, *exposure* value and RWEA broken down by *securitisation positions* sold and retained;

(2) key transaction documentation and any relevant supporting documents (eg, a summary of the transaction);

(3) details of the governance process for the transaction, including details of any committees involved in approving the transaction;

(4) a copy of the significant risk transfer policy applied to the transaction, including details of the methodology and any models used to assess risk transfer;

(5) a statement of how all relevant risks are incorporated into the significant risk transfer assessment and how the full economic substance of the transaction is taken into consideration;

(6) the significant risk transfer calculation, setting out why the *firm* believes the capital relief proposed is commensurate with the credit risk transferred to third parties;

(7) the *UK CRR*

(7) requirements the *firm* is relying on;

(8) copies of investor and internal presentations on the transaction;

(9) the rationale for the transaction;

(10) details of the underlying assets (including asset class, geography, tenor, rating, spread, collateral, *exposure* size);

(11) details of the transaction structure;

(12) description of the risks being retained;

(13) details of the cashflow between parties involved in the transaction;

(14) details of the ratings and pricing of bonds issued in the transaction;

(15) details of any connected parties involved in the transaction;

(16) details of any termination options (for example, call options); and

(17) details of reliance on *ECAIs* in the significant risk transfer assessment.

4.12.11 G The *FCA*'s review will focus on the proportion of credit risk transferred, compared to the proportion by which RWEA are reduced in the transaction. Where the *FCA* judges that the reduction in RWEA is not justified by a commensurate transfer of credit risk to third parties, it will inform the *firm* that significant risk transfer has not been achieved by this transaction. Otherwise, the *FCA* will inform the *firm* that it does not object to the transaction.

4.12.12 G The *FCA* does not intend to pre-approve transactions. The *FCA* will provide a view on whether it considers that commensurate risk transfer has been achieved at a point in time, which may be provided after a transaction has closed. The *FCA* may reassess its judgement of the achievement of commensurate risk transfer if the level of credit risk transfer in a transaction changes materially.

Significant risk transfer permissions

4.12.13 G A *firm* may apply for permissions under articles 244 (Traditional securitisation) or 245 (Synthetic securitisation) of the *UK CRR* to consider significant risk transfer to have been achieved without needing to rely on options (1) or (2). The scope of such permission maybe defined to cover a number of transactions or an individual transaction.

Multiple transaction permissions

4.12.14 G Where a *firm* applies for such permission, the *FCA* would expect the scope should be defined according to a range of characteristics, including the type of asset class and the structural features of the transaction. The characteristics the *FCA* would expect a *firm* to consider when scoping a permission application include:

(1) asset class (eg, residential mortgages, commercial mortgages, credit card receivables, leasing, loans to corporates or small and medium-sized enterprises (SMEs), consumer loans, trade receivables, *securitisations*, private finance initiative (PFI), insurance, other assets, covered bonds);

(2) further asset class distinction (eg, geography and asset quality); and

(3) structural features (eg, by distinguishing between securitisation and re-securitisation, traditional and synthetic securitisation and non-revolving structures and revolving structures).

4.12.15 G It is likely for it to be more straightforward for the *FCA* to assess relatively narrowly scoped permissions than those covering a wide range of assets and/or with complex structural features.

Areas of review and information to be submitted for permission

4.12.16 G To assess a *firm's* ability to use its own policies and methodologies for assessing significant risk transfer, the *FCA's* permission reviews will focus on:

(1) the *firm's* understanding of the risk of any potential transactions within permission scope, including for potential underlying assets, *securitisation* structures and other relevant factors that affect the economic substance of risk transfer;

(2) the governance around significant risk transfer assessment (including sign-off procedures) and systems and controls relating to risk-transfer assessment and determination of significant risk transfer;

(3) significant risk transfer calculation policies and methodologies, including any models used;

(4) the *firm's* historical experience with relevant *securitisation* origination; and

(5) the use of third-party risk assessments (eg, *ECAI* ratings) and the relationship with internal assessments.

4.12.17 G The information the *FCA* expects a *firm* to provide in a permission application includes the following:

(1) details of the *firm's* governance processes for significant risk transfer, including details of any relevant committees and the seniority and expertise of key persons involved in sign-off;

(2) a copy of the *firm's* significant risk transfer policy, including details of the significant risk transfer calculation policies, methodologies and any models used to assess risk transfer (this should set out how the *firm* ensures it only takes capital relief in proportion to the amount of risk transferred on any given transaction);

(3) a statement of how all relevant risks are incorporated in the significant risk transfer calculations and how the full economic substance of transactions is taken into consideration;

(4) details of the *firm's* systems and controls regarding risk transfer in *securitisations*;

(5) a copy of the *firm's* capital allocation strategy;

(6) details of any *securitised* assets that have come back on the *firm's* balance sheet and the reason why; and

(7) details of reliance on *ECAIs* in determining significant risk transfer.

Limits attached to multiple transaction permissions: materiality

4.12.18 G The *FCA* intends to apply two materiality limits to the proportion of risk-weighted exposure amount (RWEA) relief that can be taken under any permission covering multiple transactions:

(1) transaction level limit any transaction that would, in principle, be within the scope of the permission, but that resulted in an RWEA reduction exceeding 1% of the *firm's* credit risk-related RWEAs as at the date of the *firm's* most recent regulatory return, will fall outside

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the scope of a multiple transaction permission and will require a separate permission or require notification (if the transaction would satisfy option 1 or 2); and

(2) aggregate limit once the aggregate RWEA reduction taken on all significant risk transfer transactions executed within the scope of a permission exceeds 5% of the *firm's* credit risk-related RWEAs as at the date of the *firm's* most recent regulatory return, no additional transactions may be executed within scope of the permission. In such circumstances, a *firm* should take one of the following actions:

(a) reapply to renew the multiple transaction permission; or

(b) apply for a new permission covering the specific transactions exceeding the RWEA limit; or

(c) notify the *FCA* of the transaction, following the significant risk transfer notification procedure (if the transactions would satisfy option 1 or 2).

Limits attached to multiple transaction permissions: duration of permission

4.12.19 G Multiple transaction permissions can be expected to be granted for a period of one year. The *FCA's* review of permission renewal will focus on any changes to the *firm's* significant risk transfer policies and methodologies since the previous review.

