EUROPEAN CENTRAL BANK

BANKING SUPERVISION

Costs and benefits analysis

Policy options for the definition of the materiality threshold for credit obligations past due

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1 Background and rationale

1.1 Introduction

The European Central Bank (ECB) is the competent authority (CA) for the supervision of significant credit institutions (SIs) in the Member States participating in the Single Supervisory Mechanism (SSM).

Under Article 178(2)(d) of the Capital Requirements Regulation (CRR)[1], competent authorities are required to define a threshold against which the materiality of a credit obligation past due will be assessed for the purpose of identifying a default of an obligor in relation to the obligor's total obligations or at the level of an individual credit facility.

In accordance with Article 178(6) CRR, the European Banking Authority (EBA) developed draft regulatory technical standards to specify how competent authorities should set the materiality threshold for credit obligations past due. The final regulatory technical standards (RTS) adopted by the EU Commission are contained in the Commission Delegated Regulation (EU) No 2018/171[2].

For SIs, the ECB needs to define the materiality threshold of a credit obligation past due in line with the RTS and to issue an ECB regulation[3]. In accordance with Article 4(3) of the SSM Regulation[4], before adopting a regulation the ECB conducts open public consultations and analyses the potential related costs and benefits, unless such consultations and analyses are disproportionate in relation to the scope and impact of the regulations concerned or in relation to the particular urgency of the matter, in which case the ECB justifies that urgency. In the specific context of the materiality threshold, both the scope and the impact of the definition of the threshold are deemed to justify the consultation and the cost and benefit analysis. In fact, the definition is to be applied by all SIs and will affect not only core functional processes such as the identification of defaults and thus risk quantification, but also operative processes such as the management of clients with overdue exposures.

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[1] Regulation (EU) No 575/2013 of the European Parliament and of the Council of 26 June 2013 on prudential requirements for credit institutions and investment firms and amending Regulation (EU) No 648/2012 (OJ L 176, 27.6.2013, p. 1).

[2] Commission Delegated Regulation (EU) 2018/171 of 19 October 2017 on supplementing Regulation (EU) No 575/2013 of the European Parliament and of the Council with regard to regulatory technical standards for the materiality threshold for credit obligations past due (OJ L 32, 6.2.2018, p. 1).

[3] The ECB's policy regarding the definition of the level of the materiality threshold was not included in Regulation (EU) 2016/445 of the European Central Bank of 14 March 2016 on the exercise of options and discretions available in Union law (ECB/2016/4), (OJ L 78, 24.3.2016, p. 60), given that it was considered appropriate to wait until the European Commission had adopted the RTS before defining such a threshold in order that the framework and conditions in the RTS could be duly taken into account. For this reason, it was included among the options and discretions (OND) provisions for which further action or assessment was required (namely, Section III of the ECB Guide on options and discretions available in Union law).

[4] Council Regulation (EU) No 1024/2013 of 15 October 2013 conferring specific tasks on the European Central Bank concerning policies relating to the prudential supervision of credit institutions (OJ L 287, 29.10.2013, p. 63).

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Against this background, this document serves to substantiate the analysis of costs and benefits related to the different policy options for the ECB's definition of the materiality threshold for credit obligations past due.

The remainder of this chapter clarifies the regulatory regime for the features of the materiality threshold and the conditions for its definition.

Chapter 2 presents an overview of the practices across national competent authorities (NCAs) of the Member States participating in the SSM regarding their method of defining the materiality thresholds and the levels that have been applied so far.

Chapter 3 presents the different policy options that the ECB sees as potentially suitable for defining the materiality threshold in accordance with the RTS.

Chapter 4 presents a framework for analysing the costs and benefits, consisting of qualitative categories for comparing policy options and additional quantitative elements. This framework is then used to assess the costs and benefits of the different policy options.

Finally, the last chapter draws conclusions and identifies the most appropriate policy option for the level of the materiality threshold to be defined by the ECB.

1.2 Regulatory regime

Under Article 178(1) CRR and in light of Article 4 of the ECB Regulation (EU) 2016/445 on the exercise of options and discretions available in Union law, a default should be considered to have occurred with regard to a particular obligor[5] when either or both of the following have taken place:

1. the institution considers that the obligor is unlikely to pay its credit obligations to the institution, the parent undertaking or any of its subsidiaries in full, without recourse by the institution to actions such as realising security;

2. the obligor is past due more than 90 days on any material credit obligation to the institution, the parent undertaking or any of its subsidiaries.

Under Article 178(2)(d) CRR, the materiality of a credit obligation past due should be assessed against a threshold defined by the competent authorities. To this end, the RTS specify the conditions that competent authorities should respect when setting the level of the threshold.

The RTS provide that the materiality threshold should consist of an absolute and a relative component to be expressed as follows:

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[5]   To be intended as "an individual credit facility" here and in the remainder of this document if the institution applies Article 178 CRR at the level of individual credit facilities for retail exposures.

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- the absolute component should be expressed as a maximum amount for the sum of all amounts past due owed by an obligor to the institution, the parent undertaking of that institution or any of its subsidiaries (credit obligation past due);

- the relative component should be expressed as a percentage reflecting the amount of the credit obligation past due in relation to the total amount of all on-balance sheet exposures of the institution to that obligor, the parent undertaking of that institution or any of its subsidiaries, excluding equity exposures.

An obligor is in default when both the limit expressed as the absolute component of the materiality threshold and the limit expressed as the relative component of that threshold are exceeded for 90 consecutive days.

The RTS state that the competent authorities should set for all credit institutions in their respective jurisdiction a single materiality threshold for retail exposures and a single materiality threshold for non-retail exposures. Under paragraph 2 of Article 1(1) of the RTS, the competent authorities may set a separate single materiality threshold for retail exposures for institutions applying the definition of default at the level of an individual credit facility.

When setting the threshold, the competent authorities should respect all the following conditions:

- the absolute component for retail exposures should not exceed €100;

- the absolute component for non-retail exposures should not exceed €500;

- the relative component for retail exposures and the relative component for exposures other than retail exposures should be:

  - between 0% and 2.5%;

  - set at 1% whenever that percentage reflects a level of risk that the competent authority considers to be reasonable in accordance with Article 3 of the RTS.

- the specific risk characteristics for retail exposures and exposures other than retail exposures should be considered separately.

In accordance with Article 3 of the RTS, the competent authorities should consider that a materiality threshold reflects a reasonable level of risk where both of the following conditions are met:
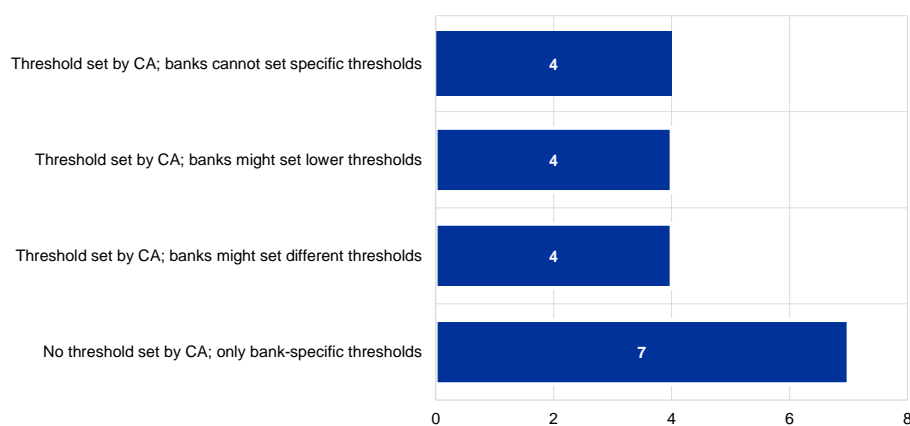
  - the materiality threshold does not lead to the recognition of an excessive number of defaults that are due to other circumstances than financial difficulties of an obligor;

  - the materiality threshold does not lead to significant delays in the recognition of defaults that are due to financial difficulties of an obligor.

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2 Current practices across euro area NCAs

This chapter provides an overview of the materiality thresholds currently applied by competent authorities at country level and highlights deviations from the RTS, in terms of both level and structure, based on a survey of practices across the SSM.

The survey highlights a wide range of practices, as illustrated by **Chart 1**.

Chart 1

Supervisory versus institution-specific thresholds

	Value
Threshold set by CA; banks cannot set specific thresholds	4
Threshold set by CA; banks might set lower thresholds	4
Threshold set by CA; banks might set different thresholds	4
No threshold set by CA; only bank-specific thresholds	7

Source: ECB.

Table 1 provides a detailed overview of the different practices currently in place in different jurisdictions within the SSM.

As shown in Table 1, absolute thresholds are set in 11 countries, with levels ranging from €0 to €500 for retail exposures and from €0 to €1,000 for non-retail exposures. Out of these 11 countries, only four differentiate the absolute thresholds between retail and non-retail exposures, whereas only Greece and Cyprus have different relative thresholds for retail and non-retail exposures.

For all jurisdictions, evidence shows that, where relative thresholds are set, both the relative and absolute components must be exceeded in order to exceed the materiality threshold.

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Table 1

Levels of absolute and relative thresholds across countries

	Absolute threshold		Relative threshold	
	Retail	**Non-retail**	**Retail**	**Non-retail**
Austria	€250 or bank-specific (lower)		2.5%	
Belgium	bank-specific		0%	
Cyprus	€500	€1,000	0%	10%
Estonia	Only bank-specific			
Finland	€100 or bank-specific (lower)	€1,000 or bank-specific (lower)	0%	
France	€1 or bank-specific		0% or bank-specific	
Germany	€100		2.5%	
Greece	€50 (Mortgages: €100) or bank-specific	€500 or bank-specific	2% of credit limit or 5% of regular instalment or bank-specific	
Ireland	Only bank-specific			
Italy	€0	€0	5%	
Latvia	Only bank-specific			
Lithuania	Only bank-specific			
Luxembourg	Only bank-specific			
Malta	€0		0%	
Netherlands	Only bank-specific			
Portugal	€50 or bank-specific		0%	
Slovakia	€50 or bank-specific (lower)	€250 or bank-specific (lower)	0%	
Slovenia	€200 or bank-specific (lower)		2%[6]	
Spain	Only bank-specific			

Source: ECB.

The levels set in euro area countries for the relative threshold range from 2% to 10%. Besides the differences in levels, there are also several dissimilarities in the structures of the relative thresholds, both compared to the structure set in the RTS and across countries.

More precisely, the structure of the relative component of the materiality threshold as set in the RTS is summarised in the following formula:

$$\frac{Credit\ obligation\ past\ due}{Total\ amount\ of\ all\ on\ balance\ sheet\ exposures, excluding\ equity} > 1\%$$

By contrast, the structures applied in euro area countries which set a relative threshold are summarised below.

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[6] For exposures over €2.5 million, a maximum threshold of €50,000 applies.

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Table 2

Structure of the relative threshold in relevant countries

Country	Structure of the relative threshold
Austria	$$\frac{\text{Credit obligations past due}}{\text{Total amount of onbalance sheet exposures + unused limits}} > 2.5\%$$
Cyprus	A specific calculation for retail exposures is foreseen where no relative threshold applies for general products, whereas a threshold of 10% based on the contractual limit of the account applies for current accounts.
Germany	$$\frac{\text{Total amount of on − balance sheet exposures, excluding equities − total advised limits}}{\text{Total advised limits}} > 2.5\%$$
Greece	Calculations are carried out at facility level only, with a threshold set at 2% of the current limit of the underlying exposure for revolving facilities (regardless of the drawn/undrawn amounts) and 5% of a regular instrument for amortised or fixed-term exposures.
Italy	$$\frac{\text{Credit obligations past due − undrawn amount}}{\text{Total amount of onbalance sheet exposures}} > 5\%$$
Slovenia	$$\frac{\text{Credit obligations past due}}{\text{Total amount of onbalance sheet exposures}} > 2\% \text{ (cap at €50,000)}$$

Source: ECB.

Table 2 shows that some countries share similar structures. However, Slovenia is the only country currently applying the structure required by the RTS.

No separate materiality threshold for default detection at facility level is set by competent authorities in euro area countries.

Finally, as regards institutions' specific thresholds, the following table provides examples of individual thresholds currently set by some institutions using the internal ratings-based (IRB) approach.

