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ESRB
European Systemic Risk Board
European System of Financial Supervision

Adverse scenario for the European Securities and Markets Authority's 2019 EU-wide central counterparty stress test

Introduction

In accordance with its mandate, the European Securities and Markets Authority (ESMA), in cooperation with the European Systemic Risk Board (ESRB), initiates and coordinates EU-wide stress tests to assess the resilience of central counterparties (CCP) to adverse market developments. ESMA plans to conduct the third stress test for CCP in 2019 and has asked the ESRB to provide the adverse market scenario for this exercise.

The European Central Bank (ECB), in close collaboration with the ESRB and ESMA, has developed the narrative and has calibrated the adverse scenario described in this document,[1] which has been approved by the ESRB General Board and transmitted to ESMA.

The shock profiles that are presented in this document should be interpreted as one-off, instantaneous and temporary shifts in asset prices relative to their end-2018 levels, lasting for at least five consecutive business days. A methodological note presents the tool developed by ECB staff to calibrate the financial shocks.[2]

Systemic risks and vulnerabilities addressed by the scenario

The scenario reflects the ESRB's assessment of prevailing sources of systemic risk for the EU financial system:

1. repricing of risk premia in global financial markets;
2. persistent weaknesses in balance sheets of EU banks, insurers and pension schemes;
3. debt sustainability challenges in EU sovereign, corporate and household sectors;
4. vulnerabilities in the EU shadow banking sector and contagion to the financial system.

[1] The scenario presented in this document is not a forecast. It should not be interpreted as either the ESRB's expectations about future economic and financial developments or any unintended consequences of future monetary policy decisions. It constitutes a severe yet plausible scenario that could arise if a risk environment such as the one explained in the note were to materialise.

[2] See the methodological note describing the Financial Shock Simulator.

These risks are addressed by the macro-financial scenario presented here. The scenario reflects the triggering of one or more of the sources of systemic risk to the EU financial system identified by the ESRB. These risks could materialise jointly and reinforce each other. The results are derived using a methodology that considers the joint empirical distribution of historical observations of the risk factors deemed relevant to EU CCP by ESMA to produce a coherent joint scenario.

Narrative of the scenario

The translation of the sources of systemic risk identified by the ESRB into concrete instantaneous shocks following triggers initiated in various market segments is described below.

The main trigger of the adverse scenario is a disorderly increase in risk premia as a result of increasing global political and policy uncertainty against a backdrop of high asset valuations. The abrupt increase in global risk premia would translate into a modest steepening of swap curves and a large fall in other asset prices, which would be amplified by a general sell-off of stocks by the non-banking sector. A general repricing of risk premia would also bring about a repricing of sovereign spreads, especially in the EU, where ratios of private and/or public debt to GDP in many countries remain well above the sustainability thresholds suggested by the literature. Yields would also increase on non-financial corporate bonds following the generalised increase in risk premia. This would be reflected in an overall negative impact on global investment and global demand for raw materials, causing a sharp downward movement in commodity prices.

The scenario is obtained by choosing the mean response of the conditioned variable in an adverse scenario for the triggering variables with a joint probability of 0.1% over a five-day horizon. The sample chosen for the calibration spans from January 2004[3] to December 2018. Due to data quality issues, an overlay has been added for a few risk factors concerning commodities to align the calibration with the 5-day historic minima.

[3] The model uses daily data and the majority of time series have sufficient data as of 2004.

Calibration of the scenario

Table 1: Shocks to swap rates LIBOR (horizon = five business days)

