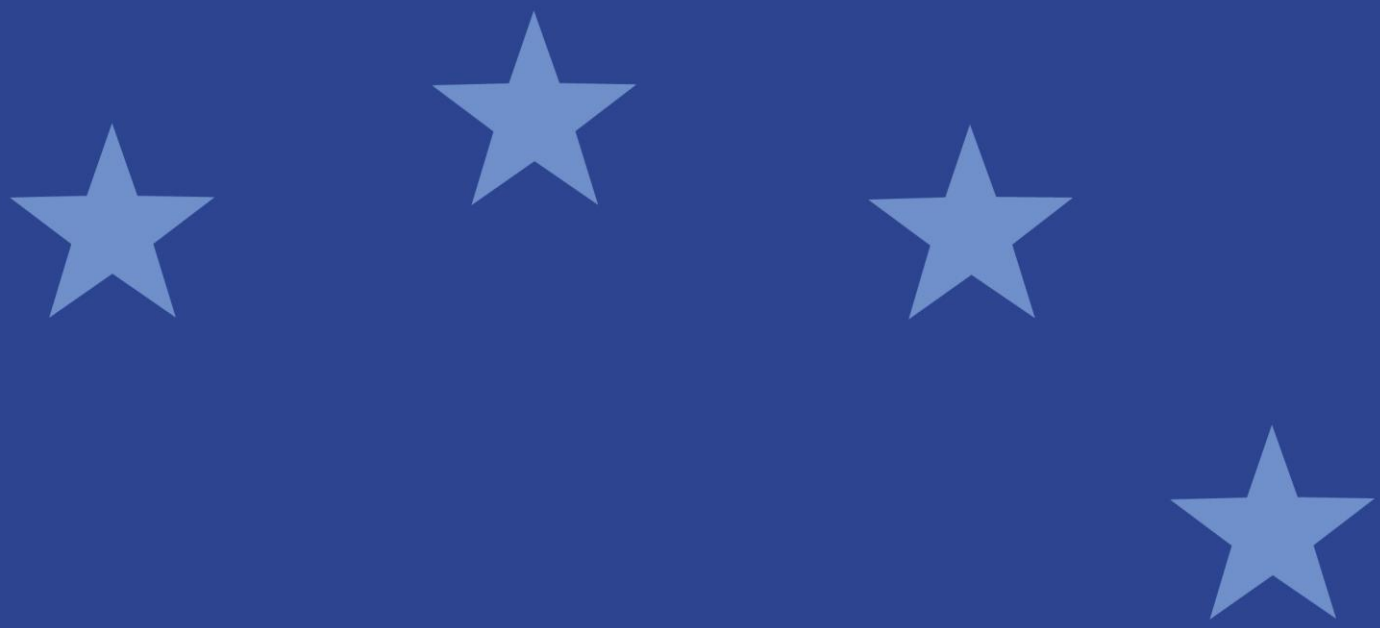
esma European Securities and Markets Authority

Guidelines

On stress test scenarios under the MMF Regulation



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1. Scope

Who?

1. These guidelines apply to competent authorities, money market funds and managers of money market funds as defined in the MMF Regulation[1].

What?

2. These guidelines apply in relation to Article 28 of the MMF Regulation and establish common reference parameters for the stress test scenarios to be included in the stress tests conducted by MMFs or managers of MMFs in accordance with that Article.

When?

3. These guidelines apply from two months after the date of publication of the guidelines on ESMA's website in all EU official languages (with respect to parts in red – the other parts of the Guidelines already apply from the dates specified in Articles 44 and 47 of the MMF Regulation).

[1] Regulation (EU) 2017/1131 of the European Parliament and of the Council of 14 June 2017 on money market funds (OJ L 169, 30.06.2017, p. 8).

2. Purpose

4. The purpose of these guidelines is to ensure common, uniform and consistent application of the provisions in Article 28 of the MMF Regulation. In particular, and as specified in Article 28(7) of the MMF Regulation, they establish common reference parameters of the stress test scenarios to be included in the stress tests taking into account the following factors specified in Article 28(1) of the MMF Regulation:

   a) hypothetical changes in the level of liquidity of the assets held in the portfolio of the MMF;

   b) hypothetical changes in the level of credit risk of the assets held in the portfolio of the MMF, including credit events and rating events;

   c) hypothetical movements of the interest rates and exchange rates;

   d) hypothetical levels of redemption;

   e) hypothetical widening or narrowing of spreads among indexes to which interest rates of portfolio securities are tied;

   f) hypothetical macro systemic shocks affecting the economy as a whole.

5. In accordance with Article 28(7) MMF Regulation, these guidelines will be updated at least every year taking into account the latest market developments. In 2019, the section 4.8 of these guidelines is in particular updated so that managers of MMFs have the information needed to fill in the corresponding fields in the reporting template referred to mentioned in Article 37 of the MMF Regulation, as specified by Commission Implementing Regulation (EU) 2018/708[2]. This information includes specifications on the types of the stress tests mentioned in this section 4.8 and their calibration.

3. Compliance and reporting obligations

3.1 Status of the guidelines

6. In accordance with Article 16(3) of the ESMA Regulation, competent authorities and financial market participants must make every effort to comply with these guidelines.

7. Competent authorities to which these guidelines apply should comply by incorporating them into their national legal and/or supervisory frameworks as appropriate, including where particular guidelines are directed primarily at financial market participants. In this case, competent authorities should ensure through their supervision that financial market participants comply with the guidelines.

3.2 Reporting requirements

8. Within two months of the date of publication of the guidelines on ESMA's website in all EU official languages, competent authorities to which these guidelines apply must notify ESMA whether they (i) comply, (ii) do not comply, but intend to comply, or (iii) do not comply and do not intend to comply with the guidelines.

9. In case of non-compliance, competent authorities must also notify ESMA within two months of the date of publication of the guidelines on ESMA's website in all EU official languages of their reasons for not complying with the guidelines.

10. A template for notifications is available on ESMA's website. Once the template has been filled in, it shall be transmitted to ESMA.

4. Guidelines on stress test scenarios under Article 28 of the MMF Regulation (Financial market participants are not required to report results of stress tests referred to in sections 4.1 to 4.7 below)

4.1 Guidelines on certain general features of the stress test scenarios of MMF

Scope of the effects on the MMF of the proposed stress test scenarios

11. Article 28(1) of the MMF Regulation requires MMFs to put in place "sound stress testing processes that identify possible events or future changes in economic conditions which could have unfavourable effects on the MMF".
12. This leaves room for interpretation on the exact meaning of the "effects on the MMF", such as:

- impact on the portfolio or net asset value of the MMF,
- impact on the minimum amount of liquid assets that mature daily or weekly as referred to in Article 24(c) to 24(h) and Article 25(c) to 25(e) of the MMF Regulation,
- impact on the ability of the manager of the MMF to meet investors' redemption requests,
- impact on the difference between the constant NAV per unit or share and the NAV per unit or share (as explicitly mentioned in Article 28(2) of the MMF Regulation in the case of CNAV and LVNAV MMFs),
- impact on the ability of the manager to comply with the different diversification rules as specified in Article 17 of the MMF Regulation.

13. The wording of Article 28(1) of the MMF Regulation should include various possible definitions. In particular, the stress test scenarios referred to in Article 28 of the MMF Regulation should test the impact of the various factors listed in Article 28(1) of the MMF Regulation on both i) the portfolio or net asset value of the MMF and ii) the liquidity bucket(s) of the MMF and/or the ability of the manager of the MMF to meet investors' redemption requests. This broad interpretation is in line with the stress-testing framework of the AIFMD, which includes both meanings in its Articles 15(3)(b) and 16(1). The specifications included in the following sections 4.2 to 4.7 therefore apply to stress test scenarios on both aspects mentioned above.