Individual transaction permission

4.12.20 G Permissions relating to individual transactions do not need to be granted prior to the execution of a transaction. The *FCA* does not intend to specify the timeframe in which a *firm* should submit an individual transaction permission, but the *firm* should note that capital relief from a specific transaction will not be available until a *firm* has obtained permission covering the significant risk transfer assessment and capital treatment (unless the transaction is being notified under option 1 or 2, or falls within scope of a multiple transaction permission).

4.12.21 G The information the *FCA* expects to receive in an individual transaction permission includes that in ■ IFPRU 4.12.10G (2) and ■ IFPRU 4.12.10 G (6) to ■ IFPRU 4.12.10 G (17), as well as that in ■ IFPRU 4.12.17G (1) to ■ (3).

Limits attached to individual transaction permissions

4.12.22 G Depending on the nature of a transaction, the *FCA* may grant an individual permission for the duration of the transaction, or may impose a time limit on the permission. Where a *firm* sought to take capital relief on a transaction beyond the expiry date of the relevant permission, the *firm* would need to renew the permission prior to its expiry date.

4.12.23 G Given that significant risk transfer should be met on a continuing basis, permissions will typically include a requirement to notify the *FCA* of any change in circumstances from those under which the permission was granted (eg, where the amount of credit risk transfer had changed materially). Any reduction in credit risk transfer subsequent to the permission being granted

will require the *firm* to take a commensurate reduction in RWEA relief. If a *firm* does not effect a commensurate reduction in the RWEA relief, the *FCA* may revoke the relevant permission.

Regulatory capital calculation methodology and significant risk transfer

4.12.24 G An *originator* must transfer a significant amount of credit risk associated with *securitised exposures* to third parties to be able to apply the *securitisation* risk weights set out in Part Three, Title II, Chapter 5 of the *UK CRR* (Securitisation), and any associated reduction in *own funds requirements* must be matched by a commensurate transfer of risk to third parties.

4.12.25 G As part of the notification and permissions process, the *FCA* expects the *firm* to inform it of the methodology it intends to use to calculate *securitisation* capital requirements.

Implicit support and significant risk transfer

4.12.26 G As part of a *firm's* ongoing consideration of risk transfer, the *FCA* expects it to consider the support it has provided to *securitisation* transactions.

4.12.27 G

(1) If a *firm* is found to have provided support to a *securitisation*, the expectation that the *firm* will provide future support to its securitisations is increased. The *FCA* will take account of this increased expectation in future assessments of commensurate risk transfer to that firm.

(2) The *FCA* expects *securitisation* documentation to make clear, where applicable, that repurchase of *securitisation positions* by the *originator* beyond its contractual obligations is not mandatory and may only be made at fair market value.

(3) Where a *firm* provides support which it is entitled, but not obliged, to provide under the contractual documentation of the *securitisation*, the *FCA* will consider the following factors in assessing if that support has been appropriately reflected in the assessment of significant risk transfer:

(a) whether the fact that the *firm* may provide such support was expressly set out in the contractual and marketing documents for the *securitisation*;

(b) whether the nature of the support that the *firm* may give is precisely described in the documentation;

(c) whether the maximum degree of support that could be provided could be ascertained at the time of the *securitisation* by the *firm* and by a person whose only information came from the marketing documents for the *securitisation*;

(d) whether the assessment of whether significant risk transfer was achieved and the amount of that risk transferred was made on the basis that the *firm* would provide support to the maximum degree possible; and

(e) whether the *firm's own funds* and *own funds requirements* were appropriately adjusted at the time of the *securitisation* on the basis that the *firm* provided support to the maximum degree possible.

(4) If a *firm* fails to comply with article 250(1) of the *UK CRR*, the *FCA* may require it to disclose publicly that it has provided non-contractual support to the transaction.

High-cost credit protection and other significant risk transfer considerations

4.12.28 G Some transactions can transfer little or no economic risk from the protection buyer to the protection seller, but may still result in a reduction in *own funds requirements*. A particular example of a transaction-type of concern involves protection being purchased on a junior tranche and a high premium is paid for that transaction.

4.12.29 G Generally, the amount of premium paid will not materially affect the assessment of whether significant risk transfer has occurred. This is because either:

(1) the protection payment payable upon default from protection seller to protection buyer is significantly larger than the overall premium payable to the protection seller; or

(2) the payment of premium leads to an immediate incurred cost.

4.12.30 G However, there comes a point at which the premium payable for the protection can reduce significantly the actual economic risk that is transferred from the protection buyer to protection seller. A premium payable of 100% of the protection amount could leave the protection buyer in a position over the life of the transaction that was no better than if protection had not been purchased.

4.12.31 G The *FCA* expects *originators* seeking to apply the *securitisation* risk weights to synthetic *securitisations* to take into account all relevant factors to assess the amount of risk transferred. As well as the size and timing of amounts payable to the protection seller, the circumstances in which those amounts are payable can undermine the effectiveness of risk transfer. The *FCA* expects a *firm* seeking capital relief through synthetic securitisations to incorporate premiums in their assessment of significant risk transfer. In particular, the following transaction features may have a significant impact on the amount of risk transfer:

(1) premium which is guaranteed in all or almost all circumstances, for example, premium which is payable upfront or deferred; or

(2) those that could result in the amount of premium payable for protection being significantly greater than the spread income on the assets in the portfolio or similar to the size of the hedged position; or

(3) those under which the protection buyer retains the expected loss through higher transaction costs to the counterparty, in the form of premium or otherwise.

4.12.32 G Article 238 of the *UK CRR* (Maturity of credit protection) requires maturity to be assessed in considering significant risk transfer. When considering the effective maturity of synthetic *securitisations*, the *FCA* expects a *firm* to consider whether the transaction contained an option to terminate the protection at the discretion of the protection buyer.

4.12.33 G The *FCA* considers the following to be examples of features which generally indicate a positive incentive to call or, at least, to constitute grounds for discussion with the *FCA* prior to the conclusion of the transaction:

(1) the transaction contains terms, such as payments at maturity or payments upon early termination or significant premiums, which may reduce risk transfer;

(2) the transaction includes a requirement for the protection buyer to incur additional costs or obligations if they do not exercise their option to terminate the protection; and

(3) there are pre-agreed mechanisms, for example 'at-market unwinds', where the protection seller and protection buyer agree that the transaction can be terminated in the future at a 'market' value and specifies aspects of how the value is calculated.