Shocks to interest rate swap LIBOR absolute changes (basis points)									
Geographic Area	**Country**	**Description**	**1M**	**3M**	**1Y**	**2Y**	**5Y**	**10Y**	**30Y**
EU	**Euro Area**	Interest rate SWAP on the EUR (euro)	20	20	31	35	48	41	48
EU	**Czech Republic**	Interest rate SWAP on the CZK (Czech koruna)	40	40	60	55	40	37	96
EU	**Denmark**	Interest rate SWAP on the DKK (Danish krone)	20	20	31	35	48	41	48
EU	**Hungary**	Interest rate SWAP on the HUF (Hungarian forint)	59	59	89	85	75	72	
EU	**Poland**	Interest rate SWAP on the PLN (Polish zloty)	23	23	34	41	63	62	53
EU	**Sweden**	Interest rate SWAP on the SEK (Swedish krona)	32	20			63	44	47
EU	**United Kingdom**	Interest rate SWAP on the GBP (British pound)	31	31	47	48	52	45	35
Rest of Europe	**Norway**	Interest rate SWAP on the NOK (Norwegian krone)	39	39	58	53	37	43	44
Rest of Europe	**Switzerland**	Interest rate SWAP on the CHF (Swiss franc)	19	19	28	29	33	34	37
North America	**Canada**	Interest rate SWAP on the CAD (Canadian dollar)	39	39	58	56	50	46	37
North America	**US**	Interest rate SWAP on the USD (US dollar)	15	15	22	28	46	42	34
Australia and Pacific	**Australia**	Interest rate SWAP on the AUD (Australian dollar)	30	30	45	48	58	64	72
Australia and Pacific	**New Zealand**	Interest rate SWAP on the NZD (New Zealand dollar)	31	31	46	47	48	48	
South and Central America	**Mexico**	Interest rate SWAP on the MXN (Mexican peso)	46	46	69			85	
Asia	**China**	Interest rate SWAP on the CNY (Chinese yuan)	48	48	72	68	57	79	
Asia	**Hong Kong**	Interest rate SWAP on the HKD (Hong Kong dollar)	55	55	82	78	67	63	
Asia	**India**	Interest rate SWAP on the INR (Indian rupee)	72	72	109	101	76	76	
Asia	**Japan**	Interest rate SWAP on the JPY (Japanese yen)	9	9	14	17	28	30	44
Asia	**Korea**	Interest rate SWAP on the KRW (South Korean won)	24	24	36	35	34	38	
Asia	**Singapore**	Interest rate SWAP on the SGD (Singapore dollar)	22	22	33	36	45	48	
Africa	**South Africa**	Interest rate SWAP on the ZAR (South African rand)	37	37	55	61	77	67	

Note: The grey cells show cases in which data are not available.

Table 2: Shocks to swap rates OIS (horizon = five business days)

Shocks to interest rate swap OIS absolute changes (basis points)									
Geographic Area	**Country**	**Description**	**1M**	**3M**	**1Y**	**2Y**	**5Y**	**10Y**	**30Y**
EU	**Euro Area**	Interest rate swap on the EUR (euro)	25	25	37	38	41	37	47
EU	**Denmark**	Interest rate swap on the DKK (Danish krone)	25	25	37				
EU	**Sweden**	Interest rate swap on the SEK (Swedish krona)	25	25	38				
EU	**United Kingdom**	Interest rate swap on the GBP (British pound)	31	31	47	52	68	44	35
Rest of Europe	**Switzerland**	Interest rate swap on the CHF (Swiss franc)	32	32	47	41	23	27	22
North America	**Canada**	Interest rate swap on the CAD (Canadian dollar)	41	41	61	55	38		
North America	**United States**	Interest rate swap on the USD (US dollar)	51	51	76	74	67	56	37
Australia and Pacific	**Australia**	Interest rate swap on the AUD (Australian dollar)	27	27	41				
Australia and Pacific	**New Zealand**	Interest rate swap on the NZD (New Zealand dollar)	34	34	50				
South and Central America	**Colombia**	Interest rate swap on the COP (Colombian peso)	24	24	36	42	60	86	
South and Central America	**Mexico**	Interest rate swap on the MXN (Mexican peso)		61			82		87
Asia	**India**	Interest rate swap on the INR (Indian rupee)	79	79	119	106	66	68	
Asia	**Japan**	Interest rate swap on the JPY (Japanese yen)	10	10	14	14	13	17	22
Asia	**Korea**	Interest rate swap on the KRW (South korean won)	26	26	39	40	40	43	21

Note: The grey cells show cases in which data are not available.