Table 3 reveals a vast disparity for corporate exposures and highlights the absence of relative thresholds. Moreover, the segmentation of thresholds is not always aligned within the same asset class.

Table 3

Examples of institution-specific thresholds

Bank	Residential mortgages	Retail SME	Corporate SME
Bank 1	3.1 monthly instalments or €0	€125 or €500 (historical difference due to merger)	€5,000
Bank 2	€0	€250	€250
Bank 3	€1,000	€1,000	€5,000
Bank 4	€500	N/A	N/A
Bank 5	€100	-	€500
Bank 6	€200	€1,000	€25,000

Source: ECB.

The examples presented above show that these institutions do not set a separate materiality threshold for default detection at facility level.

The collection of practices presented in this chapter reveals a wide disparity in the application of the materiality threshold within the SSM. The vast range of materiality thresholds currently in place, combined with bank-specific cases, underlines the need for harmonisation in order to improve the comparability of risk-weighted assets. A consistent application of the materiality threshold within the SSM will also help reduce the burden of compliance for cross-border groups.

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3   Policy options

This chapter presents the main policy options which the ECB sees as potentially suitable for defining the materiality threshold according to the RTS.

The application of the absolute and relative components of the threshold is assessed, in Sections 3.1 and 3.2 respectively, with regard to the total on-balance sheet exposures to the obligor of the institution, the parent undertaking of that institution or any of its subsidiaries, excluding equity exposures. If the definition of default is applied at obligor level, the total on-balance sheet exposure excluding equity corresponds to the total amount of the credit obligation of the obligor towards the institution (including the parent undertaking and any of its subsidiaries). If the definition of default is applied at facility level, the total on-balance sheet exposure excluding equity corresponds to the amount of the credit obligation of the obligor that results from a single credit facility. Finally, Section 3.3 looks at the possible setting of a separate threshold for retail exposures at facility level.

3.1   Absolute component

As the absolute component of the materiality threshold is only binding for obligors to which the institution has a rather small total on-balance exposure excluding equity, the choice of this absolute component has a limited impact on the classification of past due exposures as material.

The following examples serve to clarify how this works.

Example 1

The total on-balance sheet exposure of the institution, excluding equity, to a customer holding only retail exposures is equal to €9,000 and the sum of all amounts past due is equal to €95. The relative component of the threshold would be €90 (1% of €9,000).

With an absolute component of the threshold of €100, the credit obligation past due would not result as material, because only the relative component of the threshold is exceeded (95 > 90 but 95 < 100). Hence, there is no need to start counting the days on which both of the limits are exceeded, meaning that, during the next 90 days a default of the credit obligation will not be triggered by the past due criterion (however, it could still be triggered by the unlikeness-to-pay criterion).

With an absolute component of the threshold of €50, the credit obligation past due would result as material, because both the absolute and the relative components of the threshold are exceeded (95 > 50 and 95 > 90). Hence, the days on which both of the limits are exceeded start to be counted, and after 90 consecutive days on

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which both of the limits are exceeded, the credit obligation will be considered as defaulted on the basis of the past due criterion.

Example 2

The total on-balance sheet exposure of the institution, excluding equity, to a customer holding only retail exposures is equal to €11,000 and the sum of all amounts past due is equal to €120. The relative component of the threshold would be €110 (1% of €11,000).

With an absolute component of the threshold of €100, the credit obligation past due would result as material, because both the absolute and the relative components of the threshold are exceeded (120 > 100 and 120 > 110). A default will be triggered after 90 consecutive days on which both of the limits are exceeded.

With an absolute component of the threshold of €50, the credit obligation past due would also result as material, because both the absolute and the relative components of the threshold are exceeded (120 > 50 and 120 > 110).

The examples above show that, assuming that the relative component is set at 1%, the choice of the absolute component would have an impact on a limited set of past due exposures:

- Setting the absolute threshold lower than €100 for retail exposures would make a difference only for obligors to which the institution has total on-balance sheet retail exposures excluding equity lower than €10,000 (**Chart 2**).

- Setting the absolute threshold lower than €500 for non-retail exposures would make a difference only for obligors to which the institution has total on-balance sheet non-retail exposures excluding equity lower than €50,000 (**Chart 3**).

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Chart 2

Materiality threshold – absolute component set at cap value
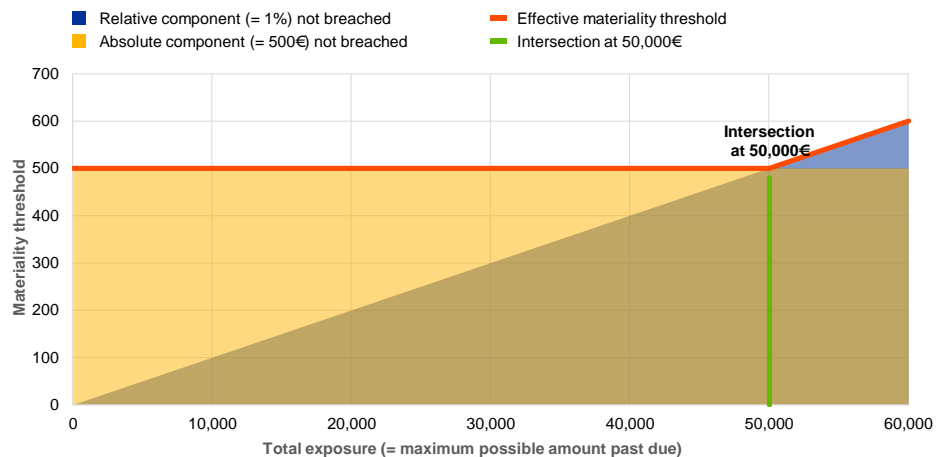
Retail exposures

(EUR)
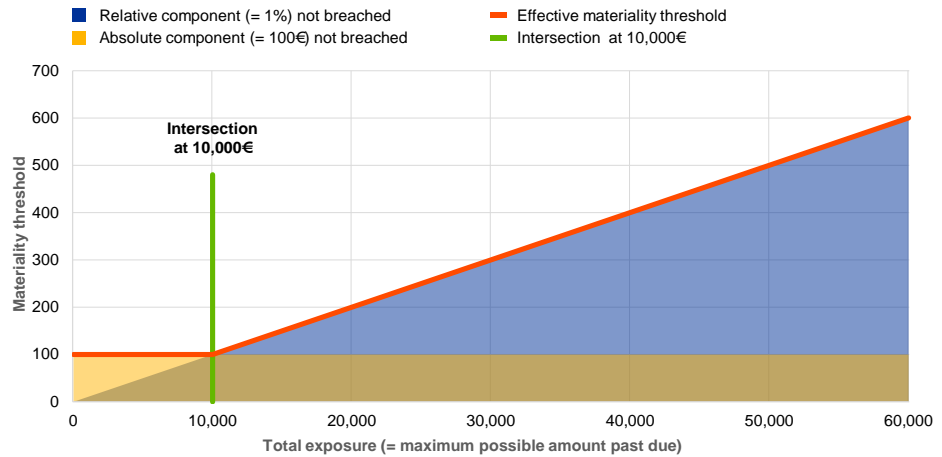
Source: ECB.

Chart 3

Materiality threshold – absolute component set at cap value

Non-retail exposures

(EUR)

Source: ECB.

In view of the above considerations, it might be argued that the absolute component of the threshold should not be set at a level equal or close to zero, as this would result in the relative threshold being the only binding component for the classification of material past due exposures, thus undermining the framework set out in the RTS. The lower the total on-balance exposure excluding equity, the lower the relative component of the threshold. An approach based solely on a relative component would therefore be less efficient in identifying actual material defaults. It would not filter out defaults on small amounts past due that are likely to result from other circumstances than financial difficulties of an obligor.

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3.2 Relative component

The choice of the relative component of the materiality threshold has an impact on the classification of past due exposures as material, since it is the binding component of the materiality threshold for obligors to which the institution, the parent undertaking of that institution or any of its subsidiaries have the largest total on-balance exposure excluding equity.

Three different options were considered as suitable for the definition of the relative component of the materiality threshold. The options are:

- Baseline – relative component set at 1%;

- Lower limit – relative component set at 0%;

- Upper limit – relative component set at 2.5%.

3.2.1 Baseline

The RTS provide that the relative component of the threshold should be set at the baseline level of 1% whenever that percentage reflects a level of risk that the competent authority considers to be reasonable. Moreover, Article 4 of the RTS states that a competent authority setting the relative component of the materiality threshold at a higher or lower percentage than 1% must substantiate that choice to the EBA.

Example 3

The total on-balance sheet exposure of the institution, excluding equity, to a customer holding only retail exposures is equal to €9,000, and the sum of all amounts past due is equal to €95.

With an absolute component of the threshold set at €100 and a relative component set at 1% (i.e. €90), the credit obligation past due would not be material, because only the relative component of the threshold is exceeded but not the absolute component (95 > 90 but 95 < 100).

Example 4

The total on-balance sheet exposure of the institution, excluding equity, to a customer holding only retail exposures is equal to €11,000 and the sum of all amounts past due is equal to €120.

With an absolute component of the threshold set at €100 and a relative component set at 1% (i.e. €110), the credit obligation past due would be material, because both the absolute and the relative components of the threshold are exceeded (120 > 100

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and 120 > 110). A default will be triggered if the credit obligation past due exceeds the materiality threshold for more than 90 consecutive days.

The examples above show that, assuming an absolute component of the threshold set at €100, the level of the relative component of the threshold is irrelevant for retail credit obligations if the total on-balance sheet exposure of the institution to the obligor, excluding equity, is below €10,000. The same reasoning applies to non-retail exposures, for which the cut-off amount of the institution's total on-balance sheet exposure excluding equity is €50,000, assuming an absolute component of the threshold set at €500.

Chart 4

Materiality threshold – relative component (baseline)
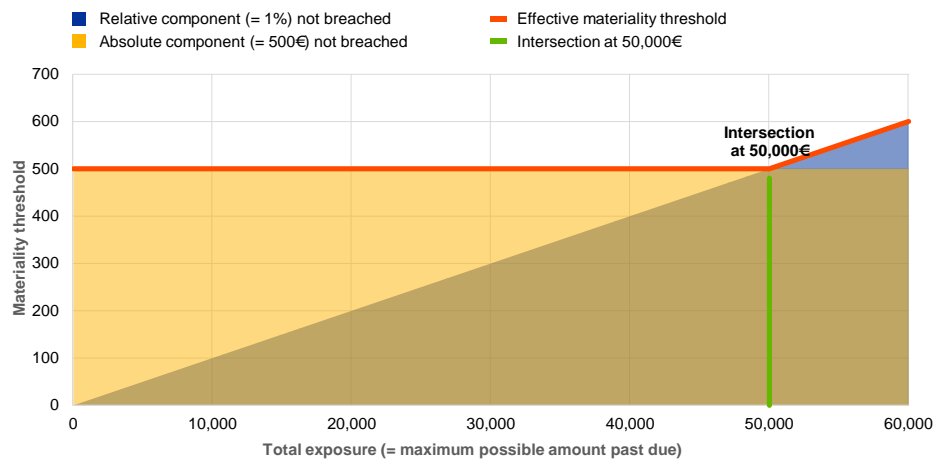
Retail exposures

(EUR)
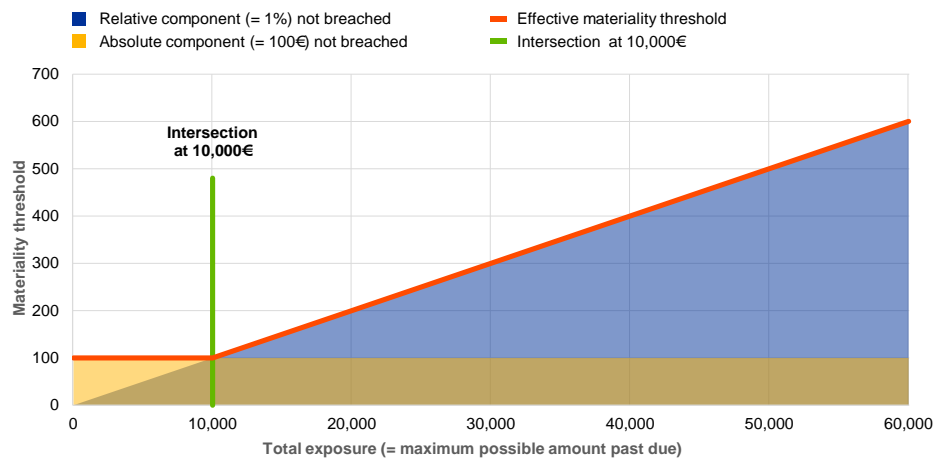
Source: ECB.