High-level significant risk transfer considerations

4.12.34 G Significant risk transfer is an ongoing requirement. Accordingly, the *FCA* expects *firms* to ensure that any reduction in *own funds requirements* achieved through *securitisation* continues to be matched by a commensurate transfer of risk throughout the life of the transaction. The *FCA* expects *firms* to take a substance over form approach to assessing significant risk transfer. *Firms* should be able to demonstrate that the capital relief post-transaction adequately captures the economic substance of the entire transaction, and is commensurate to retained risk.

4.12.35 G When risk transfer transactions are structured as a group of linked transactions rather than a single transaction, the *FCA* expects the aggregate effect of linked transactions to comply with the *UK CRR*. The *FCA* expects *firms* to ensure that analysis of risk transfer incorporates all linked transactions, particularly if certain transactions within a group of linked transactions are undertaken at off-market rates.

4.12.36 G The *FCA* expects the instruments used to transfer credit risk not to contain provisions which limit the amount of risk transferred. For example, should losses or defaults on the *securitised exposures* occur(ie, deterioration in the credit quality of the underlying pool) the *FCA* expects the *originator's* net cost of protection or the yield payable to investors should not increase as a result.

4.12.37 G To ensure continued appropriateness, the *FCA* expects *firms* to update the opinions of qualified legal counsel, required by the *UK CRR*, as necessary to ensure their continuing validity. For example, an opinion may need to be updated if relevant statutory provisions are amended, or where a new decision or judgment of a court has a bearing on the continuing validity of counsel's opinion.

4.12.38 G The *FCA* expects relevant *senior management* of a *firm* to be appropriately engaged in the execution of *securitisation* transactions that lead to a reduction in RWEA where the *firm* is providing or purchasing structured trades.

4.12.39 G The *FCA* does not operate a pre-approval process for transactions. The *FCA* expects a *firm* to discuss with its supervisor at any early stage *securitisation* transactions that are material or have complex features. Where a *firm* claims a regulatory capital reduction from *securitisation* transactions in its disclosures to the market, the *FCA* expects such disclosures to include caveats making clear the risk of full or partial re-characterisation where this risk is material in the light of the *FCA's* stated policy.

4.12.40 G Although this section sets out the *FCA's* expectations regarding *securitisations*, these expectations are also relevant for other similar credit protection arrangements.

4.12.41 G The *FCA* will seek to ensure that the *securitisation* framework is not used to undermine or arbitrage other parts of the prudential framework. For other similar credit protection arrangements (eg, those subject *credit risk mitigation* or *trading book* requirements), the impact of certain features (such as significant premiums or call options) may cast doubt on the extent of risk transferred and the resulting capital assessment. Features which result in inadequate *own funds requirements* compared to the risks a *firm* is running may result in the credit protection not being recognised or the *firm* being subject to extra capital charges in their *ICG* in Pillar 2 add-ons. Credit protection arrangements in general are subject to the same overarching principles as those in the *securitisation* framework.

4.12.42 G Where a *firm* achieves significant risk transfer for a particular transaction, the *FCA* expects it to continue to monitor risks related to the transaction to which it may still be exposed. The *firm* should consider capital planning implications of *securitised* assets returning to its balance sheet. The *UK CRR* requires a *firm* to conduct regular stress testing of its *securitisation* activities and off-balance sheet *exposures*. The stress tests should consider the *firm*-wide impact of stressed market conditions on those activities and *exposures* and the implications for other sources of risk (eg, credit risk, concentration risk, counterparty risk, *market risk*, *liquidity risk* and reputational risk). Stress testing of *securitisation* activities should take into account both existing *securitisations* and pipeline transactions. A *firm* should have procedures in place to assess and respond to the results of that stress testing and these should be taken into account under the *overall Pillar 2 rule*.

4.13 Settlement risk

4.13.1 R Where a system wide failure of a settlement system, a clearing system or a *CCP* occurs, the *own funds requirements* calculated in articles 378 (Settlement/delivery risk) and 379 (Free deliveries) of the *UK CRR* are waived until the situation is rectified. In this case, the failure of a counterparty to settle a trade shall not be deemed a default for purposes of credit risk.

[**Note**: article 380 of the *EU CRR*]

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4.14 Counterparty credit risk

Hedging sets

4.14.1 R For the purpose of article 282(6) of the *UK CRR* (Hedging sets), a *firm* must apply the CCR Mark-to-market method as set out in Part Three, Title II, Chapter 6, Section 3 (Mark-to-market method) of the *UK CRR* to:

(1) transactions with non-linear risk profile; or

(2) payment legs and transactions with debt instruments as underlying;

for which it cannot determine the delta or the modified duration, as the case may be, using an internal model approved by the *FCA* under Part Three Title IV of the *UK CRR*

for the purposes of determining *own funds requirements* for market risk.

Recognition of netting: interest rate derivatives

4.14.2 R For the purpose of article 298(4) of the *UK CRR* (Effects of recognition of netting as risk-reducing), a *firm* must use the original maturity of the *interest-rate contract*.

4.14.3 G A *firm* may apply to the *FCA* under section 138A of the *Act* to *waive* IFPRU 4.14.2 R if it wishes to use the residual maturity of the *interest-rate contract*.

Use of internal CVA model for calculation of the maturity factor 'M'

4.14.4 G (1) This *guidance* sets out the *FCA's* expectations for granting permission to a *firm* to use its own one-sided credit valuation adjustment internal models (an "internal CVA model") for the purpose of estimating the maturity factor "M", as proposed under article 162(2)(h) of the *UK CRR* (Maturity).

(2) In the context of counterparty credit risk, the maturity factor "M" is intended to increase the *own funds requirements* to reflect potential higher risks associated with medium and long-term OTC derivative portfolios, more specifically when the exposure profile of these contracts is significant beyond one year. This adjustment is only applicable to a *firm* using the Internal Model Method for the calculation of *exposure* values.

(3) A *firm* is permitted to replace the formula for the maturity factor "M", as set out in article 162(2)(g) of the *UK CRR* with the 'effective

credit duration' derived by a *firm's* internal CVA model, subject to permission being granted by the *FCA*, as the *competent authority*.

(4) Internal CVA models are complex by nature and modelling practises vary significantly across the industry. The *FCA* considers the creation of an acceptable model resulting in an appropriate credit duration to be challenging, and so would require extensive review. Accordingly, the *FCA* expects a *firm* to demonstrate a strong case for the granting of such permission.

