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ESRB
European Systemic Risk Board
European System of Financial Supervision

Adverse scenario for the European Securities and Markets Authority's money market fund stress testing guidelines in 2022

Introduction

The European Supervisory Authorities, in cooperation with the European Systemic Risk Board (ESRB), are required by legislation to conduct stress tests to assess the resilience of financial institutions or market participants to adverse market developments. As part of this cooperation, the ESRB designs scenarios involving adverse economic and financial market developments.

This document describes the ESRB's adverse financial market scenario for the stress-testing exercise carried out by the European Securities and Markets Authority (ESMA). ESMA has updated guidelines for managers of money market funds (MMFs) who are required to conduct internal stress tests and report the results to the national competent authorities and ESMA.[1] For this purpose the ESRB, in collaboration with the European Central Bank (ECB) and ESMA, has updated the stress parameters for the 2022 ESMA MMF guidelines.[2] The scenario was approved by the ESRB General Board on 26 October 2022 and transmitted to ESMA on 4 November 2022.

All assumptions about redemptions and the additional guidance on applying the scenario are provided by ESMA as part of its MMF stress-testing guidelines.

Scenario methodology and calibration

This section discusses the calibration methodology and the main sources of risk that lead to the adverse scenario, as well as the key features that ESMA considers relevant to the MMF

[1] Article 28 of Regulation (EU) 2017/1131 of the European Parliament and of the Council of 14 June 2017 on money market funds (OJ L 169, 30.6.2017, p. 8) (the "MMF Regulation") provides that ESMA will issue guidelines that establish common reference parameters for the stress test scenarios to be included in the stress tests that managers of MMFs are required to conduct.
[2] The scenario presented in this document is not a forecast. It should not be interpreted as the ESRB's expectations for future economic and financial developments including future monetary policy decisions and their impact. It instead constitutes a severe yet plausible hypothetical scenario.

sector. The calibration of the scenario has benefited from interactions with ESMA and from discussions with ESRB member institutions.

Calibration methodology

The methodology for the scenario calibration is based on a non-parametric application of a multivariate copula model, as used in previous stress tests like those conducted under the 2021 ESMA MMF stress-testing guidelines.[3] The scenario is the outcome of several simulations based on a number of triggers that reflect the main sources of financial stability risk, with a special focus on corporate and government credit spreads, swap rates, foreign exchange rates and securitisations in the European Union and other advanced economies. The calibration sample and probability of the triggering events have been set in close collaboration with ESMA to reflect the main features of the scenario based on the current risk landscape identified by the ESRB General Board. Specifically, the sample period chosen for the calibration is January 2008 to September 2022 and the probability of the triggering events is set over a one-quarter horizon for all the tables in the scenario, except for the table referring to liquidity shocks that is set over a five-day horizon. The shocks reported should be interpreted as one-off, instantaneous, and permanent shifts in asset prices relative to their cut-off date levels, as specified in ESMA's guidelines.

Scenario

The scenario reflects the main elements raised in the ESRB's assessment of prevailing sources of systemic risk identified for the EU financial system as at September 2022, which also contains the warning issued by the ESRB itself on vulnerabilities in the Union's financial system.[4] These include: (i) major disruptions of supply chains coupled with rising commodity prices and interest rates amid persistently high inflation, (ii) deteriorating profitability prospects for banks, despite the positive impact of higher rates on interest income, and non-bank financial institutions, (iii) a re-emergence of sovereign and corporate financing risks and debt sustainability concerns, and (iv) abrupt and disorderly asset price adjustments affecting both financial asset and real estate prices.

The adverse scenario is calibrated to be severe, consistent with the uncertainty about the economic consequences of the Russian invasion of Ukraine, geopolitical tensions and the resurgence of the coronavirus (COVID-19) pandemic, which is being compounded with zero-tolerance policies in some regions. In the adverse scenario, these developments further exacerbate supply chain disruptions and ultimately amplify inflationary pressures stemming from high commodity prices. They will have a bigger impact on the sectors most exposed to the

[3] See "Technical note on the Financial Shock Simulator (FSS)", ECB, Frankfurt am Main, 25 February 2019.