14. With respect to liquidity, it is to be noted that liquidity risk may result from: (i) significant redemptions; (ii) deterioration of the liquidity of assets; or (iii) a combination of the two.

Historical scenarios and hypothetical scenarios

15. With respect to both stress test scenarios on i) the portfolio or net asset value of the MMF and ii) the liquidity bucket(s) of the MMF and/or the ability of the manager of the MMF to meet investors' redemption requests, managers could use the factors specified in sections 4.2 to 4.7 using historical and hypothetical scenarios.

16. Historical scenarios reproduce the parameters of previous event or crises and extrapolate the impact they would have had on the present portfolio of the MMF.

17. While using historical scenarios, managers should vary the time windows in order to process several scenarios and avoid getting stress test results that depend overly on an arbitrary time window (e.g. one period with low interest rates and another with higher rates). By way of example, some commonly used scenarios refer to junk bonds in 2001, subprime mortgages in 2007, the Greek crisis in 2009 and the Chinese stock market crash in 2015. These scenarios may include independent or correlated shocks depending on the model.

18. Hypothetical scenarios are aimed at anticipating a specific event or crisis by setting its parameters and predicting its impact on the MMF. Examples of hypothetical scenarios include those based on economic and financial shocks, country or business risk (e.g. bankruptcy of a sovereign state or crash in an industrial sector). This type of scenario may require the creation of a dashboard of all changed risk factors, a correlation matrix and a choice of financial behaviour model. It also includes probabilistic scenarios based on implied volatility.

19. Such scenarios may be single-factor or multi-factor scenarios. Factors can be uncorrelated (fixed income, equity, counterparty, forex, volatility, correlation, etc.) or correlated: a particular shock may spread to all risk factors, depending on the correlation table used.

Aggregation of stress tests

20. In certain circumstances, in addition, managers could use aggregate stress test scenarios on a range of MMFs or even on all the MMFs managed by the manager.

Aggregating results would provide an overview and could show, for example, the total volume of assets held by all the MMFs of the manager in a particular position, and the potential impact of several portfolios selling out of that position at the same time during a liquidity crisis.

Reverse stress testing

21. In addition to the stress test scenarios discussed in this section, the inclusion of reverse stress testing may also be of benefit. The intention behind a reverse stress test is to subject the MMF to stress testing scenarios to the point of failure, including the point where the regulatory thresholds set up in the MMF Regulation, such as those included in its Article 37(3)(a) would be breached. This would allow the manager of a MMF to have another tool to explore any vulnerabilities, pre-empt, and resolve such risks.

Combination of the various factors mentioned in the following sections 4.2 to 4.7 with investors' redemption requests

22. All factors mentioned in the following sections 4.2 to 4.7 should be tested against several levels of redemption. This is not to say that at first, managers should not also test them separately (without combining them with tests against levels of redemption), in order to be able to identify the corresponding respective impacts. The way this combination of the various factors mentioned in the following sections 4.2 to 4.7 with investors' redemption requests could be carried out is further specified in each of these sections.

23. In that context, some hypothesis on the behaviour of the manager with regard to honouring the redemption requests could be required.

24. A practical example of one possible implementation is given in Appendix.

Stress tests in the case of CNAV and LVNAV MMFs

25. Article 28(2) of the MMF Regulation indicates that in addition to the stress test criteria as set out in Article 28(1), CNAV and LVNAV MMFs shall estimate for different scenarios, the difference between the constant NAV per unit or share and the NAV per unit or share. While estimating this difference, and if the manager of the MMF is of the view that this would be useful additional information, it may also be relevant to estimate

the impact of the relevant factors included in sections 4.2 to 4.7 on the volatility of the portfolio or on the volatility of the net asset value of the fund.

Non-exhaustiveness of the factors mentioned in the following sections 4.2 to 4.7

26. The factors set out in the following sections 4.2 to 4.7 are minimum requirements. The manager would be expected to tailor the approach to the specificities of its MMFs and add any factors or requirements that it would deem useful to the stress test exercise. Examples of other factors that could be taken into account include the repo rate considering MMFs are a significant player in that market.

27. More generally the manager should build a number of scenarios, with different levels of severity, which would combine all the relevant factors (which is to say that there should not just be separate stress tests for each factor – please also refer to the following sections 4.2 to 4.7).

4.2 Guidelines on stress test scenarios in relation to hypothetical changes in the level of liquidity of the assets held in the portfolio of the MMF

28. With respect to the level of changes of liquidity of the assets mentioned in Article 28(1)(a) of the MMF Regulation, managers could consider such parameters as:

- the gap between the bid and ask prices;
- the trading volumes;
- the maturity profile of assets;
- the number of counterparties active in the secondary market. This would reflect the fact that lack of liquidity of assets may result from secondary markets related issues, but may also be related to the maturity of the asset.

29. The manager could also consider a stress test scenario that would reflect an extreme event of liquidity shortfall due to dramatic redemptions, by combining the liquidity stress test with a bid - ask spread multiplied by a certain factor while assuming a certain redemption rate of the NAV

4.3 Guidelines on stress test scenarios in relation to hypothetical changes in the level of credit risk of the assets held in the portfolio of the MMF, including credit events and rating events

30. With respect to the levels of changes in credit risk of the asset mentioned in Article 28(1)(b), guidance on this factor should not be too prescriptive because the widening or narrowing of credit spreads is usually based on quickly evolving market conditions.

31. However, managers could, for example, consider:

- the downgrade or default of particular portfolio security positions, each representing relevant exposures in the MMF's portfolio;
- the default of the biggest position of the portfolio combined with a downgrade of the ratings of assets within the portfolio;
- parallels shifts of the credit spreads of a certain level for all assets held in the portfolio.

32. With respect to such stress tests involving the levels of changes of credit risk of the asset, it would also be relevant to consider the impact of such stress tests on the credit quality assessment of the corresponding asset in the context of the methodology described in Article 19 of the MMF Regulation.

33. The manager should, for the purpose of combining different factors, combine changes to the level of credit risk of the assets held in the portfolio of the MMF with given levels of redemptions. The manager could consider a stress test scenario that would reflect an extreme event of stress due to uncertainty about the solvency of market participants, which would lead to increased risk premia and a flight to quality. This stress test scenario would combine the default of a certain percentage of the portfolio with spreads going up together while assuming a certain redemption rate of the NAV.

34. The manager could also consider a stress test scenario that would combine a default of a certain percentage of the value of the portfolio with an increase in short term interest rates and a certain redemption rate of the NAV

4.4 Guidelines on stress test scenarios in relation to hypothetical movements of the interest rates and exchange rates

35. With respect to the levels of change of the interest rates and exchange rates mentioned in Article 28(1)(c) of the MMF Regulation, managers could consider stress testing of parallel shifts of a certain level. More specifically, managers could consider depending on the specific nature of their strategy:

i. an increase in the level of short term interest rates with 1-month and 3-month treasury rates going up simultaneously while assuming a certain redemption rate;

ii. a gradual increase in the long term interest rates for sovereign bonds;

iii. a parallel and/or non parallel shift in the interest rate curve that would change short, medium and long interest rate;

iv. movements of the FX rate (base currency vs other currencies).

36. The manager could also consider a stress test scenario that would reflect an extreme event of increased interest rates that would combine an increase in short-term interest rates with a certain redemption rate. The manager could also consider a matrix of interest rates / credit spreads.