(5) A *firm* that wishes to make an application under article 162(2)(h) should provide a satisfactory justification for the use of an internal CVA model for estimating the maturity factor "M". The purpose of reducing the *own funds requirements* for counterparty credit risk will not, on its own, be considered as a reasonable justification. The *FCA* will also expect highly conservative modelling assumptions within a *firm's* internal CVA model for the purpose of article 162(2)(h).

Permission to set the maturity factor 'M' to 1 for the counterparty credit risk default charge

4.14.5 G

(1) This *guidance* sets out the *FCA's* expectations for permitting a *firm* with the permission to use the Internal Model Method set out in Part Three, Title II, Chapter 6, Section 6 (Internal model method) and the permission to use an internal VaR model for specific risk set out in Part Three, Title IV, Chapter 5 (Use of internal models) associated with traded debt instruments to set to 1 the maturity factor "M" defined in article 162 of the *UK CRR*.

(2) In the context of counterparty credit risk, the maturity factor "M" is intended to increase the *own funds requirements* to reflect the potential higher risks associated with medium and long-term *OTC derivative* portfolios, more specifically when the exposure profile of these contracts is significant beyond one year. This adjustment is only applicable to *firms* using the Internal Model Method for the calculation of *exposure* values.

(3) Article 162(2)(i) of the *UK CRR* allows a *firm* to set the maturity factor "M" to 1 for a *firm* using the Internal Model Method provided that the *firm's* internal value-at-risk (VaR) model for specific risk associated with traded debt instruments reflects the effect of rating migration and subject to the permission of the *FCA*, as the *competent authority*.

(4) Internal VaR models for specific risk associated with traded debt instruments are not specifically designed to capture the effects of rating migrations. The risk captured by these models is based on a 10-day time horizon which cannot appropriately reflect the dynamics of rating migrations, which occur on an irregular, infrequent basis. This deficiency was one of the main reasons underlying the introduction of a separate risk measure for the capture of both credit default and rating migration risks, based on a one-year time horizon (the IRC models in article 372 of the *UK CRR* (Internal IRC model)).

(5) Since the challenges of appropriately capturing credit-rating migrations in an internal VaR model are high, the *FCA* expects a *firm* to demonstrate a strong case for the granting of the permission set out in article 162(2)(i) of the *UK CRR*.

(6) A *firm* that wishes to make an application under article 162(2)(i) of the *UK CRR* should provide a satisfactory justification for use of its internal VaR model to capture the risks associated with ratings migration. The purpose of reducing the *own funds requirements* for counterparty credit risk will not be considered as a reasonable justification.

(7) The *FCA* expects highly conservative modelling assumptions for the capture of rating migrations within a *firm's* internal VaR models for specific risk associated with traded debt instruments under article 162(2)(i) of the *UK CRR* (Maturity).

4.15 Credit risk mitigation

Conditions for applying 0% volatility adjustment under the Financial Collateral Comprehensive Method

4.15.1 G For purposes of repurchase transactions and securities lending or borrowing transactions, the *FCA* does not consider that there are any core market participants apart from those entities listed in article 227(3) of the *UK CRR*.

4 Annex 1G Slotting criteria

Table 1 - Supervisory rating grades for project finance exposures				
	Strong	Good	Satisfactory	Weak
Financial strength				
Market conditions	Few competing suppliers or substantial and durable advantage in location, cost, or technology. Demand is strong and growing	Few competing suppliers or better than average location, cost, or technology but this situation may not last. Demand is strong and stable	Project has no advantage in location, cost, or technology. Demand is adequate and stable	Project has worse than average location, cost, or technology. Demand is weak and declining
Financial ratios (eg, debt service coverage ratio (DSCR), loan life coverage ratio (LLCR), project life coverage ratio (PLCR), and debt-to-equity ratio)	Strong financial ratios considering the level of project risk; very robust economic assumptions	Strong to acceptable financial ratios considering the level of project risk; robust project economic assumptions	Standard financial ratios considering the level of project risk	Aggressive financial ratios considering the level of project risk
Stress analysis	The project can meet its financial obligations under sustained, severely stressed economic or sectoral conditions	The project can meet its financial obligations under normal stressed economic or sectoral conditions. The project is only likely to default under severe economic conditions	The project is vulnerable to stresses that are not uncommon through an economic cycle, and may default in a normal downturn	The project is likely to default unless conditions improve soon
Financial structure				
Duration of the credit compared to the duration of the project	Useful life of the project significantly exceeds tenor of the loan	Useful life of the project exceeds tenor of the loan	Useful life of the project exceeds tenor of the loan	Useful life of the project may not exceed tenor of the loan
Amortisation schedule	Amortising debt	Amortising debt	Amortising debt repayments with limited bullet payment	Bullet repayment or amortising debt repayments with high bullet repayment
Political and legal environment				
Political risk, including transfer risk, considering project type and mitigants	Very low exposure; strong mitigation instruments, if needed	Low exposure; satisfactory mitigation instruments, if needed	Moderate exposure; fair mitigation instruments	High exposure; no or weak mitigation instruments

Table 1 - Supervisory rating grades for project finance exposures				
	Strong	Good	Satisfactory	Weak
Force majeure risk (war, civil unrest, etc)	Low exposure	Acceptable exposure	Standard protection	Significant risks, not fully mitigated
Government support and project's importance for the country over the long term	Project of strategic importance for the country (preferably export-oriented). Strong support from Government	Project considered important for the country. Good level of support from Government	Project may not be strategic but brings unquestionable benefits for the country. Support from Government may not be explicit	Project not key to the country. No or weak support from Government
Stability of legal and regulatory environment (risk of change in law	Favourable and stable regulatory environment over the long term	Favourable and stable regulatory environment over the medium term	Regulatory changes can be predicted with a fair level of certainty	Current or future regulatory issues may affect the project
Acquisition of all necessary supports and approvals for such relief from local content laws	Strong	Satisfactory	Fair	Weak
Enforceability of contracts, collateral and security	Contracts, collateral and security are enforceable	Contracts, collateral and security are enforceable	Contracts, collateral and security are considered enforceable even if certain non-key issues may exist	There are unresolved key issues for actual enforcement of contracts, collateral and security
Transaction characteristics				
Design and technology risk	Fully proven technology and design	Fully proven technology and design	Proven technology and design and start-up issues are mitigated by a strong completion package	Unproven technology and design; technology issues exist and/or complex design
Construction risk				
Permitting and siting	All permits have been obtained	Some permits are still outstanding but their receipt is considered very likely	Some permits are still outstanding but the permitting process is well defined and they are considered routine	Key permits still need to be obtained and are not considered routine. Significant conditions may be attached
Type of construction contract	Fixed-price date-certain turnkey construction EPC (engineering and procurement contract)	Fixed-price date-certain turnkey construction EPC	Fixed-price date-certain turnkey construction contract with one or several contractors	No or partial fixed-price turnkey contract and/or interfacing issues with multiple contractors
Completion guarantees	Substantial liquidated damages, supported by financial substance and/or strong completion guarantee from sponsors	Significant liquidated damages, supported by financial substance and/or completion guarantee from sponsors with	Adequate liquidated damages, supported by financial substance and/or completion guarantee from sponsors with	Inadequate liquidated damages or not supported by financial substance or weak completion guarantees