[4] See "Warning of the ESRB of 22 September 2022 on vulnerabilities in the Union financial system", ESRB, Frankfurt am Main, 22 September 2022.

ensuing shocks – for instance those heavily reliant on energy or agricultural commodities, or those facing higher levels of debt, also because of the COVID-19 pandemic. Corporate sector profitability expectations would reflect these degraded prospects and in turn drive up credit risk premia, resulting in wider credit spreads and rating downgrades worldwide.

Moreover, the prevailing high level of pandemic-induced government debt around the world, combined with expectations of sustained higher interest rates, will spark sovereign debt sustainability concerns, leading to sharp increases in risk premia and sovereign spreads worldwide. As a result, rising government bond yields will spill over to other asset classes, including corporate bonds. This increase in interest rates will be reflected in the prudential valuation of financial instruments held at fair value, which are significantly affected by market volatility, therefore amplifying the severity of the liquidity shocks.

Lastly, higher risk-free rates will also lead to a generalised tightening of financial conditions and trigger an abrupt adjustment in asset prices, affecting both financial asset and real estate prices and leading to a more volatile market.

Annex A

Table A.1: Shocks to swap rates

Shocks to interest rate yields Absolute changes (basis points)							
Geographic Area	**Country**	**Description**	**1M**	**3M**	**6M**	**1Y**	**2Y**
EU	**Euro area**	Interest rate swap on the EUR (euro)	34	34	45	56	68
EU	**Bulgaria**	Interest rate swap on the BGN (Bulgarian lev)	34	34	45	56	68
EU	**Croatia**	Interest rate swap on the HRK (Croatian kuna)	34	34	45	56	68
EU	**Czech Republic**	Interest rate swap on the CZK (Czech koruna)	34	34	45	56	68
EU	**Denmark**	Interest rate swap on the DKK (Danish krone)	34	34	45	56	68
EU	**Hungary**	Interest rate swap on the HUF (Hungarian forint)	51	51	62	73	85
EU	**Poland**	Interest rate swap on the PLN (Polish zloty)	34	36	47	58	70
EU	**Romania**	Interest rate swap on the RON (Romanian leu)	43	54	65	77	88
EU	**Sweden**	Interest rate swap on the SEK (Swedish krona)	25	25	28	32	49
Rest of Europe	**United Kingdom**	Interest rate swap on the GBP (British pound)	43	43	57	71	85
Rest of Europe	**Iceland**	Interest rate swap on the ISK (Icelandic króna)					
Rest of Europe	**Norway**	Interest rate swap on the NOK (Norwegian krone)	26	26	33	41	52
Rest of Europe	**Russia**	Interest rate swap on the RUB (Russian ruble)					
Rest of Europe	**Switzerland**	Interest rate swap on the CHF (Swiss franc)	17	22	27	31	45
Rest of Europe	**Turkey**	Interest rate swap on the TRY (Turkish lira)	22	33	88	143	191
North America	**Canada**	Interest rate swap on the CAD (Canadian dollar)	37	37	49	62	74
North America	**United States**	Interest rate swap on the USD (US dollar)	49	49	67	86	97
Australia and Pacific	**Australia**	Interest rate swap on the AUD (Australian dollar)	24	29	46	64	75
Australia and Pacific	**New Zealand**	Interest rate swap on the NZD (New Zealand dollar)					
South and Central America	**Brazil**	Interest rate swap on the BRL (Brazilian real)					
South and Central America	**Chile**	Interest rate swap on the CLP (Chilean peso)	86	87	98	109	117
South and Central America	**Colombia**	Interest rate swap on the COP (Colombian peso)	58	58	78	99	115
South and Central America	**Mexico**	Interest rate swap on the MXN (Mexican peso)	88	88	95	102	114
Asia	**China**	Interest rate swap on the CNY (Chinese yuan)	18	18	19	21	26
Asia	**Hong Kong**	Interest rate swap on the HKD (Hong Kong dollar)	46	46	60	74	92
Asia	**India**	Interest rate swap on the INR (Indian rupee)					
Asia	**Japan**	Interest rate swap on the JPY (Japanese yen)	10	10	12	15	19
Asia	**Korea**	Interest rate swap on the KRW (South Korean won)					
Asia	**Malaysia**	Interest rate swap on the MYR (Malaysian ringgit)	23	30	39	47	60
Asia	**Singapore**	Interest rate swap on the SGD (Singapore dollar)	30	30	49	69	78
Asia	**Thailand**	Interest rate swap on the THB (Thai baht)					
Africa	**South Africa**	Interest rate swap on the ZAR (South African rand)	34	34	37	41	68
EU	**All countries**	Default value for countries not included in table 6	36	37	48	58	70
Other Advanced Economie	**All countries**	Default value for countries not included in table 6	30	31	41	51	62
Emerging Markets	**All countries**	Default value for countries not included in table 6	46	48	63	79	96