Chart 5

Materiality threshold – relative component (baseline)

Non-retail exposures

(EUR)

Source: ECB.

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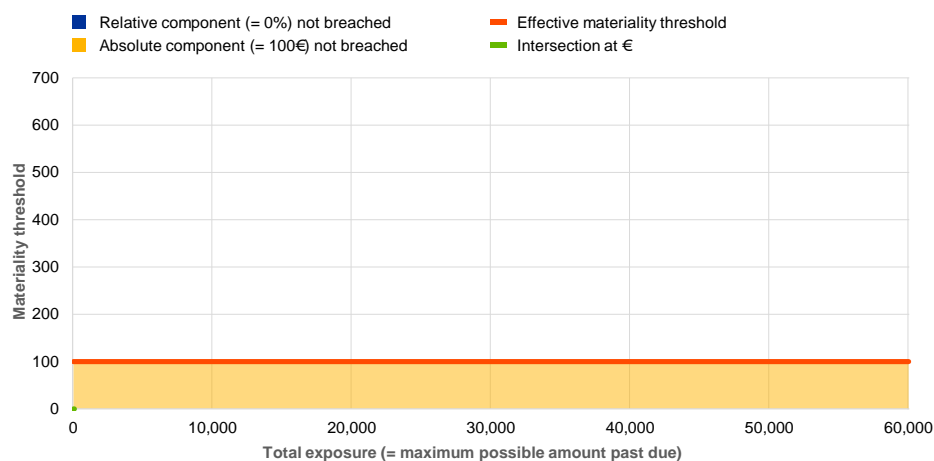
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3.2.2 Lower limit

The lower limit alternative, i.e. relative component set at 0%, is the lower limit that can be set for the relative component of the materiality threshold if a competent authority considers that 1% does not reflect a reasonable level of risk.

In effect, the lower limit alternative equates to not having any relative component of the materiality threshold: the classification of materiality would be driven solely by the absolute component (see **Chart 6** and **Chart 7** in which the absolute component of the threshold is assumed to be set at its cap value).

Chart 6

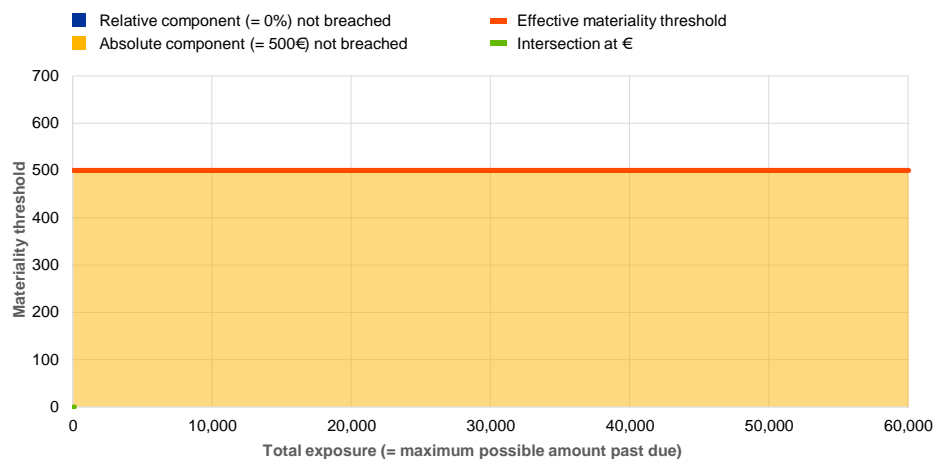Materiality threshold – relative component (lower limit)

Retail exposures

(EUR)

Source: ECB.

Chart 7

Materiality threshold – relative component (lower limit)

Non-retail exposures

(EUR)

Source: ECB.

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3.2.3 Upper limit

The upper limit alternative, i.e. relative component set at 2.5%, is the upper limit that can be set for the relative component of the materiality threshold if a competent authority considers that 1% does not reflect a reasonable level of risk.

Example 5

The total on-balance sheet exposure of the institution, excluding equity, to a customer holding only retail exposures is equal to €3,000 and the sum of all amounts past due is equal to €85.

With an absolute component of the threshold set at €100 and a relative component set at 2.5% (i.e. €75), the credit obligation past due would not be material, because only the relative component of the threshold is exceeded but not the absolute component (85 > 75 but 85 < 100).

Example 6

The total on-balance sheet exposure of an institution, excluding equity, to a customer holding only retail exposures is equal to €5,000 and the sum of all amounts past due is equal to €150.

With an absolute component of the threshold set at €100 and a relative component set at 2.5% (i.e. €125), the credit obligation past due would be material, because both the absolute and the relative components of the threshold are exceeded (150 > 100 and 150 > 125). A default will be triggered if the credit obligation past due exceeds the materiality threshold for more than 90 consecutive days.

The examples above show that, assuming an absolute component of the threshold set at €100, the level of the relative component of the threshold is irrelevant for retail credit obligations if the total on-balance sheet exposure of the institution to that obligor, excluding equity, is below €4,000 (**Chart 8**). The same reasoning applies to non-retail exposures, where the cut-off amount of the total on-balance sheet exposure of the institution to that obligor, excluding equity, is €20,000 (**Chart 9**), assuming an absolute component of the threshold set at €500.

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Chart 8

Materiality threshold – relative component (upper limit)
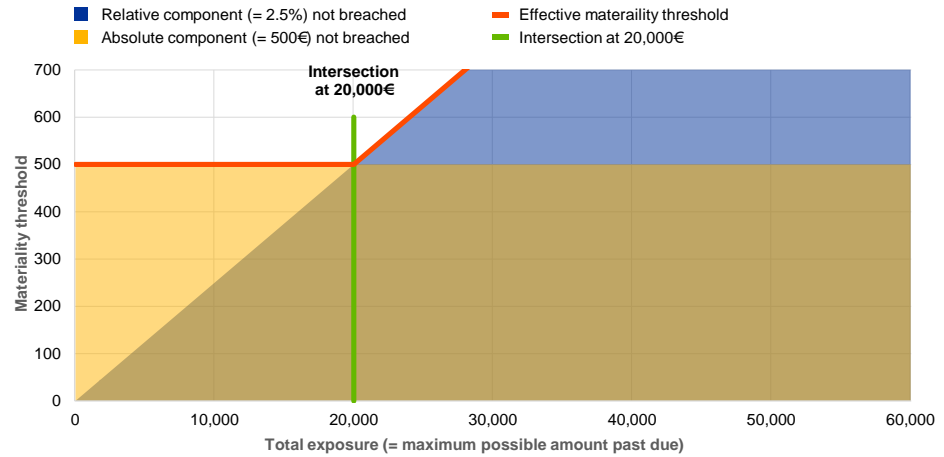
Retail exposures

(EUR)
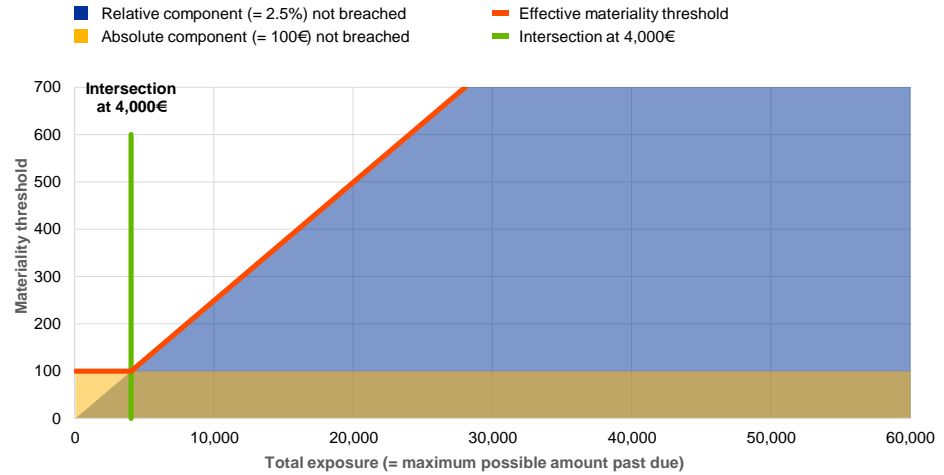
Source: ECB.

Chart 9

Materiality threshold – relative component (upper limit)

Non-retail exposures

(EUR)

Source: ECB.

3.2.4 Comparison of the alternatives

The three possible settings of the relative component of the materiality threshold, namely the baseline scenario and the upper and lower limits are shown in **Chart 10** for retail exposures and in **Chart 11** for non-retail exposures.

Assuming an absolute component of the threshold set at €100 for retail and €500 for non-retail exposures implies that for retail exposures smaller than €4,000 and non-

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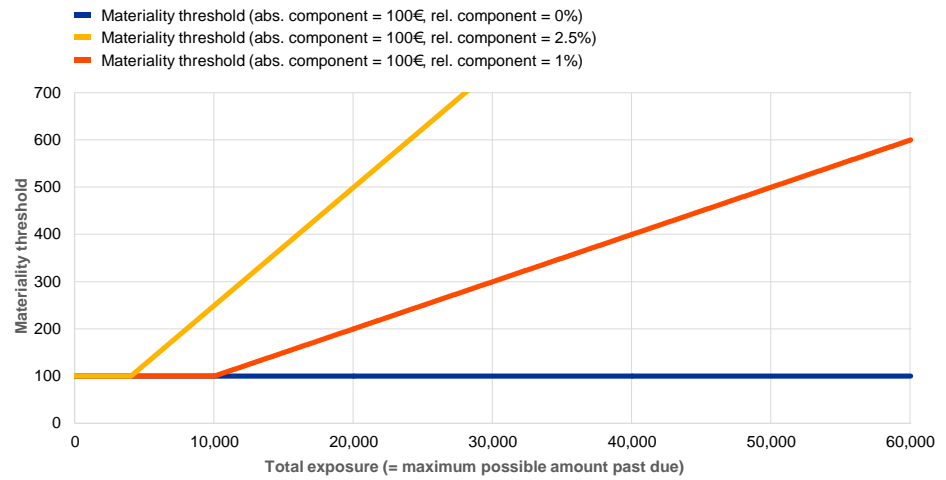
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retail exposures smaller than €20,000, thresholds under the three possible settings are identical, i.e. only the absolute component is relevant. For larger exposures, the relative component becomes constraining above a certain amount, depending on its level. The materiality thresholds differ under the three possible settings, with that with a relative component of 0% being the most restrictive and that with a relative component of 2.5% being the most lenient.

Chart 10

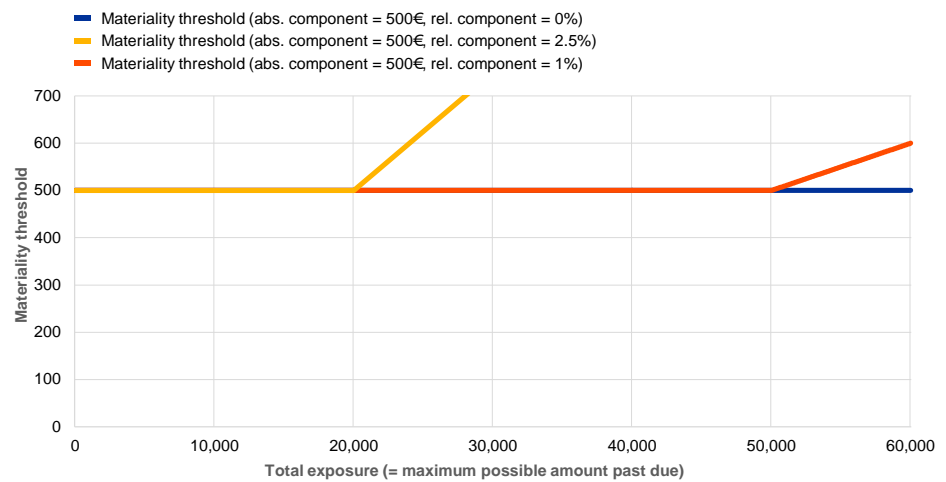Materiality threshold – relative component (comparison)

Retail exposures

(EUR)

- Materiality threshold (abs. component = 100€, rel. component = 0%)
- Materiality threshold (abs. component = 100€, rel. component = 2.5%)
- Materiality threshold (abs. component = 100€, rel. component = 1%)

Chart 11

Materiality threshold – relative component (comparison)

Non-retail exposures

(EUR)

- Materiality threshold (abs. component = 500€, rel. component = 0%)
- Materiality threshold (abs. component = 500€, rel. component = 2.5%)
- Materiality threshold (abs. component = 500€, rel. component = 1%)

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3.3 Materiality threshold at facility level

As detailed in Section 1.2, the competent authority may set a separate single materiality threshold for retail exposures for institutions applying the definition of default at the level of an individual credit facility.