Table 3: Shocks to government bond yields (horizon = five business days)

		Government bond yield shocks absolute changes (basis points)					
Geographic Area	**Country abbreviation**	**Country**	**1Y**	**2Y**	**5Y**	**10Y**	**30Y**
EU	AT	**Austria**	45	49	62	57	64
EU	BE	**Belgium**	50	56	74	65	67
EU	BG	**Bulgaria**	46	51	69	67	
EU	HR	**Croatia**	48	55	77	58	
EU	CY	**Cyprus**	54	59	74	63	
EU	CZ	**Czech Republic**	50	54	68	59	55
EU	DK	**Denmark**	49	50	54	46	53
EU	FI	**Finland**	30	37	58	51	54
EU	FR	**France**	43	47	60	56	60
EU	DE	**Germany**	36	40	53	46	53
EU	GR	**Greece**	128			136	113
EU	HU	**Hungary**	45	53	75	67	
EU	IE	**Ireland**	45	50	63	57	64
EU	IT	**Italy**	82	86	99	82	85
EU	LV	**Latvia**			68	58	
EU	LT	**Lithuania**	116	112	101	121	
EU	LU	**Luxembourg**				57	
EU	MT	**Malta**			68	63	
EU	NL	**Netherlands**	41	45	57	51	55
EU	PL	**Poland**	36	44	69	64	67
EU	PT	**Portugal**	86	94	118	92	72
EU	RO	**Romania**	54	63	90	61	
EU	SK	**Slovakia**	48	51	60	49	54
EU	SI	**Slovenia**	39	50	85	80	54
EU	ES	**Spain**	53	61	87	76	79
EU	SE	**Sweden**	37	42	55	48	40
EU	UK	**United Kingdom**	75	80	93	79	80
EA	**EA**	**EA (weighted averages)**	51	54	69	62	65
EU	**EU**	**EU (weighted averages)**	54	58	73	64	67
Other advanced economies	CH	**Switzerland**	-1	-2	-5	-6	
Other advanced economies	NO	**Norway**	58	53	37	43	44
Other advanced economies	US	**United States**	47	48	52	47	
Other advanced economies	JP	**Japan**	0	0	-1	-2	-1
Other advanced economies	AU	**Australia**	49	46	38	41	41
Other advanced economies	CA	**Canada**	67	61	42	38	29

Note: The grey cells show cases in which data are not available.

Table 4: Shocks to exchange rates (horizon = five business days)

FX shocks relative changes (%)		
Geographic Area	**Description**	**Shock**
EU	EURCZK represents 1 EUR per x CZK (Czech koruna)	-4.5
EU	EURDKK represents 1 EUR per x DKK (Danish krone)	0.0
EU	EURGBP represents 1 EUR per x GBP (British pound)	8.9
EU	EURHRK represents 1 EUR per x HRK (Croatian kune)	-2.3
EU	EURHUF represents 1 EUR per x HUF (Hungarian forints)	-5.1
EU	EURNOK represents 1 EUR per x NOK (Norwegian krone)	-4.1
EU	EURPLN represents 1 EUR per x PLN (Polish zloty)	-2.6
EU	EURRON represents 1 EUR per x RON (Romanian leu)	-5.3
EU	EURSEK represents 1 EUR per x SEK (Swedish krona)	-2.8
Rest of Europe	EURCHF represents 1 EUR per x CHF (Swiss franc)	-14.4
Rest of Europe	EURRUB represents 1 EUR per x RUB (Russian ruble)	-11.0
Rest of Europe	EURUAH represents 1 EUR per x UAH (Ukrainian hryvnia)	-4.5
North America	EURCAD represents 1 EUR per x CAD (Canadian dollar)	-3.6
North America	EURUSD represents 1 EUR per x USD (US dollar)	-5.8
Australia and Pacific	EURAUD represents 1 EUR per x AUD (Australian dollar)	-7.3
Australia and Pacific	EURNZD represents 1 EUR per x NZD (New Zealand dollar)	-5.8
South and Central America	EURARS represents 1 EUR per x ARS (Argentine peso)	-6.7
South and Central America	EURBRL represents 1 EUR per x BRL (Brazilian real)	-7.8
South and Central America	EURCLP represents 1 EUR per x CLP (Chilean peso)	-5.4
South and Central America	EURCOP represents 1 EUR per x COP (Colombian peso)	-5.7
South and Central America	EURMXN represents 1 EUR per x MXN (Mexican peso)	-6.8
South and Central America	EURPEN represents 1 EUR per x PEN (Peruvian sol)	-5.5
Asia	EURCNY represents 1 EUR per x CNY (Chinese yuan renminbi)	-5.6
Asia	EURHKD represents 1 EUR per x HKD (Hong Kong dollar)	-5.7
Asia	EURIDR represents 1 EUR per x IDR (Indonesian rupiah)	-6.4
Asia	EURILS represents 1 EUR per x ILS (Israeli new shekel)	-4.6
Asia	EURINR represents 1 EUR per x INR (Indian rupee)	-5.4
Asia	EURJPY represents 1 EUR per x JPY (Japanese yen)	-10.1
Asia	EURKRW represents 1 EUR per x KRW (South Korean won)	-11.3
Asia	EURMYR represents 1 EUR per x MYR (Malaysian ringgit)	-5.4
Asia	EURPHP represents 1 EUR per x PHP (Philippine piso)	-4.9
Asia	EURSGD represents 1 EUR per x SGD (Singapore dollar)	-4.4
Asia	EURTHB represents 1 EUR per x THB (Thai baht)	-5.7
Asia	EURTWD represents 1 EUR per x TWD (Taiwan new dollar)	-5.4
Africa	EURDZD represents 1 EUR per x DZD (Algerian dinar)	-10.7
Africa	EUREGP represents 1 EUR per x EGP (Egyptian pound)	-8.0
Africa	EURMAD represents 1 EUR per x MAD (Moroccan dirham)	-2.8
Africa	EURZAR represents 1 EUR per x ZAR (South African rand)	-8.9