Note: The grey cells indicate the data that are not available.

Table A.2a: Shocks to government bond yields

Shocks to government bond yields Absolute changes (basis points)					
Geographic Area	**Country**	**3M**	**6M**	**1Y**	**2Y**
EU	**Austria**	65	85	105	129
EU	**Belgium**	76	93	106	131
EU	**Bulgaria**	94	132	146	183
EU	**Croatia**	63	76	107	134
EU	**Cyprus**	109	132	146	183
EU	**Czech Republic**	91	120	148	183
EU	**Denmark**	67	85	113	124
EU	**Finland**	64	83	103	127
EU	**France**	51	68	80	92
EU	**Germany**	40	56	68	85
EU	**Greece**	109	132	146	183
EU	**Hungary**	122	144	154	193
EU	**Ireland**	83	100	116	143
EU	**Italy**	95	116	128	160
EU	**Latvia**	73	86	105	123
EU	**Lithuania**	80	95	115	133
EU	**Luxembourg**	40	56	68	85
EU	**Malta**	81	96	117	135
EU	**Netherlands**	45	58	73	89
EU	**Poland**	99	117	125	167
EU	**Portugal**	99	129	137	166
EU	**Romania**	97	119	131	164
EU	**Slovakia**	78	92	111	131
EU	**Slovenia**	52	62	75	88
EU	**Spain**	89	106	128	150
EU	**Sweden**	58	67	86	106
Euro area (weighted averages)	**Euro area (weighted averages)**	**62**	**80**	**94**	**114**
EU (weighted averages)	**EU (weighted averages)**	**66**	**83**	**98**	**119**
Advanced economies	**United Kingdom**	60	70	87	102
Advanced economies	**Switzerland**	62	70	74	87
Advanced economies	**Norway**	61	78	84	109
Advanced economies	**Iceland**				
Advanced economies	**Liechtenstein**				
Advanced economies	**United States**	60	74	95	116
Advanced economies	**Japan**	36	44	65	85
Advanced economies	**Advanced economies (non-EU and non-US)**	**55**	**66**	**77**	**96**
Advanced economies	**Advanced economies (weighted average)**	**63**	**78**	**96**	**116**
Emerging markets	**Emerging markets**	**121**	**164**	**241**	**296**
World	**World**	**92**	**121**	**168**	**206**

Note: The grey cells indicate the data that are not available. The weighted averages are based on real GDP and some missing values have been interpolated. “Advanced economies (non-EU and non-US)” refers to all advanced economies outside of the EU and the United States (as defined by the International Monetary Fund).