4.5 Guidelines on stress test scenarios in relation to hypothetical levels of redemption

37. With respect to the levels of redemption mentioned in Article 28(1)(d) of the MMF Regulation, managers could consider redemption stress tests following from historical or hypothetical redemption levels or with the redemption being the maximum of either a certain percentage of the NAV or an opt-out redemption option exercised by the most important investors.

38. Stress tests on redemptions should include the specific measures which the MMF has the constitutional power to activate (for instance, gates and redemption notice).

39. The simulation of redemptions should be calibrated based on stability analysis of the liabilities (i.e. the capital), which itself depends on the type of investor (institutional, retail, private bank, etc.) and the concentration of the liabilities. The particular characteristics of the liabilities and any cyclical changes to redemptions would need to be taken into account when establishing redemption scenarios. However, there are

many ways to test liabilities and redemptions. Examples of significant redemption scenarios include i) redemptions of a percentage of the liabilities ii) redemptions equal to the largest redemptions ever seen iii) redemptions based on an investor behaviour model.

40. Redemptions of a percentage of the liabilities could be defined based on the frequency of calculating the net asset value, any redemption notice period and the type of investors.

41. It is to be noted that liquidating positions without distorting portfolio allocation requires a technique known as slicing, whereby the same percentage of each asset type (or each liquidity class if the assets are categorised according to their liquidity, also known as bucketing) is sold, rather than selling the most liquid assets first. The design and execution of the stress test should take into account and specify whether to apply a slicing approach or by contrast a waterfall approach (i.e. selling the most liquid assets first).

42. In the case of redemption of units by the largest investor(s), rather than defining an arbitrary redemption percentage as in the previous case, managers could use information about the investor base of the MMF to refine the stress test. Specifically, the scenario involving redemption of units by the largest investors should be calibrated based on the concentration of the fund's liabilities and the relationships between the manager and the principal investors of the MMF (and the extent to which investors' behaviour is deemed volatile).

43. Managers could also stress test scenarios involving redemptions equal to the largest redemptions ever seen in a group of similar (geographically or in terms of fund type) MMFs or across all the funds managed by the manager. However, the largest redemptions witnessed in the past are not necessarily a reliable indicator of the worst redemptions that may occur in the future.

44. A practical example of one possible implementation is given in Appendix.

4.6 Guidelines on stress test scenarios in relation to hypothetical widening or narrowing of spreads among indexes to which interest rates of portfolio securities are tied

45. With respect to the extent of a widening or narrowing of spreads among indexes to which interest rates of portfolio securities are tied as mentioned in Article 28(1)(e) of the MMF Regulation, managers could consider the widening of spreads in various sectors to which the portfolio of the MMF is exposed, in combination with various increase in shareholder redemptions. Managers could in particular consider a widening of spreads going up.

4.7 Guidelines on stress test scenarios in relation to hypothetical macro systemic shocks affecting the economy as a whole

46. With respect to the identification of macro-systemic shocks affecting the economy as a whole mentioned in Article 28(1)(f) of the MMF Regulation, guidance on this item should not be prescriptive because the choice of hypothetical macro systemic shocks will depend to a large extent on the latest developments in the market.

47. However, ESMA is of the view that managers could use an adverse scenario in relation to the GDP. Managers could also replicate macro systemic shocks that affected the economy as a whole in the past.

48. Examples of such global stress test scenarios that the manager could consider are provided in Appendix.

4.8 Guidelines on the establishment of additional common reference stress test scenarios (the results of which should be included in the reporting template mentioned in Article 37(4) of the MMF Regulation)

49. In addition to the stress tests managers of MMFs conduct taking into account sections 4.1 to 4.7 of these guidelines, managers of MMFs should conduct the following common reference stress test scenarios. the results of which should be included in the reporting template mentioned in Article 37(4) of the MMF Regulation.

4.8.1 Level of changes of liquidity

50. With respect to the level of changes of liquidity of the assets mentioned in Article 28(1)(a) of the MMF Regulation:

- Managers of MMFs should apply the discount factors specified in section 5 of the guidelines[3] to reflect the increase in liquidity premia due to deterioration of market liquidity conditions in a stress scenario.
- For each relevant transferable security, the discount factors should be applied to the price used for the valuation of the fund at the time of the reporting ($\mathbf{VPrice}$) in accordance with Article 29(3)(a), according to their type and maturity, to derive an adjusted price ($\mathbf{VPrice_{adj}}$):

$$\mathbf{VPrice_{adj}} = (\mathbf{1} - \mathbf{liquidity\ discount}) * \mathbf{VPrice}$$

- The impact of the liquidity discount should be evaluated for the following assets: Sovereign Bonds, Corporate Bonds, Commercial Papers, ABCPs and eligible securitisations.
- The manager of the MMF should estimate the impact of the potential losses by valuing the investment portfolio at the derived adjusted price, $\mathbf{VPrice_{adj}}$, to determine the stressed NAV and calculate the impact as a percentage of the reporting NAV:

$$\mathbf{Asset\ liquidity\ risk\ impact}\ (\%) = \frac{\mathbf{Reporting\ NAV} - \mathbf{Stressed\ NAV}}{\mathbf{Reporting\ NAV}}$$

Notes:
The following assets should be stressed:

- Sovereign bonds, with a break down at country level;
- Corporate bonds, distinguishing at least between investment grade and high yield instruments;
- Commercial Papers, ABCPs and eligible securitisations, using the corporate bond parameters.

The calibration is available in section 5 of the Guidelines.

[3] The discount factor is calibrated on bid-ask spreads.

4.8.2 Level of change of credit risk

51. With respect to the levels of change of credit risk of the assets held in the portfolio of the MMF, including credit events and rating events, in accordance with Article 28(1)(b) of the MMF Regulation:

1) Credit spread stress test

52. Managers of MMFs should measure the impact of an increase in credit spread, according to the following specifications:

- For each security, the increase in spread specified in section 5 of the guidelines should be applied.
- For each security, the corresponding change in spread should be translated into a haircut.
- The impact of the cumulated haircuts in percentage of reporting NAV should be calculated.

$$\textbf{Credit risk impact}\ (\%) = \frac{\textbf{Reporting NAV} - \textbf{Stressed NAV}}{\textbf{Reporting NAV}}$$

2) Concentration stress test

53. Managers of MMFs should also simulate the default of their two main exposures. The resulting impact on NAV should then be calculated, expressed as a percentage:

$$\textbf{Concentration risk impact}\ (\%) = \frac{\textbf{Reporting NAV} - \textbf{Stressed NAV}}{\textbf{Reporting NAV}}$$

Notes:
The concentration risk scenario depends on the characteristics of the exposure. The collateral (or any other mitigant, e.g. credit derivatives) received should be considered. If there is no collateral, or if the collateral is insufficient to cover the exposure, the following loss given default should apply:

- Senior exposures: 45 %;
- Subordinated exposures: 75 %.

The calibration is available in section 5 of the Guidelines.

4.8.3 Levels of change of the interest rates and exchange rates and levels of widening or narrowing of spreads among indices to which interest rates of portfolio securities are tied

54. With respect to the levels of change of the interest rates and exchange rates referred to in Article 28(1)(c) of the MMF Regulation, managers of MMFs should apply the following stressed market parameters using the parameters specified in section 5 of the guidelines in respect of (a) interest rate yield shocks which correspond to movements of the interest rates; and (b)FX shocks which corresponds to movements of the exchange rates.

1) Levels of change of the interest rates

55. With respect to the levels of change of the interest rates, managers of MMFs should use the same reference rate curve for all instruments denominated in a given currency and the reference rate tenor should align with the residual maturity of the instrument. For floating rate instruments, instruments may be contractually linked to a particular reference rate, in which case this rate is considered moving in parallel with the reference rate curve. If the table does not provide the tenor corresponding to the residual maturity of the instrument, managers of MMFs should use the most appropriate parameter in the table (e.g. the closest).