Table 1 - Supervisory rating grades for project finance exposures				
	Strong	Good	Satisfactory	Weak
	with excellent financial standing	good financial standing	good financial standing	
Track record and financial strength of contractor in constructing similar projects	Strong	Good	Satisfactory	Weak
Operating risk				
Scope and nature of operations and maintenance (O & M) contracts	Strong long-term O&M contract, preferably with contractual performance incentives, and/or O&M reserve accounts	Long-term O&M contract, and/or O&M reserve accounts	Limited O&M contract or O&M reserve account	No O&M contract risk of high operational cost overruns beyond mitigants
Operator's expertise, track record, and financial strength	Very strong, or committed technical assistance of the sponsors	Strong	Acceptable	Limited/weak, or local operator dependent on local authorities
Off-take risk				
(a) If there is a take-or-pay or fixed-price off-take contract:	Excellent creditworthiness of off-taker; strong termination clauses; tenor of contract comfortably exceeds the maturity of the debt	Good creditworthiness of off-taker; strong termination clauses; tenor of contract exceeds the maturity of the debt	Acceptable financial standing of off-taker; normal termination clauses; tenor of contract generally matches the maturity of the debt	Weak off-taker; weak termination clauses; tenor of contract does not exceed the maturity of the debt
(b) If there is no take-or-pay or fixed-price off-take contract:	Project produces essential services or a commodity sold widely on a world market; output can readily be absorbed at projected prices, even at lower than historic market growth rates	Project produces essential services or a commodity sold widely on a regional market that will absorb it at projected prices at historical growth rates	Commodity is sold on a limited market that may absorb it only at lower than projected prices	Project output is demanded by only one or a few buyers or is not generally sold on an organised market
Supply risk				
Price, volume and transportation risk of feed-stocks; supplier's track record and financial strength	Long-term supply contract with supplier of excellent financial standing	Long-term supply contract with supplier of good financial standing	Long-term supply contract with supplier of good financial standing - a degree of price risk may remain	Short-term supply contract or long-term supply contract with financially weak supplier - a degree of price risk definitely remains
Reserve risks (eg, natural resource development)	Independently audited, proven and developed reserves well in excess of requirements over lifetime of the project	Independently audited, proven and developed reserves in excess of requirements over the lifetime of the project	Proven reserves can supply the project adequately through the maturity of the debt	Project relies to some extent on potential and undeveloped reserves

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Table 1 - Supervisory rating grades for project finance exposures				
	Strong	Good	Satisfactory	Weak
Strength of sponsor				
Sponsor's track record, financial strength, and country/sector experience	Strong sponsor with excellent track record and high financial standing	Good sponsor with satisfactory track record and good financial standing	Adequate sponsor with adequate track record and good financial standing	Weak sponsor with no or questionable track record and/or financial weaknesses
Sponsor support, as evidenced by equity, ownership clause and incentive to inject additional cash if necessary	Strong. Project is highly strategic for the sponsor (core business - long-term strategy)	Good. Project is strategic for the sponsor (core business - long-term strategy)	Acceptable. Project is considered important for the sponsor (core business)	Limited. Project is not key to sponsor's long-term strategy or core business
Security package				
Assignment of contracts and accounts	Fully comprehensive	Comprehensive	Acceptable	Weak
Pledge of assets, taking into account quality, value and liquidity of assets	First perfected security interest in all project assets, contracts, permits and accounts necessary to run the project	Perfected security interest in all project assets, contracts, permits and accounts necessary to run the project	Acceptable security interest in all project assets, contracts, permits and accounts necessary to run the project	Little security or collateral for lenders; weak negative pledge clause
Lender's control over cash flow (eg, cash sweeps, independent escrow accounts)	Strong	Satisfactory	Fair	Weak
Strength of the covenant package (mandatory prepayments, payment deferrals, payment cascade, dividend restrictions, etc)	Covenant package is strong for this type of project Project may issue no additional debt	Covenant package is satisfactory for this type of project Project may issue extremely limited additional debt	Covenant package is fair for this type of project Project may issue limited additional debt	Covenant package is insufficient for this type of project Project may issue unlimited additional debt
Reserve funds (debt service, O&M, renewal and replacement, unforeseen events, etc)	Longer than average coverage period, all reserve funds fully funded in cash or letters of credit from highly rated bank	Average coverage period, all reserve funds fully funded	Average coverage period, all reserve funds fully funded	Shorter than average coverage period, reserve funds funded from operating cash flows

Table 2 - Supervisory rating grades for income-producing real estate exposures				
	Strong	Good	Satisfactory	Weak
Financial strength				
Market conditions	The supply and demand for the project's type and location are currently in equilibrium. The number	The supply and demand for the project's type and location are currently in equilibrium. The number	Market conditions are roughly in equilibrium. Competitive properties are coming on the market and	Market conditions are weak. It is uncertain when conditions will improve and return to equilibrium.