Table A.2b: Shocks to government bond spreads

Shocks to sovereign spreads Absolute changes (basis points)					
Geographic Area	**Country**	**3M**	**6M**	**1Y**	**2Y**
EU	**Austria**	31	39	48	61
EU	**Belgium**	42	47	50	63
EU	**Bulgaria**	60	87	90	115
EU	**Croatia**	29	31	51	66
EU	**Cyprus**	75	87	90	115
EU	**Czech Republic**	57	75	89	113
EU	**Denmark**	32	40	56	56
EU	**Finland**	30	38	47	59
EU	**France**	17	23	23	24
EU	**Germany**	6	11	12	17
EU	**Greece**	75	87	90	115
EU	**Hungary**	71	82	82	108
EU	**Ireland**	49	54	60	75
EU	**Italy**	61	71	71	92
EU	**Latvia**	39	41	48	55
EU	**Lithuania**	46	49	58	65
EU	**Luxembourg**	6	11	12	17
EU	**Malta**	47	51	60	67
EU	**Netherlands**	11	12	17	21
EU	**Poland**	64	70	70	97
EU	**Portugal**	65	84	84	98
EU	**Romania**	43	53	54	76
EU	**Slovakia**	44	47	55	63
EU	**Slovenia**	18	18	18	20
EU	**Spain**	55	60	72	72
EU	**Sweden**	33	39	54	56
Euro area (weighted averages)	**Euro area (weighted averages)**	**28**	**35**	**37**	**46**
EU (weighted averages)	**EU (weighted averages)**	**32**	**38**	**41**	**51**
Advanced economies	**United Kingdom**	14	14	16	16
Advanced economies	**Switzerland**	40	43	43	43
Advanced economies	**Norway**	35	44	44	56
Advanced economies	**Iceland**				
Advanced economies	**Liechtenstein**				
Advanced economies	**United States**	8	9	9	18
Advanced economies	**Japan**	26	32	66	66
Advanced economies	**Advanced economies (non-EU and non-US)**	**29**	**33**	**42**	**45**
Advanced economies	**Advanced economies (weighted average)**	**26**	**30**	**37**	**42**
Emerging markets	**Emerging markets**	**73**	**101**	**162**	**200**
World	**World**	**49**	**66**	**100**	**121**

Note: The grey cells indicate the data that are not available. The weighted averages are based on real GDP and some missing values have been interpolated. “Advanced economies (non-EU and non-US)” refers to all advanced economies outside of the EU and the United States (as defined by the International Monetary Fund).

Table A.3: Shocks to foreign exchange rates (EUR appreciation against USD)

Shocks to FX (appreciation of the EUR against the USD) Relative changes (%)			
Geographic Area	**Description**	**Exchange rate name**	**Shock**
EU	EUR/BGN represents 1 EUR per x BGN (Bulgarian lev)	**EUR/BGN**	
EU	EUR/CZK represents 1 EUR per x CZK (Czech koruna)	**EUR/CZK**	10.0
EU	EUR/HRK represents 1 EUR per x HRK (Croatian kune)	**EUR/HRK**	
EU	EUR/HUF represents 1 EUR per x HUF (Hungarian forints)	**EUR/HUF**	15.3
EU	EUR/PLN represents 1 EUR per x PLN (Polish zloty)	**EUR/PLN**	14.0
EU	EUR/RON represents 1 EUR per x RON (Romanian leu)	**EUR/RON**	9.9
EU	EUR/SEK represents 1 EUR per x SEK (Swedish krona)	**EUR/SEK**	12.7
Rest of Europe	EUR/RSD represents 1 EUR per x RSD (Serbian dinar)	**EUR/RSD**	9.9
Rest of Europe	EUR/NOK represents 1 EUR per x NOK (Norwegian krone)	**EUR/NOK**	13.2
Rest of Europe	EUR/GBP represents 1 EUR per x GBP (British pound)	**EUR/GBP**	12.3
Rest of Europe	EUR/CHF represents 1 EUR per x CHF (Swiss franc)	**EUR/CHF**	8.4
Rest of Europe	EUR/RUB represents 1 EUR per x RUB (Russian ruble)	**EUR/RUB**	
Rest of Europe	EUR/TRY represents 1 EUR per x TRY (Turkish lira)	**EUR/TRY**	27.9
North America	USD/CAD represents 1 USD per x CAD (Canadian dollar)	**USD/CAD**	-15.0
North America	EUR/USD represents 1 EUR per x USD (US dollar)	**EUR/USD**	12.8
Australia and Pacific	AUD/USD represents 1 AUD per x USD (Australian dollar)	**AUD/USD**	18.9
Australia and Pacific	NZD/USD represents 1 NZD per x USD (New Zealand dollar)	**NZD/USD**	20.5
South and Central America	USD/ARS represents 1 USD per x ARS (Argentine peso)	**USD/ARS**	-8.3
South and Central America	USD/BRL represents 1 USD per x BRL (Brazilian real)	**USD/BRL**	-21.1
South and Central America	USD/MXN represents 1 USD per x MXN (Mexican peso)	**USD/MXN**	-16.0
Asia	USD/CNY represents 1 USD per x CNY (Chinese yuan renminbi)	**USD/CNY**	-3.8
Asia	USD/HKD represents 1 USD per x HKD (Hong Kong dollar)	**USD/HKD**	-0.7
Asia	USD/INR represents 1 USD per x INR (Indian rupee)	**USD/INR**	-7.1
Asia	USD/JPY represents 1 USD per x JPY (Japanese yen)	**USD/JPY**	-11.6
Asia	USD/KRW represents 1 USD per x KRW (South korean won)	**USD/KRW**	-14.0
Asia	USD/MYR represents 1 USD per x MYR (Malaysian ringgit)	**USD/MYR**	-7.2
Asia	USD/SGD represents 1 USD per x SGD (Singapore dollar)	**USD/SGD**	-6.1
Asia	USD/THB represents 1 USD per x THB (Thai baht)	**USD/THB**	-5.8
Asia	USD/TWD represents 1 USD per x TWD (New Taiwan dollar)	**USD/TWD**	
Africa	USD/ZAR represents 1 USD per x ZAR (South African rand)	**USD/ZAR**	-18.3