2) Levels of change of the exchange rates

56. With respect to the levels of change of the exchange rates, two scenarios should be used in the calculations: appreciation of the EUR against the USD; depreciation of the EUR against the USD.

3) Levels of widening or narrowing of spreads among indices to which interest rates of portfolio securities are tied

57. With respect to the levels of widening or narrowing of spreads among indices to which interest rates of portfolio securities are tied referred to in Article 28(1)(e) of the MMF Regulation, managers of MMFs should apply stressed market parameters, according to the following specifications:

- Managers of MMFs should use the parameters specified in section 5 of the guidelines.
- For instruments not tied to a specific index, managers of MMFs shall use the reference rate curve provided for the change of the interest rates scenario.
- If the table does not provide the tenor corresponding to the residual maturity of the instrument, managers of MMFs should use the most appropriate parameter in the table (e.g. the closest).

4) Results

58. Managers of MMFs should revaluate their portfolio considering the new parameters separately: interest rates, exchange rates, benchmark rates. They should express the impact of each risk factor as a percentage of NAV by calculating the following:

$$\textbf{Risk factor impact}\ (\%) = \frac{\textbf{Reporting NAV} - \textbf{Stressed NAV}}{\textbf{Reporting NAV}}$$

Notes:

The calibration is available in section 5 of the Guidelines.

4.8.4 Levels of redemption

59. With respect to the levels of redemption referred to in Article 28(1)(d) of the MMF Regulation, managers of MMFs should apply the following stressed redemption scenarios: a reverse liquidity stress test, a weekly liquidity stress test and a concentration stress test.

1) Reverse liquidity stress test

60. The reverse liquidity stress test comprises the following steps:

- For each asset, managers of MMFs should measure the weekly tradable amount (including maturing assets).
- Managers of MMFs should measure the maximum weekly tradable amount that can be liquidated with the portfolio allocation still being in line with all regulatory requirements of the MMF without distorting the portfolio allocation.

$$\textbf{Result}\ (\%) = \frac{\textbf{Maximum weekly tradable amount that can be liquidated without distorting the portfolio allocation}}{\textbf{NAV}}$$

Notes:

- For each asset, the weekly tradable amount shall be based on the manager's assessment of the fund's portfolio that is capable of being liquidated within one week. Such assignment should be based on the shortest period during which such a position could reasonably be liquidated at or near its carrying value[4].
- The maximum size of outflows the fund can face in one week without distorting the portfolio allocation is determined by (1) the sum of the weekly tradable amounts; and (2) the fund's capacity to comply with the regulatory requirements.
- For these purposes, the regulatory requirements are not limited to but should include at least:
  - Diversification (Article 17 of the MMF Regulation);
  - Concentration (Article 18 of the MMF Regulation);
  - Portfolio rules for short-term MMFs (Article 24 of the MMF Regulation) and for standard MMFs (Article 25 of the MMF Regulation), in particular,

[4] For its definition, see the Guidelines on reporting obligations under Articles 3(3)(d) and 24(1), (2) and (4) of the AIFMD

Maximum weighted average maturity (WAM); Maximum weighted average life (WAL), daily maturing assets; and weekly maturing assets.

- For example, if 50% of a LVNAV MMF assets are tradable within a week but its WAM becomes higher than 60 days after selling 30%, the manager should report 30%.

The calibration is available in section 5 of the Guidelines.

2) Weekly liquidity stress test:

61. The weekly liquidity stress test assesses the fund's capacity to meet outflows with available weekly liquid assets, considered as the sum of highly liquid assets and weekly maturing assets and comprises the following steps:

- managers of MMFs should apply a stressed redemption scenario where the fund receives net weekly redemption requests from 25% of the professional investors and 15% of the retail investors.
- managers of MMFs should measure available weekly liquid assets to meet the redemption requests according to the following table:

Assets	Article	CQS
Assets referred to in Article 17(7)[5] of the MMF Regulation which are highly liquid and can be redeemed and settled within one working day and have a residual maturity of up to 190 days.	24 (e)	1
Cash which is able to be withdrawn by giving prior notice of five working days without penalty.	24 (e) 25 (d)	
Weekly maturing assets	24 (e) 25 (d)	
Reverse repurchase agreements which are able to be terminated by giving prior notice of five working days	24 (e) 25 (d)	
x100% = Weekly liquid assets (bucket 1)		
Assets referred to in Article 17(7) of the MMF Regulation which can be redeemed and settled within one working week.	17(7)	1,2
Money market instruments or units or shares of other MMFs which they are able to be redeemed and settled within five working days.	24 (e) 25 (e)	1,2
Eligible securitisations and asset-backed commercial paper (ABCPs).	9(1)(b)	1
x85% = Weekly liquid assets (bucket 2)		

[5] Money market instruments issued or guaranteed separately or jointly by the Union, the national, regional and local administrations of the Member States or their central banks, the European Central Bank, the European Investment Bank, the European Investment Fund, the European Stability Mechanism, the European Financial Stability Facility, a central authority or central bank of a third country, the International Monetary Fund, the International Bank for Reconstruction and Development, the Council of Europe Development Bank, the European Bank for Reconstruction and Development, the Bank for International Settlements, or any other relevant international financial institution or organisation to which one or more Member States belong.

- Managers of MMFs should calculate the coverage of outflows by weekly liquid assets as a percentage in the following way:

$$\textbf{Result}\ (\%) = \frac{\textbf{Weekly liquid assets}}{\textbf{Weekly outflows}}$$

Notes:

- Weekly liquid assets are classified in two buckets (bucket 1 and 2) according to their category and credit quality. CQS refers to "Credit Quality Steps", within the meaning of the COMMISSION IMPLEMENTING REGULATION (EU) 2016/1799[6].

- The sum of the weighted weekly liquid assets will be expressed in percentage of the redemption shock. For example, if a fund meets a redemption shock of 30% with 20% of bucket 1 liquid assets and 45% of total weekly liquid assets (buckets 1 and 2), the manager should report the ratio (Weekly liquid assets)/(Weekly outflows) as a result:

  - 20%/30% = 67% (bucket 1); and

  - 45%/30% = 150% (bucket 1 and 2).

- It is important to note that the liquidity of any asset classes should always be checked in an appropriate manner. If there is any doubt regarding the liquidity of a security, managers of MMFs should not include it in the weekly liquid assets.

The calibration is available in section 5 of the Guidelines.

3) Concentration stress test

62. The concentration stress test is a scenario where the MMF faces redemption requests from its two main investors. The impact of the stress test should be assessed according to weekly liquidity stress test methodology.

$$\textbf{Result}\ (\%) = \frac{\textbf{Weekly liquid assets}}{\textbf{Invested amount of the two main investors}}$$

Note:
The calibration is available in section 5 of the Guidelines.