Table 2 - Supervisory rating grades for income-producing real estate exposures				
	Strong	Good	Satisfactory	Weak
	of competitive properties coming to market is equal or lower than forecasted demand	of competitive properties coming to market is roughly equal to forecasted demand	others are in the planning stages. The project's design and capabilities may not be state of the art compared to new projects	The project is losing tenants at lease expiration. New lease terms are less favourable compared to those expiring
Financial ratios and advance rate	The property's debt service coverage ratio (DSCR) is considered strong (DSCR is not relevant for the construction phase) and its loan-to-value ratio (LTV) is considered low given its property type. Where a secondary market exists, the transaction is underwritten to market standards	The DSCR (not relevant for development real estate) and LTV are satisfactory. Where a secondary market exists, the transaction is underwritten to market standards	The property's DSCR has deteriorated and its value has fallen, increasing its LTV	The property's DSCR has deteriorated significantly and its LTV is well above underwriting standards for new loans
Stress analysis	The property's resources, contingencies and liability structure allow it to meet its financial obligations during a period of severe financial stress (eg, interest rates, economic growth)	The property can meet its financial obligations under a sustained period of financial stress (eg, interest rates, economic growth). The property is likely to default only under severe economic conditions	During an economic downturn, the property would suffer a decline in revenue that would limit its ability to fund capital expenditures and significantly increase the risk of default	The property's financial condition is strained and is likely to default unless conditions improve in the near term
Cash-flow predictability				
(a) For complete and stabilised property	The property's leases are long-term with creditworthy tenants and their maturity dates are scattered. The property has a track record of tenant retention upon lease expiration. Its vacancy rate is low. Expenses (maintenance, insurance, security and property taxes) are predictable	Most of the property's leases are long term, with tenants that range in creditworthiness. The property experiences a normal level of tenant turnover upon lease expiration. Its vacancy rate is low. Expenses are predictable	Most of the property's leases are medium rather than long term, with tenants that range in creditworthiness. The property experiences a moderate level of tenant turnover upon lease expiration. Its vacancy rate is moderate. Expenses are relatively predictable but vary in relation to revenue	The property's leases are of various terms with tenants that range in creditworthiness. The property experiences a very high level of tenant turnover upon lease expiration. Its vacancy rate is high. Significant expenses are incurred preparing space for new tenants
(b) For complete	Leasing activity	Leasing activity	Most leasing activ-	Market rents do

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Table 2 - Supervisory rating grades for income-producing real estate exposures				
	Strong	Good	Satisfactory	Weak
but not stabilised property	meets or exceeds projections. The project should achieve stabilisation in the near future	meets or exceeds projections. The project should achieve stabilisation in the near future	ity is within projections; however, stabilisation will not occur for some time	not meet expectations. Despite achieving target occupancy rate, cash flow coverage is tight due to disappointing revenue
(c) For construction phase	The property is entirely pre-leased through the tenor of the loan or pre-sold to an investment grade tenant or buyer, or the bank has a binding commitment for take-out financing from an investment grade lender	The property is entirely pre-leased or pre-sold to a creditworthy tenant or buyer, or the bank has a binding commitment for permanent financing from a creditworthy lender	Leasing activity is within projections but the building may not be pre-leased and there may not exist a take-out financing. The bank may be the permanent lender	The property is deteriorating due to cost overruns, market deterioration, tenant cancellations or other factors. There may be a dispute with the party providing the permanent financing
Asset characteristics				
Location	Property is located in highly desirable location that is convenient to services that tenants desire	Property is located in desirable location that is convenient to services that tenants desire	The property location lacks a competitive advantage	The property's location, configuration, design and maintenance have contributed to the property's difficulties
Design and condition	Property is favoured due to its design, configuration, and maintenance, and is highly competitive with new properties	Property is appropriate in terms of its design, configuration and maintenance. The property's design and capabilities are competitive with new properties	Property is adequate in terms of its configuration, design and maintenance	Weaknesses exist in the property's configuration, design or maintenance
Property is under construction	Construction budget is conservative and technical hazards are limited. Contractors are highly qualified	Construction budget is conservative and technical hazards are limited. Contractors are highly qualified	Construction budget is adequate and contractors are ordinarily qualified	Project is over budget or unrealistic given its technical hazards. Contractors may be under qualified
Strength of sponsor/ developer				
Financial capacity and willingness to support the property	The sponsor/ developer made a substantial cash contribution to the construction or purchase of the property. The sponsor/ developer has substantial resources and limited direct and	The sponsor/ developer made a material cash contribution to the construction or purchase of the property. The sponsor/ developer's financial condition allows it to support the	The sponsor/ developer's contribution may be immaterial or non-cash. The sponsor/ developer is average to below-average in financial resources	The sponsor/ developer lacks capacity or willingness to support the property

Table 2 - Supervisory rating grades for income-producing real estate exposures				
	Strong	Good	Satisfactory	Weak
	contingent liabilities. The sponsor/ developer's properties are diversified geographically and by property type	property in the event of a cash flow shortfall. The sponsor/ developer's properties are located in several geographic region		
Reputation and track record with similar properties	Experienced management and high sponsor quality. Strong reputation and lengthy and successful record with similar properties	Appropriate management and sponsor quality. The sponsor or management has a successful record with similar properties	Moderate management and sponsor quality. Management or sponsor track record does not raise serious concerns	Ineffective management and substandard sponsor quality. Management and sponsor difficulties have contributed to difficulties in managing properties in the past
Relationships with relevant real estate actors	Strong relationships with leading actors, such as leasing agents	Proven relationships with leading actors, such as leasing agents	Adequate relationships with leasing agents and other parties providing important real estate services	Poor relationships with leasing agents and/or other parties providing important real estate services
Security package				
Nature of lien	Perfected first lien (Note 1)	Perfected first lien (Note 1)	Perfected first lien (Note 1)	Ability of lender to foreclose is constrained
Assignment of rents (for projects leased to long-term tenants)	The lender has obtained an assignment. They maintain current tenant information that would facilitate providing notice to remit rents directly to the lender, such as a current rent roll and copies of the project's leases	The lender has obtained an assignment. They maintain current tenant information that would facilitate providing notice to the tenants to remit rents directly to the lender, such as current rent roll and copies of the project's leases	The lender has obtained an assignment. They maintain current tenant information that would facilitate providing notice to the tenants to remit rents directly to the lender, such as current rent roll and copies of the project's leases	The lender has not obtained an assignment of the leases or has not maintained the information necessary to readily provide notice to the building's tenants
Quality of the insurance coverage	Appropriate	Appropriate	Appropriate	Substandard

Note 1: Lenders in some markets extensively use loan structures that include junior liens. Junior liens may be indicative of this level of risk if the total LTV inclusive of all senior positions does not exceed a typical first loan LTV.