Notes: The grey cells indicate the data that are not available. A positive figure indicates an appreciation of the first currency against the second.

Table A.4: Shocks to foreign exchange rates (EUR depreciation against USD)

FX shocks (depreciation of the EUR against the USD) Relative changes (%)			
Geographic Area	**Description**	**Exchange rate name**	**Shock**
EU	EUR/BGN represents 1 EUR per x BGN (Bulgarian lev)	**EUR/BGN**	
EU	EUR/CZK represents 1 EUR per x CZK (Czech koruna)	**EUR/CZK**	-9.5
EU	EUR/HRK represents 1 EUR per x HRK (Croatian kune)	**EUR/HRK**	
EU	EUR/HUF represents 1 EUR per x HUF (Hungarian forints)	**EUR/HUF**	-14.0
EU	EUR/PLN represents 1 EUR per x PLN (Polish zloty)	**EUR/PLN**	-12.2
EU	EUR/RON represents 1 EUR per x RON (Romanian leu)	**EUR/RON**	-7.5
EU	EUR/SEK represents 1 EUR per x SEK (Swedish krona)	**EUR/SEK**	-11.1
EU	EUR/RSD represents 1 EUR per x RSD (Serbian dinar)	**EUR/RSD**	-10.3
EU	EUR/NOK represents 1 EUR per x NOK (Norwegian krone)	**EUR/NOK**	-15.1
EU	EUR/GBP represents 1 EUR per x GBP (British pound)	**EUR/GBP**	-15.3
Rest of Europe	EUR/CHF represents 1 EUR per x CHF (Swiss franc)	**EUR/CHF**	-8.8
Rest of Europe	EUR/RUB represents 1 EUR per x RUB (Russian ruble)	**EUR/RUB**	
Rest of Europe	EUR/TRY represents 1 EUR per x TRY (Turkish lira)	**EUR/TRY**	-23.3
North America	USD/CAD represents 1 USD per x CAD (Canadian dollar)	**USD/CAD**	20.0
North America	EUR/USD represents 1 EUR per x USD (US dollar)	**EUR/USD**	-17.1
Australia and Pacific	AUD/USD represents 1 AUD per x USD (Australian dollar)	**AUD/USD**	-21.0
Australia and Pacific	NZD/USD represents 1 NZD per x USD (New Zealand dollar)	**NZD/USD**	-22.8
South and Central America	USD/ARS represents 1 USD per x ARS (Argentine peso)	**USD/ARS**	27.7
South and Central America	USD/BRL represents 1 USD per x BRL (Brazilian real)	**USD/BRL**	27.7
South and Central America	USD/MXN represents 1 USD per x MXN (Mexican peso)	**USD/MXN**	21.5
Asia	USD/CNY represents 1 USD per x CNY (Chinese yuan renminbi)	**USD/CNY**	3.7
Asia	USD/HKD represents 1 USD per x HKD (Hong Kong dollar)	**USD/HKD**	0.7
Asia	USD/INR represents 1 USD per x INR (Indian rupee)	**USD/INR**	10.4
Asia	USD/JPY represents 1 USD per x JPY (Japanese yen)	**USD/JPY**	13.3
Asia	USD/KRW represents 1 USD per x KRW (South korean won)	**USD/KRW**	14.9
Asia	USD/MYR represents 1 USD per x MYR (Malaysian ringgit)	**USD/MYR**	9.0
Asia	USD/SGD represents 1 USD per x SGD (Singapore dollar)	**USD/SGD**	6.9
Asia	USD/THB represents 1 USD per x THB (Thai baht)	**USD/THB**	6.2
Asia	USD/TWD represents 1 USD per x TWD (New Taiwan dollar)	**USD/TWD**	
Africa	USD/ZAR represents 1 USD per x ZAR (South African rand)	**USD/ZAR**	22.2