[6] https://eur-lex.europa.eu/legal-content/EN/TXT/?toc=OJ%3AL%3A2016%3A275%3ATOC&uri=uriserv%3AOJ.L_.2016.275.01.0003.01.ENG

4.8.5 Macro-systemic shocks affecting the economy as a whole

63. With respect to the identification of macro-systemic shocks affecting the economy as a whole referred to in Article 28(1)(f) of the MMF Regulation, managers of MMFs should take the following steps:

- measure the impact of a market shock combining different risk parameters in accordance with the table below;
- assess the impact of a redemption shock following the market shock. Assets sold in response to the redemption shock will result in additional losses, as defined in the liquidity stress test;
- calculate the result as a percentage of NAV;
- calculate the value of weekly liquid assets after market shock as a percentage of outflows. ;

	Risk factors	**Parameters used for the calibration**
Market shock	• FX Rate	• EUR/USD etc.
	• Interest Rate • Credit • Spread among indices to which interest rates of portfolio securities are tied	• Swap rate • Gov. bond yields/ spreads • Corp. bond yields/ spreads
Redemption shock	• Level of Redemption • Asset liquidity	• % outflows • Bid/ask spread (discount factor)
Results	• % NAV • Weekly liquid assets/ outflows	
Memo	• % outflows	

Notes:

The scenario envisages the following circumstances:

- The MMF is affected by a shock combining an adverse FX shock and an increase in interest rates including swap rate, government bond yields and corporate bond yields. The credit risk is included in the yield shock. Managers of MMFs should

use their internal models to measure the combined impact. The calibration of the shock is based on a macro scenario provided by ESMA and the ESRB and combining shocks from the other scenarios.

- In the wake of the market shock, investors ask for redemption. Outflows are calculated similarly to the redemption scenario by differentiating professional and retail investors, i.e. 15% from retail investors and 25% from professional investors.
- To meet the redemption requests, the fund sells assets in a stressed environment characterized by a widening of bid-ask spread as characterized in the liquidity stress test. For the purposes of the stress test, the loss is entirely borne by remaining investors (and not by redeeming investors).
- The impact on the NAV is the result of the market shock, the outflows and the liquidity shock.
- The impact on liquidity is calculated using the weekly liquidity stress test methodology.

The calibration is available in section 5 of the Guidelines.

5. Calibration for 2019

64. The following section includes the 2019 calibration for the MMF stress tests the results of which have to be reported in accordance with Article 37 of the MMF Regulation, and which are detailed in section 4.8 above.

65. If managers need a parameter that is not indicated in this section, they may consult the adverse scenario on the ESRB website[7].

[7] https://www.esrb.europa.eu/mppa/stress/shared/pdf/esrb.stress_test190402_EIOPA_insurance~c5c17193da.en.pdf?172d96eff093ab8ed90c18efd3cf979f

5.1. Common reference parameters of the stress test scenarios in relation to hypothetical changes in the level of liquidity of the assets held in the portfolio of the MMF

Scope of the scenario

MMFR Eligible assets	Typical assets	Liquidity	
		Stressed	Parameters
(a) money market instruments	-Certificate of deposit (CD)	Yes	Table 3
	-Commercial Paper (CP)	Yes	Table 3
	-Government bonds, treasury and local authority bills	Yes	Table 1,2
	-Corporate bonds	Yes	Table 3
(b) eligible securitisations and asset-backed commercial paper (ABCPs)	-Eligible securitisations	Yes	Table 3
	-ABCPs	Yes	Table 3
(c) deposits with credit institutions	-Deposits, of which time deposits	No	
(d) financial derivative instruments	-Financial derivative instruments dealt in on a regulated market	No	
	-Financial derivative instruments dealt OTC	No	
(e) repurchase agreements	-Repos	No	
(f) reverse repurchase agreements	-Reverse repos	No	
(g) units or shares of other MMFs	-Shares issued by other MMFs	Yes	Extrapolation of the results to shares issued by other MMFs

Table 1

Liquidity discount factor - Sovereign bonds by residual maturity - Reference countries (in %)					
	3M	**6M**	**1Y**	**1.5Y**	**2Y**
DE	0.06	0.14	0.20	0.20	0.20
ES	0.23	0.44	0.70	0.72	0.75
FR	0.05	0.10	0.19	0.24	0.30
IT	0.47	0.62	0.63	0.64	0.65
NL	0.04	0.04	0.15	0.18	0.20

Table 2

Liquidity discount factor - Sovereign bonds by rating and residual maturity (in %)					
	3M	**6M**	**1Y**	**1.5Y**	**2Y**
AAA	0.05	0.09	0.18	0.19	0.20
AA	0.07	0.18	0.32	0.42	0.53
A	0.13	0.25	0.70	0.72	0.75
BBB	0.47	0.55	0.70	0.72	0.75
Below BBB or unrated	0.61	0.72	0.82	0.94	0.98

Table 3

Liquidity discount factor - Corporate bonds by rating and residual maturity (in %)					
	3M	**6M**	**1Y**	**1.5Y**	**2Y**
AAA	0.15	0.28	0.56	0.60	0.64
AA	0.23	0.56	1.02	1.35	1.69
A	0.43	0.79	2.24	2.32	2.40
BBB	1.50	1.77	2.24	2.32	2.40
Below BBB or unrated	1.96	2.30	2.91	2.95	2.99

5.2. Common reference parameters of the stress test scenarios in relation to hypothetical changes in the level of credit risk of the assets held in the portfolio of the MMF, including credit events and rating events

Scope of the scenario

MMFR Eligible assets	Typical assets	Credit (credit spreads)		Credit (2 main counterparties)	
		Stressed	Parameters	Stressed	Parameters
(a) money market instruments	-Certificate of deposit (CD)	Yes	Table 5	Yes	Table 6
	-Commercial Paper (CP)	Yes	Table 5	Yes	Table 6
	-Government bonds, treasury and local authority bills	Yes	Table 4	Yes	Table 6
	-Corporate bonds	Yes	Table 5	Yes	Table 6
(b) eligible securitisations and asset-backed commercial paper (ABCPs)	-Eligible securitisations	Yes	Table 5	Yes	Table 6
	-ABCPs	Yes	Table 5	Yes	Table 6
(c) deposits with credit institutions	-Deposits, of which time deposits	No		No	
(d) financial derivative instruments	-Financial derivative instruments dealt in on a regulated market	No		No	
	-Financial derivative instruments dealt OTC	No		No	
(e) repurchase agreements	-Repos	No		No	
(f) reverse repurchase agreements	-Reverse repos	No		No	
(g) units or shares of other MMFs	-Shares issued by other MMFs	Yes	Extrapolation of the results to shares issued by other MMFs	Yes	Extrapolation of the results to shares issued by other MMFs

Table 4: Shocks to government bond credit spreads

Credit Spread by residual maturity - Government bonds (basis points)					
Geographic Area	**Country**	**3M**	**6M**	**1Y**	**2Y**
EU	**Austria**	12	13	16	20
EU	**Belgium**	11	12	14	22
EU	**Croatia**	3	3	3	4
EU	**Cyprus**	49	55	71	71
EU	**Czech Republic**	85	95	125	125
EU	**Denmark**	12	13	16	17
EU	**Finland**	8	8	9	13
EU	**France**	13	14	17	23
EU	**Germany**	5	5	5	5
EU	**Greece**	67	75	98	114
EU	**Hungary**	69	77	101	121
EU	**Ireland**	56	62	81	84
EU	**Italy**	58	65	85	102
EU	**Latvia**	3	3	3	19
EU	**Lithuania**	9	9	11	24
EU	**Malta**	24	26	33	41
EU	**Netherlands**	9	10	12	15
EU	**Poland**	85	95	125	125
EU	**Portugal**	23	25	31	66
EU	**Romania**	23	26	32	48
EU	**Slovakia**	21	23	30	34
EU	**Slovenia**	35	39	50	58
EU	**Spain**	65	73	95	113
EU	**Sweden**	42	46	60	60
EU	**United Kingdom**	38	42	54	79
EA (weighted averages)	**EA (weighted averages)**	25	27	35	42
EU (weighted averages)	**EU (weighted averages)**	30	33	42	44
EEA	**EEA (including Switzerland)**	30	33	42	44
US	**United States**	44	48	61	75
JP	**Japan**	85	95	127	141
Other advanced economies	**Other advanced economies**	42	52	77	78
Emerging markets	**Emerging markets**	50	85	161	161