Against this background, the viability of this option has been investigated. On the one hand, it is deemed that the materiality threshold at facility level should not be higher than the materiality threshold at obligor level in order to ensure conservativeness, considering that by definition the amounts past due of a single facility are lower than the overall amount past due of the obligor. On the other hand, setting the materiality threshold at facility level at a lower level than the materiality threshold at obligor level might generate unintended consequences, as illustrated by the examples below.
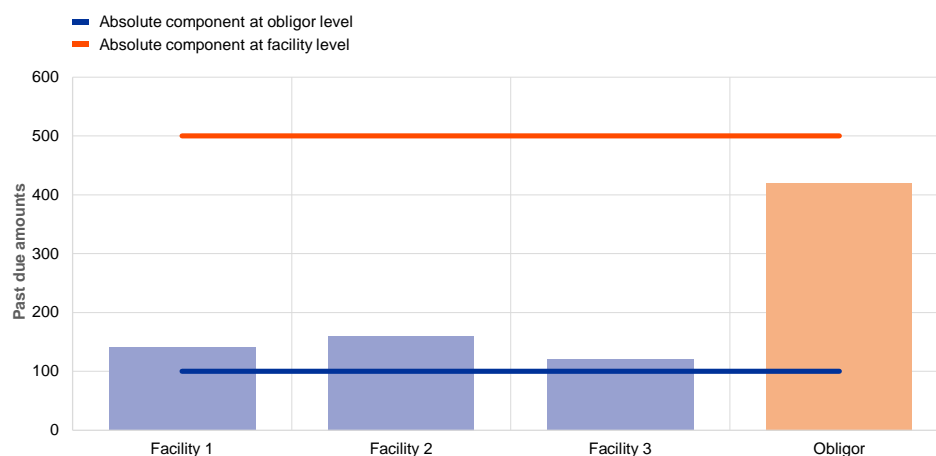
Example 7

The absolute component of the materiality threshold is set at €500 at obligor level and €100 at facility level. An obligor holds three facilities, all classified as retail exposures, and they present €140, €160 and €120 past due respectively. The sum of all amounts past due of the obligor is therefore €420.

Chart 12
Absolute component at facility level lower than absolute component at obligor level

Obligor's facilities

(EUR)

— Absolute component at obligor level
— Absolute component at facility level

Source: ECB.

In this example, the amounts past due of all facilities exceed the absolute component of the materiality threshold at facility level, i.e. all amounts past due are material at facility level, whereas the overall amount past due does not exceed the absolute component of the materiality threshold at obligor level, i.e. the overall amount past due is not material.

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On one hand, it is reasonable that if the obligor holds some small facilities with material amounts past due at facility level that can be offset against other performing facilities, the overall amount past due might be not material at obligor level. On the other hand, the pattern shown in the example is counterintuitive, because if **all** facilities owned by the obligor show material amounts past due, it is reasonable to expect that these amounts past due are also material at obligor level given that they cannot be offset against any other facilities.

If all facilities exceed a given level of the absolute component, this level is also exceeded if the absolute component is assessed at obligor level. Therefore, setting the same level of the absolute component at facility and obligor level would prevent cases such as the one in this example.
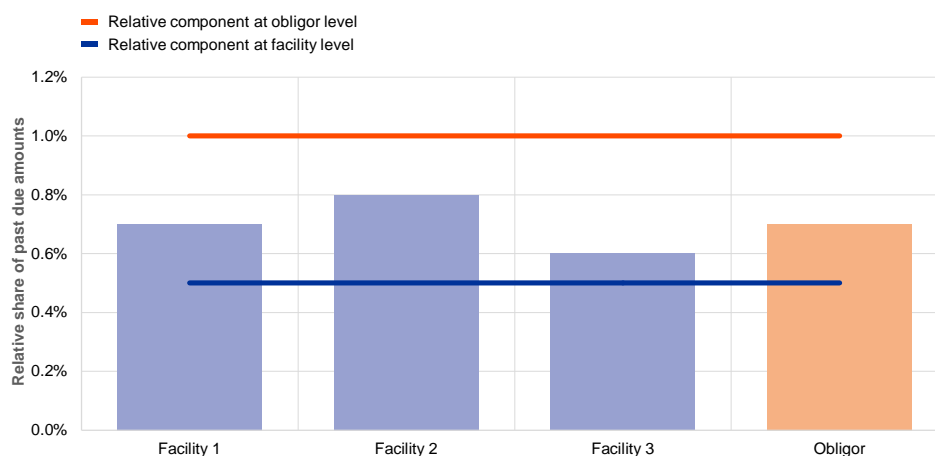
Example 8

The relative component of the materiality threshold is set at 1% at obligor level and 0.5% at facility level. An obligor holds three facilities, all of them classified as retail exposures, each with €20,000 drawn and outstanding amount. The facilities show €140, €160 and €120 past due, respectively. Therefore, the sum of all amounts past due of the obligor is €420 and the overall on-balance sheet exposure of the institution, excluding equity, to the obligor is €60,000.

Chart 13

Relative component at facility level lower than relative component at obligor level

Obligor's facilities

(EUR)

Source: ECB.

In this example, the amounts past due of all facilities exceed the relative component of the materiality threshold at facility level, whereas the overall amount past due does not exceed the relative component at obligor level. As in the previous example, the pattern shown here is counterintuitive because if **all** facilities owned by the obligor show material amounts past due, it is reasonable to expect that these

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amounts past due are also material at obligor level, given that they cannot be offset against any other facilities.

If all facilities exceed a given level of the relative component, this level is also exceeded[7] if the relative component is assessed at obligor level. Therefore, setting the same relative component at facility and obligor level would prevent cases such as the one in this example.

In view of the above considerations and examples, the ECB deems that no separate single materiality threshold should be set at facility level.

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[7] The relative component of the threshold assessed at obligor level is the average of the relative components assessed at facility level weighted by the on-balance sheet exposure of each facility excluding equity.

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4 Analysis of potential costs and benefits

This chapter presents a framework for analysing the costs and benefits of the suitable policy options for the materiality threshold identified in the previous chapter. The framework consists of qualitative categories for comparing the options, complemented with quantitative elements.

4.1 Framework

The choice of the materiality threshold should fulfil the requirements set out in Article 178(2)(d) CRR and the RTS. It will influence the institutions' core processes, such as default identification, which have a wide-ranging impact on risk management. Different elements must therefore be taken into account in order to comprehensively assess the costs and benefits of the suitable policy options.

The RTS provide that the relative component of the materiality threshold should be set at 1% whenever that percentage reflects a reasonable level of risk and that the materiality threshold is deemed to reflect a reasonable level of risk "where that threshold neither leads to the recognition of an excessive number of defaults that are due to other circumstances than financial difficulties of an obligor nor to significant delays in the recognition of defaults that are due to financial difficulties of an obligor". Both conditions should be taken into account when assessing the policy options.

The past due criterion in the default identification is influenced by the interplay between the structure of the materiality threshold given in the RTS; the level of this threshold, to be set by the ECB within the constraints defined in the RTS; and the provisions of Chapter 4 of the EBA Guidelines on the application of the definition of default under Article 178 CRR, with which the ECB intends to comply in full. The policy options chosen by the ECB and other NCAs in their respective jurisdictions might therefore lead to different levels of harmonisation in the default identification. This element should be taken into account when assessing the options, also in light of the need to foster consistency in the implementation of the definition of default for cross-border institutions.

The definition of default under Article 178 CRR is strongly linked to the concept of non-performing exposure (NPE) as defined in the EBA's implementing technical standards on supervisory reporting[8]. Therefore, the choice of the level of the materiality threshold might have an impact on the management of NPEs that should be taken into account when assessing the policy options.

The choice of the materiality threshold influences the consistency between the definition of default under Article 178 CRR and that under the International Financial

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[8] Commission Implementing Regulation (EU) No 680/2014 laying down implementing technical standards with regard to supervisory reporting of institutions according to Regulation (EU) No 575/2013 of the European Parliament and of the Council Text with EEA relevance (OJ L 191, 28.6.2014, p. 1).

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Reporting Standard 9 (IFRS 9) for the purpose of identifying credit-impaired exposures. The level of consistency achieved should be taken into account when assessing the policy options.

As the materiality threshold influences default identification this, in turn, has an impact on the calculation of own funds requirements for credit risk. At first, the adoption of a threshold might change the perimeter of exposures classified as defaulted, triggering a different treatment for the purpose of the own funds requirements calculation on some exposures, both under the standardised approach (SA) and the IRB approaches. Moreover, for IRB institutions, changes in the default identification process might justify the need for a recalibration of probability of default (PD), loss given default (LGD) and credit conversion factors (CCF) models and might reduce the representativeness of historical data collected under a different default definition. The impact on own funds requirements and on IRB models should be taken into account when assessing the policy options.

Institutions will have to adjust their systems and procedures in order to implement the calculation of days past due in light of the structure of the materiality threshold given by the RTS. In some countries, the choice of the materiality threshold at a level other than 0% might have an influence on the complexity of these adjustments which should be taken into account when assessing the policy options.

To sum up, the impact on all the following elements is to be taken into account when performing the analysis of costs and benefits of the suitable policy options for the definition of the materiality threshold:

- defaults that do not result from financial difficulties;

- delays in the recognition of defaults;

- level of harmonisation;

- non-performing exposures (NPE);

- credit-impaired exposures (IFRS 9);

- own funds requirements;

- models under the IRB approach;

- IT implementation.

The impact of the suitable policy options on these elements is analysed in Section 4.2, mainly by means of qualitative arguments and examples. This section focuses mainly on the relative component of the materiality threshold since, as outlined in Chapter 3, this component has the most relevant impact on the classification of past due exposures as material or not.

Section 4.3 then complements some of the arguments with quantitative analyses based on actual data collected from some institutions, with a view to verifying to what

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extent the level of the materiality threshold may affect the assessment of the reasonable level of risk.

4.2   Qualitative elements

4.2.1   Defaults that do not result from financial difficulties

The RTS require the relative component of the threshold to be set at 1% whenever this reflects a reasonable level of risk. The first condition for a materiality threshold to reflect a reasonable level of risk is that it should not lead to the recognition of an excessive number of defaults that are due to other circumstances than financial difficulties of an obligor.

Setting the relative materiality threshold at a low level leads to a higher number of defaults, triggered by the days past due criterion, that are due to other circumstances than financial difficulties. However, these defaults will most likely return to non-defaulted status in a short period of time, thus increasing institutions' cure rates.

Nevertheless, since the exceedance of the materiality threshold does not trigger a default immediately, as it must persist for 90 consecutive days before the obligor is considered to be in default, the institution has 90 days either to (i) take measures persuading the obligor to pay the amount past due or (ii), if deemed appropriate, grant the obligor a larger limit or additional credit products suitable for its needs. Those measures might result in one of the following three outcomes.

1.   The credit obligation is no longer past due.

2.   The credit obligation remains past due, but it is no longer material.

3.   The credit obligation remains past due and it is still material. In this situation, the institution may trigger the default via the unlikeliness to pay criterion if the 90 days past due are not exceeded or wait until the 90 days are exceeded and the default is triggered automatically.

It can hence be argued that the level of the materiality threshold has an immediate impact on the moment of initiating actions aimed at reducing the credit obligation past due back to an immaterial amount past due. This, in turn, implies that defaults triggered by the days past due criterion and due to other circumstances than financial difficulties of an obligor should be infrequent, provided that institutions' processes are effective, thus smoothening the impact of a low level of the relative materiality threshold on cure rates.