Table 3 - Supervisory rating grades for object finance exposures				
	Strong	Good	Satisfactory	Weak
Financial strength				
Market conditions	Demand is strong and growing, strong entry barriers, low sensitiv-	Demand is strong and stable. Some entry barriers, some sensitivity to	Demand is adequate and stable, limited entry barriers, significant	Demand is weak and declining, vulnerable to changes in techno-

Table 3 - Supervisory rating grades for object finance exposures

	Strong	Good	Satisfactory	Weak
	ity to changes in technology and economic outlook	changes in technology and economic outlook	sensitivity to changes in technology and economic outlook	logy and economic outlook, highly uncertain environment
Financial ratios (debt service coverage ratio and loan-to-value ratio)	Strong financial ratios considering the type of asset. Very robust economic assumptions	Strong / acceptable financial ratios considering the type of asset. Robust project economic assumptions	Standard financial ratios for the asset type	Aggressive financial ratios considering the type of asset
Stress analysis	Stable long-term revenues, capable of withstanding severely stressed conditions through an economic cycle	Satisfactory short-term revenues. Loan can withstand some financial adversity. Default is only likely under severe economic conditions	Uncertain short-term revenues. Cash flows are vulnerable to stresses that are not uncommon through an economic cycle. The loan may default in a normal downturn	Revenues subject to strong uncertainties; even in normal economic conditions the asset may default, unless conditions improve
Market liquidity	Market is structured on a worldwide basis; assets are highly liquid	Market is worldwide or regional; assets are relatively liquid	Market is regional with limited prospects in the short term, implying lower liquidity	Local market and/or poor visibility. Low or no liquidity, particularly on niche markets
Political and legal environment				
Political risk, including transfer risk	Very low; strong mitigation instruments, if needed	Low; satisfactory mitigation instruments, if needed	Moderate; fair mitigation instruments	High; no or weak mitigation instruments
Legal and regulatory risks	Jurisdiction is favourable to repossession and enforcement of contracts	Jurisdiction is favourable to repossession and enforcement of contracts	Jurisdiction is generally favourable to repossession and enforcement of contracts, even if repossession might be long and/or difficult	Poor or unstable legal and regulatory environment. Jurisdiction may make repossession and enforcement of contracts lengthy or impossible
Transaction characteristics				
Financing term compared to the economic life of the asset	Full pay-out profile/minimum balloon. No grace period	Balloon more significant, but still at satisfactory levels	Important balloon with potentially grace periods	Repayment in fine or high balloon
Operating risk				
Permits / licensing	All permits have been obtained; asset meets current and foreseeable safety regulations	All permits obtained or in the process of being obtained; asset meets current and foreseeable safety regulations	Most permits obtained or in process of being obtained, outstanding ones considered routine, asset meets current safety regulations	Problems in obtaining all required permits, part of the planned configuration and/or planned operations might need to be revised

Table 3 - Supervisory rating grades for object finance exposures				
	Strong	Good	Satisfactory	Weak
Scope and nature of O & M contracts	Strong long-term O & M contract, preferably with contractual performance incentives, and/or O & M reserve accounts (if needed)	Long-term O & M contract, and/or O & M reserve accounts (if needed)	Limited O & M contract or O & M reserve account (if needed)	No O & M contract: risk of high operational cost overruns beyond mitigants
Operator's financial strength, track record in managing the asset type and capability to re-market asset when it comes off-lease	Excellent track record and strong re-marketing capability	Satisfactory track record and re-marketing capability	Weak or short track record and uncertain re-marketing capability	No or unknown track record and inability to re-market the asset
Asset characteristics				
Configuration, size, design and maintenance (ie, age, size for a plane) compared to other assets on the same market	Strong advantage in design and maintenance. Configuration is standard such that the object meets a liquid market	Above average design and maintenance. Standard configuration, maybe with very limited exceptions - such that the object meets a liquid market	Average design and maintenance. Configuration is somewhat specific, and thus might cause a narrower market for the object	Below average design and maintenance. Asset is near the end of its economic life. Configuration is very specific; the market for the object is very narrow
Resale value	Current resale value is well above debt value	Resale value is moderately above debt value	Resale value is slightly above debt value	Resale value is below debt value
Sensitivity of the asset value and liquidity to economic cycles	Asset value and liquidity are relatively insensitive to economic cycles	Asset value and liquidity are sensitive to economic cycles	Asset value and liquidity are quite sensitive to economic cycles	Asset value and liquidity are highly sensitive to economic cycles
Strength of sponsor				
Operator's financial strength, track record in managing the asset type and capability to re-market asset when it comes off-lease	Excellent track record and strong re-marketing capability	Satisfactory track record and re-marketing capability	Weak or short track record and uncertain re-marketing capability	No or unknown track record and inability to re-market the asset
Sponsors' track record and financial strength	Sponsors with excellent track record and high financial standing	Sponsors with good track record and good financial standing	Sponsors with adequate track record and good financial standing	Sponsors with no or questionable track record and/or financial weaknesses
Security package				
Asset control	Legal documentation provides the lender effective control (eg, a first perfected security	Legal documentation provides the lender effective control (eg, a perfected security in-	Legal documentation provides the lender effective control (eg, a perfected security in-	The contract provides little security to the lender and leaves room to some risk of losing

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Table 3 - Supervisory rating grades for object finance exposures				
	Strong	Good	Satisfactory	Weak
	interest, or a leasing structure including such security) on the asset, or on the company owning it	terest, or a leasing structure including such security) on the asset, or on the company owning it	terest, or a leasing structure including such security) on the asset, or on the company owning it	control on the asset
Rights and means at the lender's disposal to monitor the location and condition of the asset	The lender is able to monitor the location and condition of the asset, at any time and place (regular reports, possibility to lead inspections)	The lender is able to monitor the location and condition of the asset, almost at any time and place	The lender is able to monitor the location and condition of the asset, almost at any time and place	The lender is able to monitor the location and condition of the asset are limited
Insurance against damages	Strong insurance coverage including collateral damages with top quality insurance companies	Satisfactory insurance coverage (not including collateral damages) with good quality insurance companies	Fair insurance coverage (not including collateral damages) with acceptable quality insurance companies	Weak insurance coverage (not including collateral damages) or with weak quality insurance companies