Table 5: Shocks to corporate bond and ABS credit spreads (all maturities)

Rating	Corporate credit spreads (basis points)			
	Non-financial	Financial covered	Financial	ABS
AAA	39	44	57	76
AA	40	52	63	96
A	41	113	124	116
BBB	66	163	180	160
BB	78	188	204	208
B	91	213	234	238
Below B or unrated	103	237	269	270

Table 6: Loss given default

Loss given default (%)	
Senior exposure	45
Subordinated exposure	75

5.3. Common reference parameters of the stress test scenarios in relation to hypothetical movements of the interest rates

Scope of the scenario

MMFR Eligible assets	Typical assets	IR (Interest rate swap)	
		Stressed	**Parameters**
(a) money market instruments	-Certificate of deposit (CD)	Yes	Table 6, 7
	-Commercial Paper (CP)	Yes	Table 6, 7
	-Government bonds, treasury and local authority bills	Yes	Table 6, 7
	-Corporate bonds	Yes	Table 6, 7
(b) eligible securitisations and asset-backed commercial paper (ABCPs)	-Eligible securitisations	Yes	Table 6, 7
	-ABCPs	Yes	Table 6, 7
(c) deposits with credit institutions	-Deposits, of which time deposits	Yes	Table 6, 7
(d) financial derivative instruments	-Financial derivative instruments dealt in on a regulated market	Yes	Table 6, 7
	-Financial derivative instruments dealt OTC	Yes	Table 6, 7
(e) repurchase agreements	-Repos	No	
(f) reverse repurchase agreements	-Reverse repos	Yes	Table 6, 7
(g) units or shares of other MMFs	-Shares issued by other MMFs	Yes	Extrapolation of the results to shares issued by other MMFs

Table 6: Shocks to swap rates

Interest rate yield shocks absolute changes (basis points)							
Geographic Area	**Country**	**Description**	**1M**	**3M**	**6M**	**1Y**	**2Y**
EU	**Euro Area**	Interest rate SWAP on the EUR (Euro)	53	53	60	80	71
EU	**Croatia**	Interest rate SWAP on the HRK (Croatian Kuna)	53	53	60	80	71
EU	**Czech Republic**	Interest rate SWAP on the CZK (Czech Koruna)	-4	-4	-4	-5	3
EU	**Denmark**	Interest rate SWAP on the DKK (Danish Krone)	53	53	60	80	71
EU	**Hungary**	Interest rate SWAP on the HUF (Hungarian Forint)	74	74	83	111	119
EU	**Poland**	Interest rate SWAP on the PLN (Polish Zloty)	25	25	28	37	53
EU	**Romania**	Interest rate SWAP on the RON (Romanian Leu)	153	153	172	229	217
EU	**Sweden**	Interest rate SWAP on the SEK (Swedish Krona)	26	26	30	40	55
EU	**United Kingdom**	Interest rate SWAP on the GBP (British Pound)	98	98	110	146	130
Rest of Europe	**Norway**	Interest rate SWAP on the NOK (Norwegian Krone)	20	20	22	30	39
Rest of Europe	**Russia**	Interest rate SWAP on the RUB (Russian Ruble)	122	122	137	183	184
Rest of Europe	**Switzerland**	Interest rate SWAP on the CHF (Swiss Franc)	31	31	35	46	54

Rest of Europe	**Turkey**	Interest rate SWAP on the TRY (Turkish Lira)	197	197	221	295	307
North America	**Canada**	Interest rate SWAP on the CAD (Canadian Dollar)	46	46	51	68	70
North America	**US**	Interest rate SWAP on the USD (US Dollar)	93	93	105	140	125
Australia and Pacific	**Australia**	Interest rate SWAP on the AUD (Australian Dollar)	33	33	37	50	62
South and central America	**Chile**	Interest rate SWAP on the CLP (Chilean Peso)	206	206	232	309	376
South and central America	**Colombia**	Interest rate SWAP on the COP (Colombian Peso)	162	162	183	243	276
South and central America	**Mexico**	Interest rate SWAP on the MXN (Mexican Peso)	245	245	276	368	360
Asia	**China**	Interest rate SWAP on the CNY (Chinese Yuan)	13	13	14	19	17
Asia	**Hong Kong**	Interest rate SWAP on the HKD (Hong Kong Dollar)	208	208	235	313	320
Asia	**India**	Interest rate SWAP on the INR (Indian Rupee)	263	263	296	395	394
Asia	**Japan**	Interest rate SWAP on the JPY (Japanese Yen)	9	9	10	14	19
Asia	**Korea**	Interest rate SWAP on the KRW (South Korean Won)	134	134	150	200	209
Asia	**Malaysia**	Interest rate SWAP on the MYR (Malaysian Ringgit)	90	90	101	134	153
Asia	**Singapore**	Interest rate SWAP on the SGD (Singapore Dollar)	116	116	130	173	176
Asia	**Thailand**	Interest rate SWAP on the THB (Thai Baht)	164	164	184	245	257
Africa	**South Africa**	Interest rate SWAP on the ZAR (South African Rand)	10	10	11	14	25

Table 7 Shocks to swap rates (default values for countries not included in table 6)

Interest rate yield shocks absolute changes (basis points)						
Geographic Area	**Description**	**1M**	**3M**	**6M**	**1Y**	**2Y**
EU	Default value for countries not included in table 6	59	59	66	89	88
Other advanced economies	Default value for countries not included in table 6	39	39	44	59	66
Other emerging markets	Default value for countries not included in table 6	231	231	260	346	363

5.4. Common reference parameters of the stress test scenarios in relation to hypothetical movements of the exchange rates

Scope of the scenario

MMFR Eligible assets	Typical assets	FX (Appreciation of the EUR)		FX (Depreciation of the EUR)	
		Stressed	Parameters	Stressed	Parameters
(a) money market instruments	-Certificate of deposit (CD)	Yes	Table 8	Yes	Table 9
	-Commercial Paper (CP)	Yes	Table 8	Yes	Table 9
	-Government bonds, treasury and local authority bills	Yes	Table 8	Yes	Table 9
	-Corporate bonds	Yes	Table 8	Yes	Table 9
(b) eligible securitisations and asset-backed commercial paper (ABCPs)	-Eligible securitisations	Yes	Table 8	Yes	Table 9
	-ABCPs	Yes	Table 8	Yes	Table 9
(c) deposits with credit institutions	-Deposits, of which time deposits	Yes	Table 8	Yes	Table 9
(d) financial derivative instruments	-Financial derivative instruments dealt in on a regulated market	Yes	Table 8	Yes	Table 9
	-Financial derivative instruments dealt OTC	Yes	Table 8	Yes	Table 9
(e) repurchase agreements	-Repos	No		No	
(f) reverse repurchase agreements	-Reverse repos	Yes	Table 8	Yes	Table 9
(g) units or shares of other MMFs	-Shares issued by other MMFs	Yes	Extrapolation of the results to shares issued by other MMFs	Yes	Extrapolation of the results to shares issued by other MMFs