This theoretical conclusion is confirmed by the evidence of the quantitative analysis of cures presented in Section 4.3.

4.2.2 Delays in the recognition of defaults

The RTS require the relative component of the threshold to be set at 1% if this reflects a reasonable level of risk. The second condition for a materiality threshold to reflect a reasonable level of risk is that it should not lead to significant delays in the recognition of defaults that are due to financial difficulties of an obligor. The analysis of delays in the recognition of defaults, particularly if the relative component is assumed to be equal to 1%, is therefore paramount for the assessment of the policy options.

In this section it is assumed that the financial difficulties of an obligor imply an abrupt stop[9] of principal and interest payments and that a default is triggered by the past due criterion, i.e. whenever the amounts past due exceed the materiality threshold for 90 consecutive days. Therefore, the time in which the past due amount reaches a level that exceeds the threshold can be seen as a delay in the recognition of default.

Consider an obligor, owning one credit obligation, which starts missing payments due to financial difficulties and assume that the first missed payment exceeds the absolute component of the threshold. In such a case, the delay in the recognition of default will be driven solely by the relative component of the threshold: if this component is set at 0%, then there is no delay at all, i.e. the days past due are counted as of the first missed payment; if the relative component is set at a higher level, a delay might occur since the days past due would not be counted until more than one payment has been missed.

Chart 14
Delay in the recognition of the default

Credit obligation with monthly payments

(EUR, months)
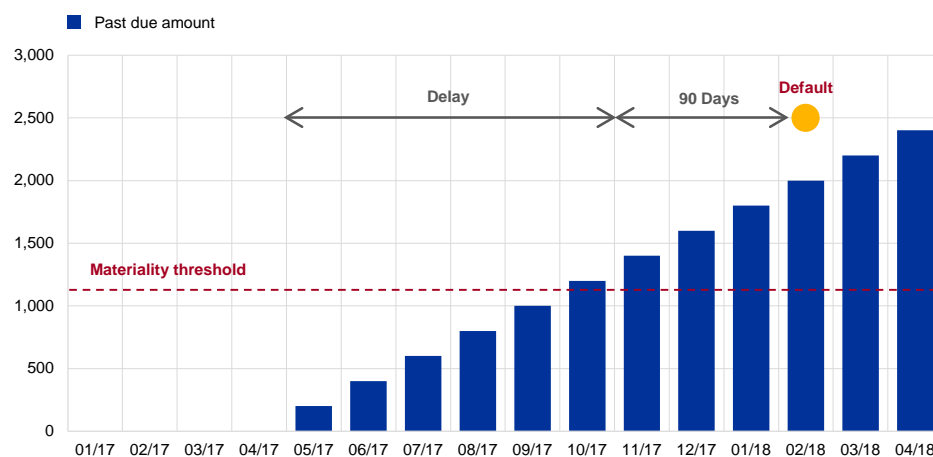
Source: ECB.

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9 This assumption is particularly applicable to retail portfolios with automated processes, even though customers who missed payments may recover before the default according to the past due criterion is triggered. The missed payments are in that case likely to stem from causes other than financial difficulties. However, this cannot usually be assessed ex ante.

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If the definition of default is applied at the level of the obligor, the exceedance of the relative component of the threshold should be verified by comparing all credit obligations past due with the total amount of all on-balance sheet exposures of the institution to that obligor, excluding equity exposures. This means that the variety of credit obligations owned by an obligor influences the verification of the exceedance of the relative component. However, in order to investigate the delays in the recognition of defaults, only examples where an obligor owes only one credit obligation are considered. This is equivalent to assuming that the definition of default is applied at credit facility level, an assumption that implies the highest sensitivity of default recognition with respect to the relative component of the materiality threshold, since amounts past due stemming from one facility cannot be compensated for by possible exposures on other facilities without amounts past due. Hence, all arguments set out below apply to both a materiality threshold at obligor level and a materiality threshold at facility level.

4.2.2.1 Loans

Assume that an obligor owns only one loan and starts missing payments due to financial difficulties. In order to quantify the delay in the recognition of default, the number of payments that need to be missed in order to exceed the relative component of the threshold should be identified, assuming that the absolute component is exceeded with the first missed payment.

Consider the following assumptions:

- the loan schedule entails F periodic payments per years, i.e. F=12 for monthly payments;

- the first payment missed by the obligor is the T-th in the loan schedule;

- the obligor keeps missing payments because it is facing strong financial difficulties and is no longer able to repay its debt;

- P(T-1) is the principal amount remaining after the (T-1)-th payment in the loan schedule;

- D(T,K) is the sum of the first K missed payments starting from the T-th payment in the loan schedule;

- H denotes the percentage value of the relative component of the materiality threshold.

Under the above assumptions, the number of missed payment needed to exceed the materiality threshold, K*, can be computed as follows:

$$K^* = \min\left\{ K \; such \; that \; \frac{D(T,K)}{P(T-1)} > H \right\}$$

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The days of delay in the recognition of default can be computed from the frequency of payments in the loan schedule and assuming, for simplicity, that one year is equal to 360 days:

$$\text{Delay} = (K^* - 1)\frac{360}{F}$$

This enables some initial considerations:

- the delay is driven by the loan schedule (maturity, frequency of payments, interest rate), as it influences both D(T,K) and P(T-1);

- the delay is driven by the relative threshold;

- the delay is driven by the starting moment of the financial difficulties, i.e. the first missed payment is the T-th of the loan schedule;

- the delay, under the assumption that the absolute component is exceeded with the first missed payment, is not driven by the loan amount because both D(T,K) and P(T-1) are proportional to the loan amount whereas their ratio is not.

For a comprehensive analysis of the delays, a set of realistic scenarios has been designed, featuring different settings for the main characteristics of a loan as summarised in the following table.

Table 4

Scenarios for the assessment of delays

Characteristics	Settings	# Settings
Term	From one to 30 years	30
Frequency of payment	Monthly, bimonthly, quarterly, half-yearly, yearly	5
Annual interest rate	1%, 3%, 5%, 10%	4
Amortisation schedule	Constant payments, linear, bullet	3
First missed payment	At the beginning, at 1/4 of term, at 2/4 of term, at 3/4 of term	4
Materiality threshold (relative component)	0.5%, 1%, 1.5%, 2%, 2.5%	5
TOTAL	**Any combination of the above characteristics and settings**	**36,000**

Source: ECB.

The scenarios defined in **Table 4** are based on well-known types of amortisation schedules that can be treated analytically in order to compute the number of missed payments needed to exceed the materiality threshold K*, and, in turn, the days of delay.[10]

Chart 15 summarises the distribution of delays computed over the set of scenarios, assuming a constant payments amortisation schedule and different levels, H, for the relative component of the materiality threshold.

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[10] The analytical framework for the computation of P(T-1), D(T,K) and K* according to different types of amortisation schedule is described in Annex I.

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Chart 15

Distribution of delays over scenarios

Amortisation schedule: constant payments

(percentage, days)
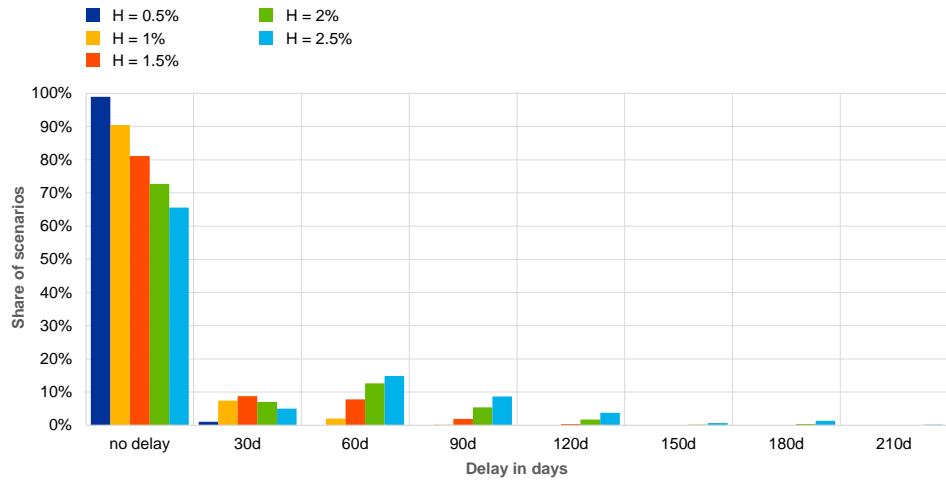
Source: ECB.

With a relative component set at 1%, almost 90% of the analysed scenarios[11] show no delays, i.e. the first missed payment already exceeds the relative component of the materiality threshold, and the majority of observed delays is around 30 days, i.e. the relative component of the materiality threshold is exceeded with the second missed payment. With the relative component at a higher level, the share of scenarios with no delays drops to 80% or even lower and the observed delays are concentrated between 60 and 90 days.

Chart 16 summarises the distribution of delays computed over the set of scenarios, assuming a linear amortisation schedule and different levels, H, for the relative component of the materiality threshold.

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[11] For a given level of the relative component and amortisation schedule, 2,400 scenarios (= 30 terms * five payment frequencies * four annual interest rates * four first missed payments) have been assessed.

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Chart 16

Distribution of delays over scenarios

Amortisation schedule: linear

(percentage, days)

■ H = 0.5%   ■ H = 2%
■ H = 1%   ■ H = 2.5%
■ H = 1.5%
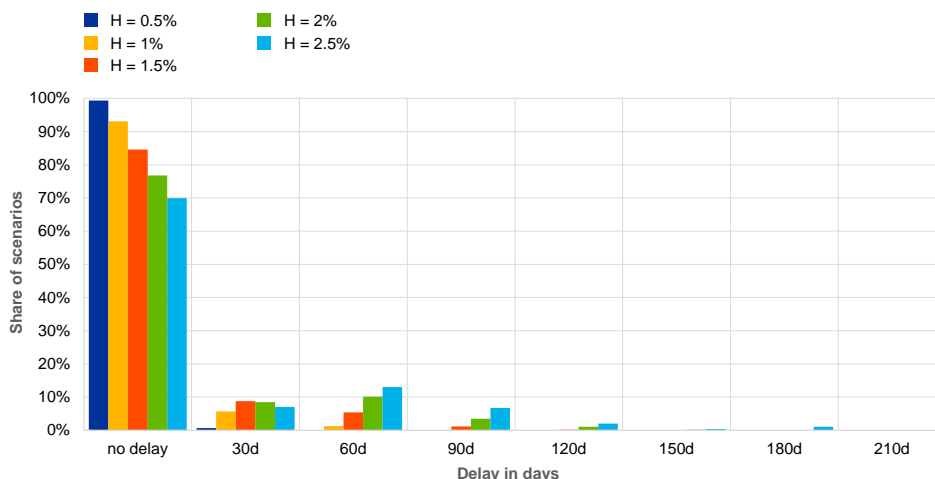
Source: ECB.

With a relative component set at 1%, almost 90% of the analysed scenarios show no delays and the most observed delays are around 30 days. With the relative component at a higher level, the share of scenarios with no delays drops to 80% or even lower and the observed delays are concentrated around 60 days.
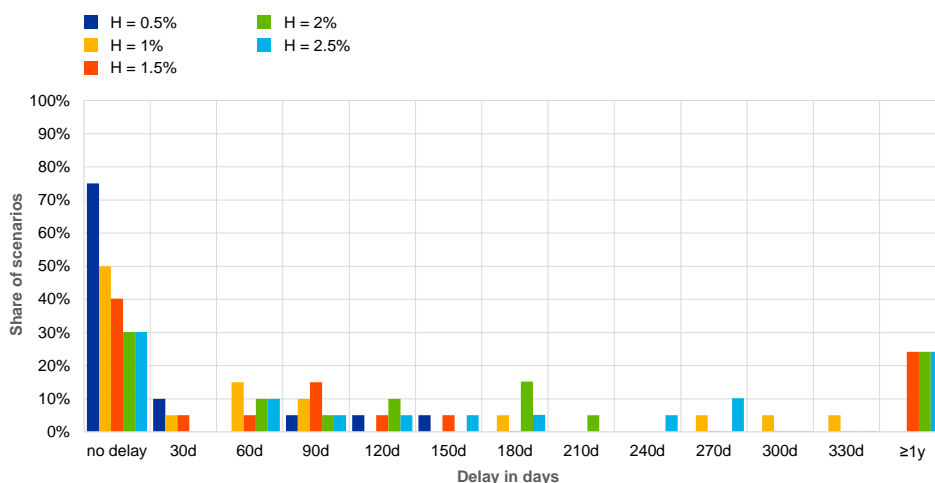
Chart 17 summarises the distribution of delays computed over the set of considered scenarios assuming a bullet loan and different levels, H, for the relative component of the materiality threshold.