Note: A positive figure indicates an appreciation of the first currency against the other.

Shocks to FX implied volatilities absolute changes (volatility points x 100)		
Geographic Area	**Description**	**Shock**
EU	EUR per x CZK (Czech koruna): EURCZKV1M Curncy	6
EU	EUR per x GBP (British pound): EURGBPV1M Curncy	8
EU	EUR per x HUF (Hungarian forints): EURHUFV1M Curncy	12
EU	EUR per x PLN (Polish zloty): EURPLNV1M Curncy	10
EU	EUR per x SEK (Swedish krona): EURSEKV1M Curncy	5
North America	EUR per x USD (US dollar): EURUSDV1M Curncy	8
Asia	EUR per x CNY (Chinese yuan renminbi): USDCNYV1M Curncy	6

Table 5: Shocks to equity indices (horizon = five business days).

Shocks to equity prices percentage changes (%)				
Geographic Area	**Country**	**Country**	**Index name**	**Shock**
EU	AT	**Austria**	Austrian Traded Index	-17
EU	BE	**Belgium**	Belgium BEL 20 Index	-13
EU	BG	**Bulgaria**	Bulgaria Stock Exchange SOFIX Index	-15
EU	CY	**Cyprus**	Cyprus Stock Exchange General Index	-18
EU	HR	**Croatia**	Zagreb Stock Exchange CROBEX Index	-14
EU	CZ	**Czech Republic**	Prague Stock Exchange Index	-20
EU	DK	**Denmark**	OMX Copenhagen	-18
EU	EE	**Estonia**	Nordic Exchange OMX Tallinn (OMXT) Index	-12
EU	FI	**Finland**	Nordic Exchange OMX Helsinki Price Index	-16
EU	FR	**France**	France CAC 40 Index	-15
EU	DE	**Germany**	DAX 30 Performance Index	-14
EU	GR	**Greece**	Athens Stock Exchange Main General Index	-20
EU	HU	**Hungary**	Budapest Stock Exchange BUX Index	-19
EU	IE	**Ireland**	Irish Stock Exchange ISEQ Overall Index	-20
EU	IT	**Italy**	FTSE Milan Stock Exchange MIB	-19
EU	LV	**Latvia**	Nordic Exchange OMX Riga (OMXR) Index	-13
EU	LT	**Lithuania**	Nordic Exchange OMX Vilnius General Index	-14
EU	LU	**Luxembourg**	Luxembourg Stock Exchange LuxX Index	-17
EU	MT	**Malta**	Matla Stock Exchange Index	-6
EU	NL	**Netherlands**	Amsterdam Exchange (AEX) Index	-16
EU	PL	**Poland**	Warsaw Stock Exchange General Index	-14
EU	PT	**Portugal**	Portugal PSI-20 Index	-16
EU	RO	**Romania**	Romania BET 10 Index	-19
EU	SK	**Slovakia**	Bratislava Stock Exchange SAX Index	-15
EU	SI	**Slovenia**	Slovenian Blue Chip Index (SBI TOP)	-14
EU	ES	**Spain**	Spain IBEX 35 Index	-18
EU	SE	**Sweden**	Nordic Exchange OMX Stockholm Options Marknad Value Index	-13
EU	UK	**United Kingdom**	Financial Times Stock Exchange (FTSE) 100 Index	-14
EA (weighted averages)	**EA**	**EA (weighted averages)**	**From domestic shocks**	**-16**
EU (weighted averages)	**EU**	**EU (weighted averages)**	**From domestic shocks**	**-16**
NO	NO	**Norway**	Oslo Exchange All Share Index	-16
Europe	EUX50BB	**Europe (Eurostoxx)**	Eurostoxx 50	-15
Adanced Economies	CH	**Switzerland**	Swiss Market Index	-14
Other advanced economies	**OA**	**Other advanced economies**	**MSCI World Index Future**	**-7**
South America	BR	**Brazil**	MSCI Brazil Index Future	-14
Asia	IN	**India**	BSE SENSEX	-9
Asia	ASIAMSCIAC	**Asia ex Japan**	MSCI AC Asia ex Japan Index Future	-9
Asia	ASIAMSCIPACA	**Asia Pacific ex Japan**	MSCI Pacific ex Japan Index Future	-5
Emerging markets	**EME**	**Emerging markets**	**MSCI Emerging Markets Index Future**	**-7**