Table 8

FX shocks (appreciation of the EUR against the USD) relative changes (%)			
Geographic Area	**Description**	**Exchange rate name**	**Shock**
EU	USDBGN represents 1 USD per x BGN (Bulgarian Lev)	**USDBGN**	-25.4
EU	EURCZK represents 1 EUR per x CZK (Czech Koruna)	**EURCZK**	-2.2
EU	EURGBP represents 1 EUR per x GBP (British Pound)	**EURGBP**	11.1
EU	EURHRK represents 1 EUR per x HRK (Croatian Kune)	**EURHRK**	0.1
EU	EURHUF represents 1 EUR per x HUF (Hungarian Forints)	**EURHUF**	-5.2
EU	USDNOK represents 1 USD per x NOK (Norwegian Krone)	**USDNOK**	-23.2
EU	EURPLN represents 1 EUR per x PLN (Polish Zloty)	**EURPLN**	-1.5
EU	EURRON represents 1 EUR per x RON (Romanian Leu)	**EURRON**	0.0
EU	EURRSD represents 1 EUR per x RSD (Serbian Dinar)	**EURRSD**	-1.9
EU	USDSEK represents 1 USD per x SEK (Swedish Krona)	**USDSEK**	-25.4
Rest of Europe	EURCHF represents 1 EUR per x CHF (Swiss Franc)	**EURCHF**	3.7
Rest of Europe	EURRUB represents 1 EUR per x RUB (Russian Ruble)	**EURRUB**	10.1
Rest of Europe	EURTRY represents 1 EUR per x TRY (Turkish Lira)	**EURTRY**	13.5
North America	USDCAD represents 1 USD per x CAD (Canadian dollar)	**USDCAD**	-13.0
North America	EURUSD represents 1 EUR per x USD (US Dollar)	**EURUSD**	25.4
Australia and Pacific	AUDUSD represents 1 AUD per x USD (Australian Dollar)	**AUDUSD**	17.5
Australia and Pacific	NZDUSD represents 1 NZD per x USD (New Zealand Dollar)	**NZDUSD**	18.0
South and central America	USDARS represents 1 USD per x ARS (Argentine Peso)	**USDARS**	-0.8
South and central America	USDBRL represents 1 USD per x BRL (Brazilian Real)	**USDBRL**	-12.2
South and central America	USDMXN represents 1 USD per x MXN (Mexican Peso)	**USDMXN**	-7.9
Asia	USDCNY represents 1 USD per x CNY (Chinese Yuan Renminbi)	**USDCNY**	-0.7
Asia	USDHKD represents 1 USD per x HKD (Hong Kong Dollar)	**USDHKD**	-0.1
Asia	USDINR represents 1 USD per x INR (Indian Rupee)	**USDINR**	-2.5
Asia	USDJPY represents 1 USD per x JPY (Japanese Yen)	**USDJPY**	-8.7
Asia	USDKRW represents 1 USD per x KRW (South Korean Won)	**USDKRW**	-2.1
Asia	USDMYR represents 1 USD per x MYR (Malaysian Ringgit)	**USDMYR**	-2.3
Asia	USDSGD represents 1 USD per x SGD (Singapore Dollar)	**USDSGD**	-10.4
Asia	USDTHB represents 1 USD per x THB (Thai Baht)	**USDTHB**	-2.3
Africa	USDZAR represents 1 USD per x ZAR (South African Rand)	**USDZAR**	-14.0

Table 9

FX shocks (depreciation of the EUR against the USD) relative changes (%)			
Geographic Area	**Description**	**Exchange rate name**	**Shock**
EU	USDBGN represents 1 USD per x BGN (Bulgarian Lev)	**USDBGN**	17.0
EU	EURCZK represents 1 EUR per x CZK (Czech Koruna)	**EURCZK**	2.4
EU	EURGBP represents 1 EUR per x GBP (British Pound)	**EURGBP**	-6.5
EU	EURHRK represents 1 EUR per x HRK (Croatian Kune)	**EURHRK**	-0.4
EU	EURHUF represents 1 EUR per x HUF (Hungarian Forints)	**EURHUF**	4.0
EU	USDNOK represents 1 USD per x NOK (Norwegian Krone)	**USDNOK**	17.7
EU	EURPLN represents 1 EUR per x PLN (Polish Zloty)	**EURPLN**	3.6
EU	EURRON represents 1 EUR per x RON (Romanian Leu)	**EURRON**	0.8
EU	EURRSD represents 1 EUR per x RSD (Serbian Dinar)	**EURRSD**	-1.5
EU	USDSEK represents 1 USD per x SEK (Swedish Krona)	**USDSEK**	18.4
Rest of Europe	EURCHF represents 1 EUR per x CHF (Swiss Franc)	**EURCHF**	-3.6
Rest of Europe	EURRUB represents 1 EUR per x RUB (Russian Ruble)	**EURRUB**	-9.6
Rest of Europe	EURTRY represents 1 EUR per x TRY (Turkish Lira)	**EURTRY**	-5.5
North America	USDCAD represents 1 USD per x CAD (Canadian dollar)	**USDCAD**	8.9
North America	EURUSD represents 1 EUR per x USD (US Dollar)	**EURUSD**	-17.0
Australia and Pacific	AUDUSD represents 1 AUD per x USD (Australian Dollar)	**AUDUSD**	-13.3
Australia and Pacific	NZDUSD represents 1 NZD per x USD (New Zealand Dollar)	**NZDUSD**	-13.6
South and central America	USDARS represents 1 USD per x ARS (Argentine Peso)	**USDARS**	1.3
South and central America	USDBRL represents 1 USD per x BRL (Brazilian Real)	**USDBRL**	9.1
South and central America	USDMXN represents 1 USD per x MXN (Mexican Peso)	**USDMXN**	7.1
Asia	USDCNY represents 1 USD per x CNY (Chinese Yuan Renminbi)	**USDCNY**	0.4
Asia	USDHKD represents 1 USD per x HKD (Hong Kong Dollar)	**USDHKD**	0.1
Asia	USDINR represents 1 USD per x INR (Indian Rupee)	**USDINR**	2.3
Asia	USDJPY represents 1 USD per x JPY (Japanese Yen)	**USDJPY**	4.5
Asia	USDKRW represents 1 USD per x KRW (South Korean Won)	**USDKRW**	3.0
Asia	USDMYR represents 1 USD per x MYR (Malaysian Ringgit)	**USDMYR**	1.5
Asia	USDSGD represents 1 USD per x SGD (Singapore Dollar)	**USDSGD**	6.1
Asia	USDTHB represents 1 USD per x THB (Thai Baht)	**USDTHB**	1.6
Africa	USDZAR represents 1 USD per x ZAR (South African Rand)	**USDZAR**	14.4

5.5. Common reference parameters of the stress test scenarios in relation to hypothetical widening or narrowing of spreads among indexes to which interest rates of portfolio securities are tied

Scope of the scenario

MMFR Eligible assets	Typical assets	IR (Interest rate swap)	
		Stressed	Parameters
(a) money market instruments	-Certificate of deposit (CD)	Yes	Table 6, 7
	-Commercial Paper (CP)	Yes	Table 6, 7
	-Government bonds, treasury and local authority bills	Yes	Table 6, 7
	-Corporate bonds	Yes	Table 6, 7
(b) eligible securitisations and asset-backed commercial paper (ABCPs)	-Eligible securitisations	Yes	Table 6, 7
	-ABCPs	Yes	Table 6, 7
(c) deposits with credit institutions	-Deposits, of which time deposits	Yes	Table 6, 7
(d) financial derivative instruments	-Financial derivative instruments dealt in on a regulated market	Yes	Table 6, 7
	-Financial derivative instruments dealt OTC	Yes	Table 6, 7
(e) repurchase agreements	-Repos	No	
(f) reverse repurchase agreements	-Reverse repos	Yes	Table 6, 7
(g) units or shares of other MMFs	-Shares issued by other MMFs	Yes	Extrapolation of the results to shares issued by other MMFs