Chart 17

Distribution of delays over scenarios

Amortisation schedule: bullet

(percentage, days)

■ H = 0.5%   ■ H = 2%
■ H = 1%   ■ H = 2.5%
■ H = 1.5%

Source: ECB.

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The bullet amortisation produces a general increase in the observed delays for all the considered levels of the relative component, because under this scheme only interest payments are made during the lifetime of the exposure. This means that more missed payments should be accumulated to exceed the materiality threshold compared to the other common amortisation schedules where the missed payments are higher as they include both interest and principal. With a relative component of the threshold set at 1%, the observed delays remain under one year in all of the scenarios.

Example 9: Real estate exposure with a constant payments amortisation schedule

Consider a total on-balance sheet exposure of the institution, excluding equity, to a retail customer equal to €400,000. Assuming constant monthly payments of €2,500 (broadly corresponding to a 20-year loan with an annual interest rate of 4%), and two missed payments, the past due exposure is equal to €5,000.

Assuming that the absolute component of the materiality threshold is set at the cap value as defined in the RTS (i.e. €100 for retail exposures), the absolute component is exceeded; therefore only the relative component is relevant in this example.

If the missed payments occur at the beginning of the loan, the following applies.

- With a relative threshold of 0.5% (i.e. €2,000), the past due credit obligation would be considered as material, because the relative threshold would be exceeded (5,000 > 2,000). In fact, the past due credit obligation would be material after the first missed payment and default would occur three months later (90 days). No delays are observed.

- With a relative threshold of 1% (i.e. €4,000), the past due credit obligation would be considered as material, because the relative threshold would be exceeded (5,000 > 4,000). However, the past due credit obligation would be material only after the second missed payment and default would occur four months later (one month + 90 days). About 30-day delays are observed.

- With a relative threshold of 2.5% (i.e. €10,000), the past due credit obligation would not be considered as material, because the relative threshold would not be exceeded (5,000 < 10,000). In this case, the past due credit obligation would be material only after the fifth missed payment and default would occur eight months later (five months + 90 days). About 150-day delays are observed.

Similar reasoning applies to other common amortisation schedules, e.g. linear and bullet.

In addition to the type of amortisation schedule, other main characteristics of the loan have an impact on the delays in the recognition of default. This impact has been assessed on the basis of the analysed scenarios and the formulas for the computation of delays reported above. The following behaviours occur with respect

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to the frequency of payment, the loan interest rate, the moment of the first missed payment and the loan term.

If the **frequency** of **payment** increases, the effect is twofold: on the one hand, the corresponding periodic payments decrease, implying that more payments have to be missed in order to exceed the materiality threshold. On the other hand, fewer days of delay are induced by each missed payment. The first effect proved to be dominant in the analysed scenarios, because the increase in the frequency of payment tends to be coupled with an increase in the delay. This dynamic is particularly relevant for retail exposures, where loans with a monthly payment are common and the past due criterion is dominant.
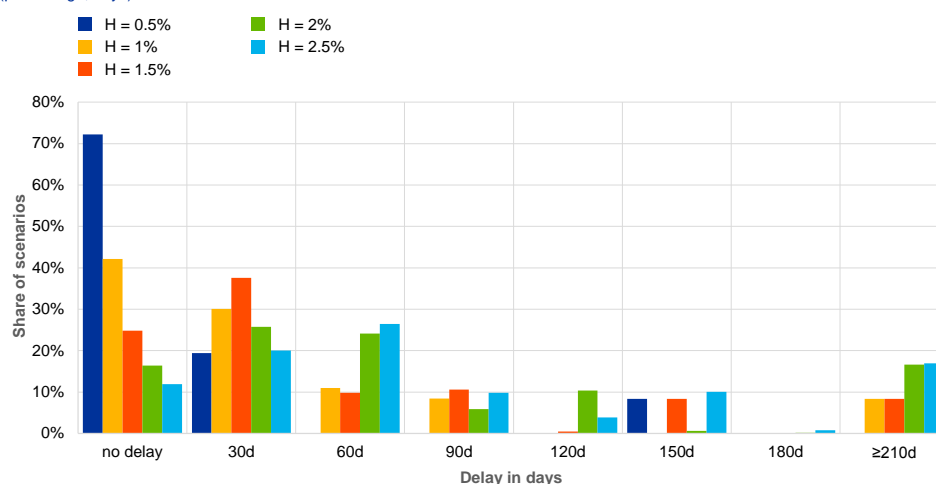
Chart 18 shows the distribution of delays for loans with monthly payments.

Chart 18

Distribution of delays over scenarios with monthly payments

Amortisation schedule: all

(percentage, days)

Source: ECB

As the chart depicts, a relative component of 0.5% and 1% implies a monotonically decreasing distribution with respect to the delay in the recognition of default.[12] The distributions peak at some non-zero delay given a relative component larger than 1%, i.e. for 1.5% and 2% at a delay of 30 days, and for 2.5% at 60 days. Hence, a relative component of the threshold set at 1% preserves the mode of no delay.

If the **loan interest rate** increases, the corresponding periodic payments increase and this, in turn, contributes to reducing delays as fewer payments have to be missed in order to exceed the materiality threshold. This also means that delays in the recognition of default are lower for riskier obligors, since they are usually charged with higher interest rates than less risky obligors in order to compensate for their higher credit risk.

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[12] The bucket >=210 days is populated by loans with bullet amortisation schedule, which show an erratic distribution of delays compared to the other schedules, as shown in **Chart 17**.

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The **moment of the first missing payment** due to financial difficulties has an impact on the delays under constant payment or linear amortisation schedules: if the first payment is missed close to the end of the loan schedule, the outstanding principal will be relatively low and this, in turn, contributes to reducing delays as less payments have to be missed in order to exceed the materiality threshold. In case of bullet loans, delays are not affected by the moment when financial difficulties start, since the outstanding principal is constant till the last payment.

If the **loan term** increases, the corresponding periodic payments decrease under constant payments and linear amortisation schedules and this, in turn, inflates delays as more payments have to be missed in order to exceed the materiality threshold. The maturity has no impact for bullet loans, neither on the periodic payments nor on the repayment of principal. This implies that delays for bullet loans are unaffected by the term.

In the following, delays induced when the relative component of the materiality threshold is set a 1% are analysed in more detail.

As outlined before, under constant payments or linear amortisation schedules, no delay at all is observed in about 90% of the analysed scenarios when the relative component is set at 1%. For these types of amortisation, the average delays observed in groups of scenarios having similar features are summarised in **Table 5**. Cells are left blank if no delays are observed.

Table 5

Average delays with relative component set at 1%

Constant payments and linear amortisation schedule

(number of days)

Payment frequency	Maturity	Moment of first financial difficulties															
		Beginning				1/4 of duration				2/4 of duration				3/4 of duration			
		Interest rate															
		1%	3%	5%	10%	1%	3%	5%	10%	1%	3%	5%	10%	1%	3%	5%	10%
Yearly & Half-yearly	1y - 10y																
	11y - 20y																
	21y - 30y																
Quarterly	1y - 10y																
	11y - 20y																
	21y - 30y	9															
Bi-monthly	1y - 10y																
	11y - 20y	9															
	21y - 30y	60	21			30											
Monthly	1y - 10y	5	2														
	11y - 20y	35	29	24	5	27	21	12		9	2			9	2		
	21y - 30y	63	41	30	15	45	30	30	11	30	29	17		30	29	17	

Source: ECB.

For constant payments or linear amortisation schedules, the analysis of average delays further confirms that delays occur only in a few cases and under specific

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conditions of the loan, namely when the term is longer than ten years, the frequency of payment is bimonthly or monthly, the interest rate is rather low and the financial difficulties emerge during the first quarter of the loan term. The average delays are usually less than 30 days and they reach up to their maximum, i.e. around 60 days, only in exceptional cases, characterised by very long maturities, very low interest rates and financial difficulties occurring from the beginning.

For bullet loans, no delay at all is observed in about 40% of the analysed scenarios when the relative component is set at 1%. For this kind of loan, the average delays observed in groups of scenarios having similar features are summarised in **Table 6**. Cells are left blank if no delays are observed. Only the interest rate and the frequency of payment are considered for grouping scenarios, since they are the only features which drive the delays for bullet loans.

Table 6

Average delays with relative component set at 1%

Bullet loans

(number of days)

Payment frequency	Interest rate			
	1%	3%	5%	10%
Yearly				
Half-yearly	180			
Quarterly	270	90		
Bimonthly	300	60	60	
Monthly	330	90	60	30

Source: ECB.

The number of scenarios where delays occur and the average length of delays are higher for bullet loans due to the peculiarity of this type of repayment schedule. With the relative component of the materiality threshold set at 1%, the average delays are still below 90 days for medium to high interest rates, but they can rise up to 11 months if the interest rate is low and the frequency of payment is high. Nevertheless, these longer delays do not raise concerns regarding the level of the materiality threshold, because it is expected that the past due criterion plays a minor role in bullet loans. As the principal is repaid in full on maturity of the loan, institutions usually evaluate the obligor's ability to repay through a comprehensive and long-term perspective that goes beyond the assessment of amounts past due caused by missed interest-only payments. For bullet loans, the default is therefore likely to be triggered by the unlikeness to pay criterion rather than by the past due criterion, implying that the estimated delays on the latter criterion are unlikely to materialise in full.

On the basis of the outcomes of the analysis of delays and the arguments reported in this section, the ECB deems that a relative component of the materiality threshold set at 1% does not lead to significant delays in the recognition of defaults that are due to financial difficulties of an obligor owning a loan.

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This theoretical conclusion is confirmed by the evidence of the quantitative analysis of delays presented in Section 4.3.

4.2.2.2 Revolving facilities

For revolving facilities (e.g. credit lines), the analysis is limited to a comparison between the baseline level of the relative component of the materiality threshold, i.e. 1%, and the highest possible level, i.e. 2.5%.

A difference in the default recognition only occurs if the amount past due lies within the window of $\max(1\% \cdot Exposure, €100)$ and $\max(2.5\% \cdot Exposure, €100)$ for retail exposures and $\max(1\% \cdot Exposure, €500))$ and $\max(2.5\% \cdot Exposure, €500)$ for non-retail exposures. The balance of a revolving facility is not expected to remain constant over time but rather to reflect several regular transactions such as invoices and salaries, etc. Hence, the balance is likely to leave this window quickly in either direction.

Consider a corporation with a credit line of €1,000,000. Differences in the counting of days past due only occur if the balance is between €1,010,000 and €1,025,000, i.e. the overdrawn amount is between €10,000 and €25,000. Typically, an enterprise with a €1,000,000 revolving facility generates payments and incomes well in excess of this window of €15,000 so the balance will not remain in this window for a long period of time.

Consider a retail facility with a limit lower than €4,000. Differences in the counting of days past due do not occur since the absolute component of the threshold determines the materiality.

In conclusion, the relative component is not expected to imply, in practice, a significant delay in the default recognition for revolving facilities.

4.2.3 Level of harmonisation

The materiality threshold defined by the ECB should be applied by SIs to identify defaults based on material past due credit obligations according to Article 178(1)(b) CRR. In addition, institutions might also decide to apply a stricter threshold (either a lower absolute or relative component) and consider the exceedance of such a stricter threshold as an indication of unlikeness to pay, triggering the default classification under Article 178(1)(a) CRR. This possibility is explicitly granted by paragraph 34 of the EBA Guidelines on the application of the definition of default, provided that the institution can demonstrate that this lower threshold is a relevant indication of unlikeliness to pay and does not lead to an excessive number of defaults that return to non-defaulted status shortly after being recognised as defaulted or to a decrease of capital requirements.