Note: The grey cells indicate the data that are not available. A positive figure indicates an appreciation of the first currency against the second.

Table A.5: Shocks to bid-ask spreads

Shocks to bid-ask prices of government bonds Absolute changes (euro)				
	3M	6M	1Y	2Y
DE	0.13	0.21	0.36	0.58
ES	0.36	0.50	0.86	1.23
FR	0.14	0.32	0.68	1.03
IT	0.24	0.47	0.76	1.10
NL	0.19	0.40	0.72	1.07
Other	0.21	0.38	0.68	1.00

Shocks to bid-ask prices of corporate bonds Absolute changes (euro)		
	1Y	2Y
DE	0.76	0.81
ES	1.33	1.57
FR	0.89	1.38
IT	1.09	1.47
NL	0.84	1.36
Other	0.98	1.32

Note: Bid-ask shocks are calibrated over a five-day horizon.

Table A.6: Shocks to residential mortgage-backed securities spreads (RMBS)

Shocks to RMBS spreads Absolute changes (basis points)				
Geographic Area	AAA	AA	A	BBB
EU	121	139	148	206
North America	124	146	157	226
Asia	124	143	152	208
All	124	143	152	213

Table A.7: Shocks to corporate bonds

	Shocks to general corporate credit spreads [1-3Y] Absolute changes (basis points)			
	Non-financial	Financial covered	Financial	All
AAA	115	109	135	120
AA	145	121	158	141
A	175	133	181	163
BBB	245	240	307	264
BB	292	251	366	303
B	372	312	414	366
<=CCC	451	348	462	420
Investment grade	170	151	195	172
High yield	372	303	414	363
All	271	227	305	268

	Shocks to general corporate credit yields [1-3Y] Absolute changes (basis points)			
	Non-financial	Financial covered	Financial	All
AAA	172	166	191	176
AA	201	178	215	198
A	231	190	238	220
BBB	302	297	364	321
BB	349	307	423	360
B	428	368	471	422
<=CCC	507	404	518	477
Investment grade	227	207	252	229
High yield	428	360	471	420
All	327	284	361	324

Shocks to CDS indices Absolute changes (basis points)		
Geographic Area	Index	1Y
EU	Itraxx Overall 5y	146
	Itraxx Crossover 5y	483
	Itraxx High vol 5y	260
	Itraxx Non financial 5y	119
	Itraxx SubFinancial 5y	337
US	Investment yield CDSI	127
	High yield CDSI	421