Table 4 - Supervisory rating grades for commodities finance exposures				
	Strong	Good	Satisfactory	Weak
Financial strength				
Degree of over-collateralisation of trade	Strong	Good	Satisfactory	Weak
Political and legal environment				
Country risk	No country risk	Limited exposure to country risk (in particular, offshore location of reserves in an emerging country)	Exposure to country risk (in particular, offshore location of reserves in an emerging country)	Strong exposure to country risk (in particular, inland reserves in an emerging country)
Mitigation of country risks	Very strong mitigation: Strong offshore mechanisms Strategic commodity 1st class buyer	Strong mitigation: Offshore mechanisms Strategic commodity Strong buyer	Acceptable mitigation: Offshore mechanisms Less strategic commodity Acceptable buyer	Only partial mitigation: No offshore mechanisms Non-strategic commodity Weak buyer
Asset characteristics				
Liquidity and susceptibility to damage	Commodity is quoted and can be hedged through futures or OTC instruments. Commod	Commodity is quoted and can be hedged through OTC instruments. Commodity is not sus-	Commodity is not quoted but is liquid. There is uncertainty about the possibility of hedging. Com-	Commodity is not quoted. Liquidity is limited given the size and depth of the market. No appropri-

Table 4 - Supervisory rating grades for commodities finance exposures				
	Strong	Good	Satisfactory	Weak
	ity is not susceptible to damage	ceptible to damage	modity is not susceptible to damage	ate hedging instruments. Commodity is susceptible to damage
Strength of sponsor				
Financial strength of trader	Very strong, relative to trading philosophy and risks	Strong	Adequate	Weak
Track record, including ability to manage the logistic process	Extensive experience with the type of transaction in question. Strong record of operating success and cost efficiency	Sufficient experience with the type of transaction in question. Above average record of operating success and cost efficiency	Limited experience with the type of transaction in question. Average record of operating success and cost efficiency	Limited or uncertain track record in general. Volatile costs and profits
Trading controls and hedging policies	Strong standards for counterparty selection, hedging, and monitoring	Adequate standards for counterparty selection, hedging, and monitoring	Past deals have experienced no or minor problems	Trader has experienced significant losses on past deals
Quality of financial disclosure	Excellent	Good	Satisfactory	Financial disclosure contains some uncertainties or is insufficient
Security package				
Asset control	First perfected security interest provides the lender legal control of the assets at any time if needed	First perfected security interest provides the lender legal control of the assets at any time if needed	At some point in the process, there is a rupture in the control of the assets by the lender. The rupture is mitigated by knowledge of the trade process or a third party undertaking as the case may be	Contract leaves room for some risk of losing control over the assets. Recovery could be jeopardised
Insurance against damages	Strong insurance coverage including collateral damages with top quality insurance companies	Satisfactory insurance coverage (not including collateral damages) with good quality insurance companies	Fair insurance coverage (not including collateral damages) with acceptable quality insurance companies	Weak insurance coverage (not including collateral damages) or with weak quality insurance companies

4 Annex 2G Wholesale LGD and EAD framework

1. The following framework should be used to assess wholesale LGD models in the circumstances set out in IFPRU 4.7.15 G:

   (a) For unsecured recoveries if a *firm* has fewer than 20 relevant default observations of recoveries in a specific country for an individual type of *exposure*, then the maximum recovery a *firm* can assume should be equivalent to that which would give a 45% LGD for senior unsecured *exposures*, 75% for subordinated *exposures* and 11.25% for covered bonds.

   (b) If a *firm* is taking account of non-financial collateral which is not eligible under the foundation approach where it does not have 20 or more relevant data points of recovery values for that type of collateral or does not have a reliable time series of market price data for the collateral in a specific country, then the LGD for the *exposure* to which the collateral is applied should be floored at 45%.

   (c) If a *firm* is taking account of non-financial collateral which is eligible under the foundation approach, where it does not have 20 or more relevant data points of recovery values for that type of collateral or does not have a reliable time series of market price data for that collateral in a specific country, then the LGD for the *exposure* to which the collateral is applied should be floored at 35%.

2. *Firms* should note the following when applying the framework to LGD models:

   (a) The 20 or more relevant data points can include internal or external data. However, the *FCA* expects *firms* to ensure that each data point is independent, representative and an accurate record of the recovery for that exposure or collateral type in that specific country.

   (b) The *FCA* anticipates that *firms* are able to use market price data within the framework where they have less than 20 defaults only in exceptional circumstances. As a minimum, *firms* need to demonstrate that the market price data being used is representative of their collateral and that it is over a long enough time period to ensure that an appropriate downturn and forced sale haircut can be estimated.

   (c) The framework does not affect the use of financial collateral.

   (d) The framework does not affect the use of unfunded credit protection.

   (e) Where a model takes account of multiple collateral types, if this only includes collateral that is eligible under the foundation approach then LGDs should be floored at 35%, and if any collateral type is not eligible under the foundation approach then LGDs should be floored at 45%.

   (f) The effect of this framework is to floor bank and non-bank financial institution (NBFI) *exposures* at foundation values unless sufficient country-specific recovery data is available. This floor should be applied where the *exposures* are to types of banks and NBFIs that are not sufficiently represented in the available historic data (eg, if the historic recovery data only relates to small banks then the floor will affect large banks).

   (g) When applying the framework, the *FCA* expects *firms* to assess whether the 11.25% LGD floor for covered bonds is sufficient given the quality of the underlying assets

3. *Firms* should select the most appropriate of the following three options when using the framework to assess wholesale EAD models in the circumstances set out in IFPRU 4.8.9 G:

   (a) rank-order the off balance sheet product types (separately for lending and trade finance) according to their drawdown risk. The EAD parameter for a product with 20 or more default observations can then be applied to low-default products with a lower drawdown risk; or

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(b) for product types where the *firm* has the defaults needed to estimate the EAD for committed credit lines (or an estimate derived from the option above) but less than 20 defaults for uncommitted credit lines, use 50% of the committed credit line conversion factor as an estimate of the uncommitted credit line conversion factor; or

(c) apply the foundation parameters.

4. *Firms* should note the following when applying the framework to EAD models:

(a) *Firms* may select more than one option when applying the framework, providing that they can demonstrate that their chosen combination is appropriate, reflecting their particular mix of products and risks, and is not selected to minimise their *own funds requirements*.

(b) As the *FCA* believes that the EAD experienced by *firms* is dependent on their own credit management processes it would expect only internal data to be used to estimate EAD. However, where *firms* can convincingly demonstrate to the *FCA's* satisfaction that the credit process are consistent across countries then the *FCA* would accept that data sourced from these countries could be combined to estimate the EAD for each product (ie, the 20 default data points do not have to be country specific for the purposes of estimating EAD).

(c) *Firms* using the option in (a), above, should be able to demonstrate that a sufficiently robust approach has been taken to rank-ordering their product types by drawdown risk. This approach must be fully documented and assessed by an independent reviewer.