Against this background, a positive aspect of the upper limit alternative is that it would grant institutions the maximum possible flexibility in identifying past due

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exposures that they deem material enough considering their business models and the features of their customers, as they will be able to use any threshold below such an upper limit for defining indications of unlikeness to pay.

The downside is that the increased flexibility ensured by the upper limit alternative comes at the expense of a loss of harmonisation, in particular in the treatment of large exposures, as these are the most impacted by the relative component of the materiality threshold. This might lead to situations where an institution and its subsidiaries use many different thresholds across portfolios.

In addition, assuming that most euro area countries keep the baseline level of the relative component of the threshold as set in the RTS, any deviation from this level by the ECB would make it more complex for institutions to manage cross-border activities, as institutions might then need to cope with different relative thresholds across different jurisdictions. Moreover, the significance status of institutions may change over time due to changes in the significance criteria, which also implies that institutions may need to deal with different relative thresholds at a future point. Adhering to the proposed level of the relative threshold would reduce the likelihood of such situations, thus improving the harmonisation of the threshold throughout Europe as well as the simplification of processes for institutions.

4.2.4 Non-performing exposures

In line with the EBA's definition of NPE, all defaulted exposures have to be considered as non-performing. For those institutions which currently apply a relative component of the materiality threshold higher than 1%, the application of the baseline level is likely, in the short term, to produce an increase in NPEs through the increase in defaulted exposures. This pattern might conflict with any NPE reduction strategies. The reverse would be true for institutions currently applying a relative materiality threshold lower than 1%.

Against this background, the application of the upper limit alternative would help to smooth the potential increase in NPEs. Nevertheless, institutions which currently apply a threshold higher than 1% are also expected to adjust their credit risk management processes, thus reducing the short-term impact on NPE over the medium to long term.

In addition, it is worth highlighting that the final effect of a change of the relative threshold on the number of defaults is not determined solely by the level of the threshold, but also by its structure as well as the interplay with the unlikeliness to pay (UTP) criterion. With particular reference to the structure of the threshold, those countries where the current setting of the materiality threshold has a counting scheme other than that in the framework set out in the RTS (e.g. where the counting of days starts as soon as the obligation is past due instead of when the materiality threshold is exceeded) might experience counterbalancing effects (i.e. despite the threshold being lower, the counting starts later), finally resulting in the level of the threshold having a smoother impact on the number of defaults. As far as the interplay with the UTP criterion is concerned, it goes without saying that a lower level

of the relative threshold might lead to earlier identification of defaults, thus affecting the timing of default detection. However, should the financial difficulties of the obligor be concrete and provided that institutions' processes are effective, such defaults would be in any case identified through the UTP criteria and the overall number of defaults stemming from both of the default triggers might not increase significantly.

On the basis of these considerations, it does not seem feasible to quantify with a sufficient level of certainty the impact of the level of the relative component of the materiality threshold on the level of NPE.

4.2.5 Credit-impaired exposures in the IFRS 9

Under IFRS 9 Financial Instruments, published by the International Accounting Standards Board in July 2014, the occurrence of a default is one of the events that lead to the classification of exposures as credit-impaired. For the purpose of IFRS 9, banks should apply a default definition that is consistent with the definition used for internal credit risk management purposes. However, IFRS 9 contains a rebuttable presumption that default does not occur later than when a financial asset is 90 days past due, unless an entity has reasonable and supportable information to demonstrate that a more lagging default criterion is more appropriate (see B5.5.37 of IFRS 9).

As the backstop criterion for default identification suggested in the IFRS 9 is not linked to the application of a materiality threshold, it could be argued that setting the relative component of the materiality threshold to 0% for the purpose of Article 178 CRR is a way of fostering consistency between defaulted exposures under the CRR and credit-impaired exposures under the IFRS 9. However, banks could also foster such consistency in the opposite way, i.e. by adopting for the purpose of the IFRS 9 a default definition incorporating the same materiality threshold applied for the purpose of Article 178 CRR. Such an approach would be viable whenever this materiality threshold is applied for internal credit risk management purposes, considering that the backstop criterion without materiality threshold suggested in the IFRS 9 is indeed rebuttable.

4.2.6 Own funds requirements

A reduction of the relative component of the materiality threshold from the baseline level to 0% would lead to more past due exposures being considered as material (assuming that the level of the absolute component remains constant). This, in turn, would lead to the identification of a higher number of defaults. The effect on capital requirements, however, is not straightforward as it depends on the method used by the institution to calculate capital requirements.

- For institutions using the SA for credit risk, risk weights for defaulted exposures are 100% or 150% depending on the rate of credit risk adjustments. As these are the highest levels of risk weights used in most of the other exposure

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classes, it is reasonable to expect that the lower the relative component of the threshold, the higher the number of exposures with high risk weights, finally resulting in higher risk-weighted exposure amounts at institution level.

- For institutions using the foundation IRB (FIRB) approach, the risk weight of defaulted exposures is zero. However, the calculation of expected losses is based on a PD equal to 100%, i.e. a much higher PD than would be used if the exposure were not classified as defaulted. The lower the relative component, the higher the number of exposures with PD equal to 100%, finally resulting in higher expected losses. If the expected losses are not fully covered by credit risk adjustments, the difference is deducted from own funds. Moreover, the materiality threshold also impacts on the risk weights of non-defaulted exposures through PD estimates: a lower relative component results in higher default rates, therefore generating higher PD estimates and, in most cases, higher risk weights for non-defaulted exposures too.

- For institutions using the advanced IRB approach or the IRB approach for retail exposures, the impact on capital requirements is more complex. The risk weight for defaulted exposures is calculated on the basis of the best estimate of expected loss and LGD in-default estimates, and should reflect the possible unexpected loss that might occur during the recovery period. Whether the risk weight calculated in this way is higher or lower than the risk weight for non-defaulted exposures depends largely on the methodologies used by institutions. As in the FIRB approach, the level of the materiality threshold also impacts on the risk weights of non-defaulted exposures through PD and LGD estimates. With regard to PD, it goes without saying that the lower the relative component, the higher the PD estimates and, in most cases, the risk weights. For LGD, however, the impact would most likely be the reverse, because a lower relative component might result in more defaults being cured within a short period of time. This effect would decrease LGD estimates and risk weights for non-defaulted exposures. Given the relationship between risk-weighted-exposure-amounts and risk estimates through the risk-weighting functions, the final combined effect of these movements would most likely result in a reduction of risk-weighted exposure amounts.

In conclusion, setting the relative component of the materiality threshold at the baseline level of 1% might represent a reasonable compromise, given the impossibility to determine ex ante the final impact (either positive or negative) of the relative threshold on capital requirement. Moreover, as outlined in Section 4.2.4, possible relevant effects arising from an increase in defaulted exposures in the short term are expected to be mitigated in the medium and long term through adjustments to credit risk management processes.

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4.2.7   Models under the IRB approach

For IRB institutions, under Delegated Regulation (EU) 529/2014[13] a change in the definition of default always constitutes a material model change requiring prior permission from the competent authorities. Moreover, changes in the default identification process might reduce the representativeness of data collected under a different default definition. It will then be necessary to adjust historical data used for risk quantification, to recalibrate risk parameters and to incorporate an adequate margin of conservatism. Such adjustments and recalibrations will lead to changes that can be either material or non-material in accordance with Delegated Regulation (EU) 529/2014. Furthermore, during their regular review of risk estimates as referred to in Article 179(1)(c) CRR, IRB institutions should monitor the performance of the models and extend or, where justified, move the window of historical data used for risk quantification to include new data.

Against this background, the scope of analyses and actions that should be put in place by IRB institutions from an internal models perspective are the same, irrespective of the choice of the level of the materiality threshold made by the competent authority. In fact, these actions are expected to be carried out in any case, except in the highly theoretical situation where the current setting of the materiality threshold applied by an institution, both in terms of structure and level, is already perfectly aligned to the framework set out in the RTS and to the level of the threshold that will be finally determined by the ECB.

4.2.8   IT implementation

Another cost and benefit factor for institutions is the implementation of the days-past-due counter in their IT systems. If a default is not recognised at facility level, institutions need to aggregate and compare all on-balance sheet exposures to the obligor, excluding equity, and all amounts past due of the obligor. This might be a challenge if the data are stored in different data sources.

The implementation could hence generally be considered easier if the relative threshold was set at 0%. The total sum of amounts past due would then not need to be compared to the total on-balance sheet exposure to the obligor, excluding equity. However, since many jurisdictions already require a relative threshold greater than 0%, this approach would only benefit a limited number of jurisdictions.

This qualitative element is therefore not deemed essential in choosing the level of the materiality threshold.

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[13] Commission Delegated Regulation (EU) No 529/2014 of 12 March 2014 supplementing Regulation (EU) No 575/2013 of the European Parliament and of the Council with regard to regulatory technical standards for assessing the materiality of extensions and changes of the Internal Ratings Based Approach and the Advanced Measurement Approach (OJ L 148, 20.5.2014, p. 36).

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4.3   Additional quantitative elements

This section analyses the effect of a change in the absolute and relative components of the materiality threshold with respect to the criteria stated in the RTS, namely:

- the recognition of an excessive number of defaults that are due to other circumstances than financial difficulties of an obligor, and

- delays in the recognition of defaults that are due to financial difficulties of an obligor.

The recognition of defaults that are due to other circumstances than financial difficulties is considered via the cure rate, in line with the considerations outlined in Section 4.2.1.

The delay in default recognition is measured as the time in which the amount past due reaches a level that exceeds the threshold, in line with the considerations outlined in Section 4.2.2.

The results presented in this section are based on a data collection exercise carried out on a stratified sample of euro area banks in November 2017, encompassing 50 portfolios, 21 of which are retail and 29 non-retail. The relevant statistics on delays and cure rates were collected for different portfolios covering both retail and non-retail asset classes.

The delays in default recognition and the cure rates collected on the basis of current thresholds are compared with the same statistics simulated on the basis of thresholds foreseen by the RTS.

The following sections present the impact on these statistics stemming from a change in the levels of the absolute and relative components of the materiality threshold.

The aim of this section is to complement the qualitative arguments provided in Section 4.2. Conclusions on the most appropriate level of the materiality threshold cannot be drawn solely on the basis of the quantitative assessment summarised in this section because the data collection exercise was based on some simplifying assumptions[14] in the impact assessment methodology. These assumptions were intended to reduce the burden for the participating institutions, while also allowing meaningful information on the impact of the policy options to be obtained. Moreover, some data quality issues as well as issues on the representativeness of the sample for the whole euro area were revealed. These issues have been resolved insofar as possible, but limitations intrinsic to the exercise and methodological simplifications mean that the results of the quantitative assessment should only be seen as

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[14] The main assumption relates to the structure of the materiality threshold, which was kept unchanged when simulating the application of different levels of the absolute and relative components. This assumption was necessary to reduce the burden of the simulation, considering that the IT implementation of the new materiality threshold within institutions is still ongoing.

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indicative and considered solely in conjunction with the considerations set out in the qualitative analysis.

### 4.3.1 Change in the absolute component

The impact of a change in the absolute component of the materiality threshold to the cap values set out in the RTS, i.e. €100 for retail portfolios and €500 for non-retail portfolios, as calculated by the participating institutions, is depicted in **Chart 19** and **Chart 20**.

Chart 19 shows the cure rates in the portfolios for defaults triggered by the days past due (DPD) criterion and for defaults triggered by the UTP criterion. The cure rate stemming from the current implementation of the materiality threshold is reported on the horizontal axis, whereas the cure rate stemming from an absolute component of €100 for retail and of €500 for non-retail portfolios is given on the vertical axis.[15]

The chart shows that cure rates are not significantly affected by different levels of the absolute component of the materiality threshold.