5.6. Common reference parameters of the stress test scenarios in relation to hypothetical levels of redemption

Scope of the scenario

MMFR Eligible assets	Typical assets	Redemption (reverse liquidity ST)		Redemption (weekly liquidity ST		Redemption (2 main investors)	
		Stressed	Parameters	Stressed	Parameters	Stressed	Parameters
(a) money market instruments	-Certificate of deposit (CD)	Yes	Self-assessment	Yes	Table 10, 11	Yes	Table 10
	-Commercial Paper (CP)	Yes	Self-assessment	Yes	Table 10, 11	Yes	Table 10
	-Government bonds, treasury and local authority bills	Yes	Self-assessment	Yes	Table 10, 11	Yes	Table 10
	-Corporate bonds	Yes	Self-assessment	Yes	Table 10, 11	Yes	Table 10
(b) eligible securitisations and asset-backed commercial paper (ABCPs)	-Eligible securitisations	Yes	Self-assessment	Yes	Table 10, 11	Yes	Table 10
	-ABCPs	Yes	Self-assessment	Yes	Table 10, 11	Yes	Table 10
(c) deposits with credit institutions	-Deposits, of which time deposits	Yes	Self-assessment	Yes	Table 10, 11	Yes	Table 10
(d) financial derivative instruments	-Financial derivative instruments dealt in on a regulated market	Yes	Self-assessment	Yes	Table 10, 11	Yes	Table 10
	-Financial derivative instruments dealt OTC	Yes	Self-assessment	Yes	Table 10, 11	Yes	Table 10
(e) repurchase agreements	-Repos	Yes	Self-assessment	No	Table 10, 11	No	Table 10
(f) reverse repurchase agreements	-Reverse repos	Yes	Self-assessment	Yes	Table 10, 11	Yes	Table 10
(g) units or shares of other MMFs	-Shares issued by other MMFs	Yes	Self-assessment	Yes	Table 10, 11	Yes	Table 10

Table 10

Assets	Article	CQS
Assets referred to in Article 17(7)[1] which are highly liquid and can be redeemed and settled within one working day and have a residual maturity of up to 190 days	24 (e)	1
Cash which is able to be withdrawn by giving prior notice of five working days without penalty	24 (e) 25 (d)	
Weekly maturing assets	24 (e) 25 (d)	
Reverse repurchase agreements which are able to be terminated by giving prior notice of five working days	24 (e) 25 (d)	
x100% = Weekly liquid assets (bucket 1)		
Assets referred to in Article 17(7) which can be redeemed and settled within one working week	17(7)	1,2
Money market instruments or units or shares of other MMFs which they are able to be redeemed and settled within five working days	24 (e) 25 (e)	1,2
Eligible securitisations and asset-backed commercial paper (ABCPs)	9(1)(b)	1
x85% = Weekly liquid assets (bucket 2)		

Table 11

Net outflows (%)	
Professional investor	25
Retail investor	15

5.7. Common reference parameters of the stress test scenarios in relation to hypothetical macro systemic shocks affecting the economy as a whole

Scope of the scenario

MMFR Eligible assets	Typical assets	Macro	
		Stressed	Parameters
(a) money market instruments	-Certificate of deposit (CD)	Yes	Tables 1,2,3,4,5,6,7,8,10,11
	-Commercial Paper (CP)	Yes	Tables 1,2,3,4,5,6,7,8,10,11
	-Government bonds, treasury and local authority bills	Yes	Tables 1,2,3,4,5,6,7,8,10,11
	-Corporate bonds	Yes	Tables 1,2,3,4,5,6,7,8,10,11
(b) eligible securitisations and asset-backed commercial paper (ABCPs)	-Eligible securitisations	Yes	Tables 1,2,3,4,5,6,7,8,10,11
	-ABCPs	Yes	Tables 1,2,3,4,5,6,7,8,10,11
(c) deposits with credit institutions	-Deposits, of which time deposits	Yes	Tables 1,2,3,4,5,6,7,8,10,11
(d) financial derivative instruments	-Financial derivative instruments dealt in on a regulated market	Yes	Tables 1,2,3,4,5,6,7,8,10,11
	-Financial derivative instruments dealt OTC	Yes	Tables 1,2,3,4,5,6,7,8,10,11
(e) repurchase agreements	-Repos	No	Tables 1,2,3,4,5,6,7,8,10,11
(f) reverse repurchase agreements	-Reverse repos	Yes	Tables 1,2,3,4,5,6,7,8,10,11
(g) units or shares of other MMFs	-Shares issued by other MMFs	Yes	Tables 1,2,3,4,5,6,7,8,10,11

6. Appendix

A.

Example of stress combining the various factors mentioned in sections 4.2 to 4.7 with investors' redemption requests

A practical example of one possible implementation of the section "Combination of the various factors mentioned in the following sections 4.2 to 4.7 with investors' redemption requests" is given below.

The table below estimates the losses incurred by the MMF in the event of redemptions or market stress (credit or interest rate shocks).

First scenario: credit premium shock of 25 bps

Second scenario: interest rate shock of 25 bps

			Three largest investors (25%) ↓						Very stable investors (15%) ↓	
Redemptions	0%	10%	20%	30%	40%	50%	60%	70%	80%	90%
Initial portfolio			2 bps	3 bps	5 bps	6 bps	8 bps	9 bps	11 bps	12 bps
First scenario	7 bps	9 bps	13 bps	18 bps	24 bps	32 bps	45 bps	66 bps	110 bps	236 bps
Second scenario	3 bps	4 bps	6 bps	9 bps	12 bps	16 bps	21 bps	28 bps	38 bps	85 bps
WAL (days)	105	117	131	149	169	192	219	249	290	320

This stress test shows that a redemption by the three largest investors (25% of net assets) would push the weighted average life (WAL) beyond the 120-day regulatory threshold (for a short-term money market fund) and cause the portfolio to lose in the region of 2-3 bps under normal conditions. The same level of cumulative redemptions with a 25 bps rise in credit premium would cause a loss of around 13-18 bps.

B.

Example of Redemptions based on an investor behaviour model, in accordance with the breakdown of liabilities by investor category. This implies the simulation of the behaviour of each type of investor and establishes a simulation based on the composition of the liabilities of the MMF.

Example of investor classification and simulation of their behaviour (the figures shown are not real): Investor type	Record redemptions for this investor type		
	Over one day	Over one week	Over one month
Large institutional	25%	75%	100%
Group entity (bank, insurance, own account)	20%	40%	40%
Investment fund	20%	65%	100%
Small institutional	10%	25%	40%
Private banking network	15%	40%	75%
Retail investor with distributor A	5%	10%	20%
Retail investor with distributor B	7%	15%	20%

	Stressed redemptions for this investor category
Large institutional	75%
Group entity (bank, insurance, own account)	0% (in agreement with the AMC)
Investment fund	65%
Small institutional	25%
Private banking network	40%
Retail investor with distributor A	10%
Retail investor with distributor B	15%

In order to build such a simulation of this kind, the manager needs to make assumptions about the behaviour of each investor type, based in part on historical redemptions. In the example above, the manager has noted that the retail investors who invested through distributor A are historically slower to exit in the event of difficulty, but that they exhibit the same behaviour over one month as retail investors who invested through distributor B. This fictitious example shows a possible classification that the manager may use based on the data available on the liabilities of the MMF and the behaviour of its investors.

C.

66. Examples of global stress test scenarios that the manager could consider:
67.

i. the Lehman Brothers' event with the calibration of all relevant factors one month ahead of the failure of this firm;

ii. A) a scenario including a combination of the 3 following factors: i) a parallel shift in interest rate (x) ii) a shift in credit spreads (y) and iii) a redemption stress (z));

iii. B) a scenario including a combination of the 3 following factors: i) a parallel shift in interest rate (x) ii) a shift in credit spreads (y) and iii) a redemption stress (z)) Variables x, y and z being the worst figures/shifts experienced by the fund, on an independent basis, for the last 12 months.