Chart 19
Impact on cure rates stemming from changes in the absolute materiality threshold
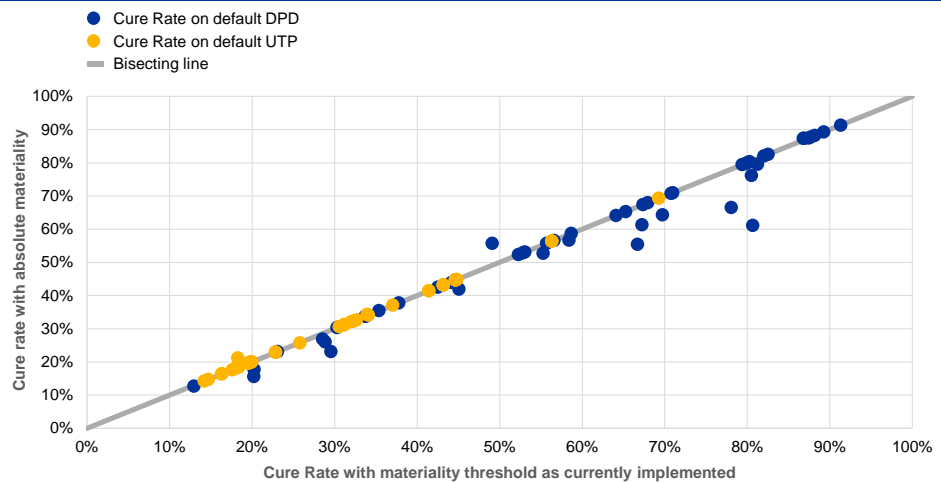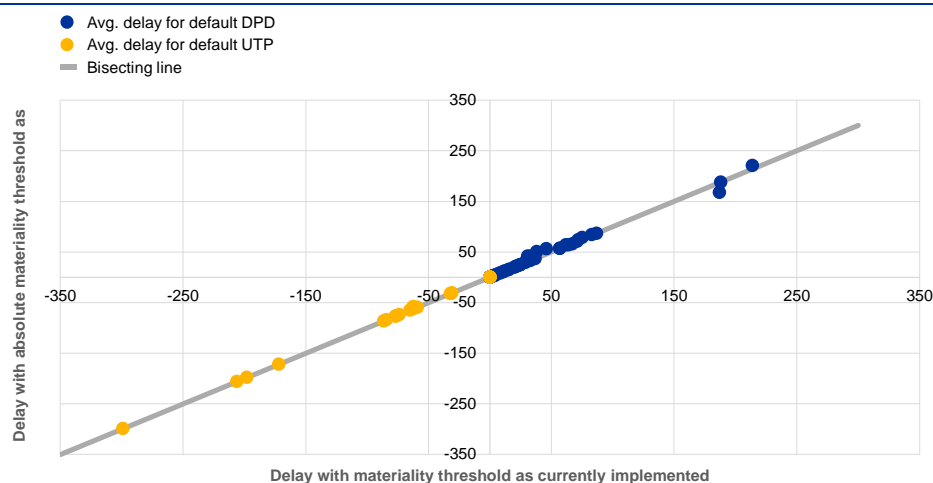

Source: ECB

Chart 20 compares the delays (in number of days) in the default recognition in all portfolios for defaults triggered by the DPD criterion and the UTP criterion. Delays arising from the current materiality threshold are plotted on the horizontal axis and those arising from the maximum threshold from the RTS (as calculated by the participating institutions) on the vertical axis. The negative values for the delays reported for defaults triggered by UTP criterion measure how many days in advance the default was triggered relative to when they would have been triggered by the past due criterion.

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15   This chart relates only to portfolios with more than 100 defaults triggered by the DPD criterion.

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Since all portfolios are allocated very close to the bisecting line, it can be concluded that setting the absolute component of the materiality threshold to €100 for retail portfolios and to €500 for non-retail portfolios does not imply a significant change in the delays in the default recognition.

Chart 20

Impact of changing the absolute level of the materiality threshold on the delays in the recognition of defaults

Source: ECB

The analysis outlined in this section leads one to conclude that defining the absolute component of the materiality threshold to €100 for retail portfolios and to €500 for non-retail portfolios does not bear an unreasonable level of risk with respect to either (i) identifying defaults not due to financial difficulties, or (ii) delaying the default recognition.

4.3.2   Change in the relative component

As part of the data collection exercise, several of the participating institutions voluntarily provided a simulation of the change of the relative component of the materiality threshold to 1% and to 2.5%. The resulting delays in the recognition of defaults and the cure rates for defaults triggered by the DPD criterion were determined in analogy to the analysis for the absolute threshold.

Chart 21 and **Chart 22** display the results. Each retail portfolio is depicted as a solid line and each non-retail portfolio as a dashed line. The horizontal axis shows the level of the relative component, whereas the vertical axis shows the cure rate (**Chart 21**) or the average delays in default recognition (**Chart 22**) for defaults triggered by the DPD criterion.

The cure rates, as depicted in **Chart 21**, remain roughly constant when the materiality threshold is changed from 1% to 2.5%. This analysis thus shows no evidence that a level of 1% for the relative component of the materiality threshold leads to the recognition of an excessive number of defaults that are not caused by

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financial difficulties of the obligor and supports the qualitative considerations outlined in Section 4.2.1.

Chart 21

Distribution of cure rates over scenarios with monthly payments

Legend: Solid lines – retail portfolios; dashed lines – non-retail portfolios.
The results for the relative threshold values of 1% and 2.5% were simulated by a subset of the participating institutions.
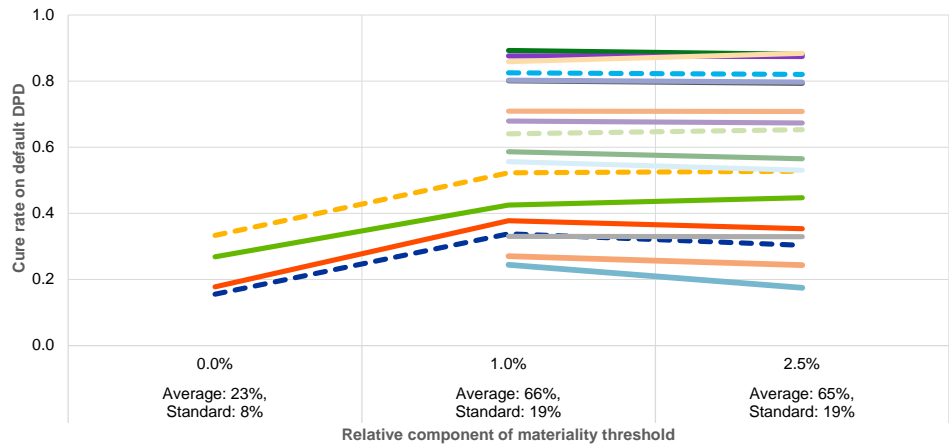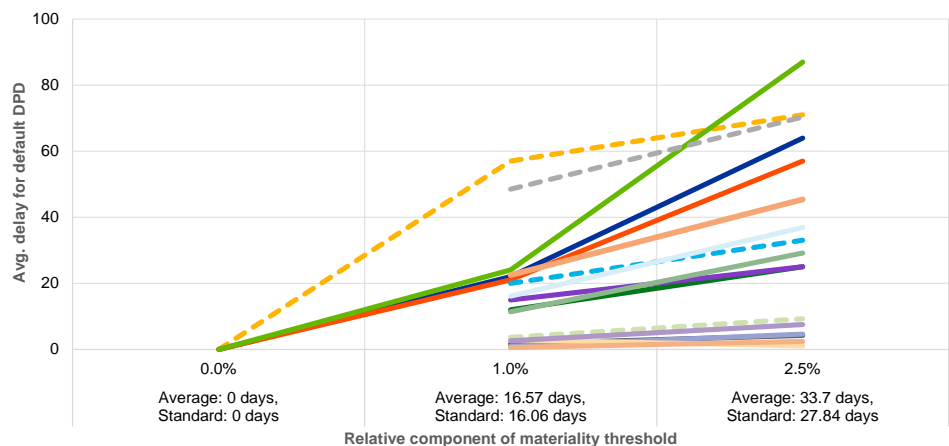

Source: ECB.

As shown in **Chart 22** the average delay in the recognition of defaults introduced by a materiality threshold set at 1% is about 14 days. This delay is low when compared to the 90 days required to trigger the default, as well as when compared to common monthly frequencies of repayments. Hence, there is no evidence that a level of 1% for the relative component of the materiality threshold leads to significant delays in the recognition of defaults that are due to financial difficulties of the obligor and supports the qualitative considerations outlined in Section 4.2.2.

Chart 22

Distribution of delays over scenarios with monthly payments

Legend: Solid lines – retail portfolios; dashed lines – non-retail portfolios.
The results for the relative threshold values of 1% and 2.5% were simulated by a subset of the participating institutions

Source: ECB.

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5 Conclusions

This document substantiates the analysis of costs and benefits related to the suitable policy options for the materiality threshold for credit obligations past due that the ECB is required to define under Article 178(2)(d) CRR, in compliance with the provisions of the RTS.

On the basis of the considerations and analyses described in this document, it is possible to draw conclusions and identify the most appropriate policy option for the level of the materiality threshold to be defined by the ECB.

Namely, on the basis of the conditions for the setting of the materiality threshold as set out in Article 3 of the RTS, it is deemed that:

- for the definition of the absolute component of the materiality threshold, the cap levels set out in the RTS, i.e. €100 for retail exposures and €500 for non-retail exposures, reflect a reasonable level of risk;

- for the definition of the relative component of the materiality threshold, the baseline level of 1% as suggested in the RTS reflects a reasonable level of risk.

For both the absolute and the relative component of the materiality threshold, the outcome of the cost and benefit analysis shows no evidence that these levels would lead to the recognition of an excessive number of defaults that are due to other circumstances than financial difficulties of an obligor or to significant delays in the recognition of defaults that are due to financial difficulties of an obligor.

As far as retail exposures are concerned, a separate single materiality threshold for institutions applying the definition of default at the level of an individual credit facility might not be justifiable. In fact, a materiality threshold at facility level higher than the materiality threshold at obligor level would not be conservative. Conversely, a materiality threshold at facility level lower than the materiality threshold at obligor level might generate unintended consequences. Therefore, it is deemed that for retail exposures where the definition of default is applied at facility level, the same materiality threshold identified for default detection at obligor level should apply.

In conclusion, the reasoning and the evidence outlined in this document currently support the choice of the cap levels for the absolute threshold as well as the baseline level for the relative threshold as proposed in the RTS. The adoption of these levels should help to advance the harmonisation of the threshold throughout the EU and to simplify processes for institutions, especially for those involved in cross-border activities.

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6   Annex

This Annex describes the analytical framework for the computation of P(T-1), D(T,K) and K* using different types of amortisation schedules.

Let r be the nominal annual interest rate for the loan, M its term in years and P its principal amount. Using $[x]$ to denote the first integer higher than x, then P(T-1), D(T,K) and K* can be computed as follows:

- for a constant payments amortisation schedule

$$P(T-1) = P \cdot \left(1 - \frac{\left(1+\frac{r}{F}\right)^{T-1} - 1}{\left(1+\frac{r}{F}\right)^{M \cdot F} - 1}\right)$$

$$D(T,K) = K \cdot P \cdot \left(\frac{\frac{r}{F} \cdot \left(1+\frac{r}{F}\right)^{M \cdot F}}{\left(1+\frac{r}{F}\right)^{M \cdot F} - 1}\right)$$

$$K^* = \left[H \cdot \left(1 - \frac{\left(1+\frac{r}{F}\right)^{T-1} - 1}{\left(1+\frac{r}{F}\right)^{M \cdot F} - 1}\right) \cdot \frac{\left(1+\frac{r}{F}\right)^{M \cdot F} - 1}{\frac{r}{F} \cdot \left(1+\frac{r}{F}\right)^{M \cdot F}} \right]$$

- for a linear amortisation schedule

$$P(T-1) = P \cdot \frac{M \cdot F - T + 1}{M \cdot F}$$

$$D(T,K) = \frac{K \cdot P}{M \cdot F} \cdot \left[\frac{r}{F} \cdot \left(M \cdot F - T - \frac{1+K}{2}\right) + 1\right]$$

$$K^* = \left[M \cdot F - T - \frac{1}{2} + \frac{F}{r} - \sqrt{\left(M \cdot F - T - \frac{1}{2} + \frac{F}{r}\right)^2 - \frac{2 \cdot H \cdot F \cdot (M \cdot F - T + 1)}{r}} \right]$$

- for a bullet loan

$$P(T-1) = P$$

$$D(T,K) = \frac{K \cdot P \cdot r}{F}$$

$$K^* = min\left(\left[\frac{H \cdot F}{r}\right], M \cdot F\right)$$

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