Shocks to implied volatility changes (volatility points X100)				absolute
Geographic Area	Country	Country	Index name	Shock
Europe	EUX50BB	**Europe (Eurostoxx)**	Eurostoxx 50	30
EU	FR	**France**	France CAC 40 Index	27
EU	DE	**Germany**	DAX 30 Performance Index	34
EU	UK	**United Kingdom**	Financial Times Stock Exchange (FTSE) 100 Index	28

Table 6: Shocks to sector equity indices (horizon = five business days)

Shocks to STOXX index components percentage changes (%)		
Index name	**Sector**	**Shock**
Eurostoxx 50	**HEADLINE INDEX**	-15
STOXX Europe 600 Consumer Goods Industry	**Consumer goods**	-11
STOXX Europe 600 Basic Materials Industry	**Basic**	-20
STOXX Europe 600 Utilities Industry*	**Utilities**	-15
STOXX Europe 600 Consumer Services Industry	**Consumer services**	-13
STOXX Europe 600 Industrials Industry	**Industrials**	-16
STOXX Europe 600 Health Care Industry*	**Health**	-11
STOXX Europe 600 Banks Supersector	**Banks**	-21
STOXX Europe 600 Insurance Supersector	**Insurance**	-18
STOXX Europe 600 Financial Services Supersector	**Financial**	-17
STOXX Europe 600 Real Estate Supersector	**Real**	-15
STOXX Europe 600 Oil & Gas Supersector	**Oil**	-17
STOXX Europe 600 Telecommunications Supersector	**Telecommunications**	-14
STOXX Europe 600 Technology Supersector	**Technology**	-16

Shocks to historical volatilities of STOXX index components (volatility points x100)		
Index name	**Sector**	**Shock**
Eurostoxx 50	**HEADLINE INDEX**	30
STOXX Europe 600 Industrial Goods and Svs	**Industrial Goods and Sevices**	46
STOXX Europe 600 Utilities Industry*	**Utilities**	19
STOXX Europe 600 Cons and Material	**Construction and materials**	19
STOXX Europe 600 Health Care Industry*	**Health Care**	37
STOXX Europe 600 Banks Supersector	**Banks**	37
STOXX Europe 600 Insurance Supersector	**Insurance**	24
STOXX Europe 600 Financial Services Supersector	**Financial**	24
STOXX Europe 600 Real Estate Supersector	**Real Estate**	29
STOXX Europe 600 Oil & Gas Supersector	**Oil**	37
STOXX Europe 600 Telecommunications Supersector	**Telecommunications**	27
STOXX Europe 600 Technology Supersector	**Technology**	17

Table 7: Shocks to commodity prices (horizon = five business days)

			Future 1m (%)	Future 6m (%)	Future 9m (%)	Future 12m (%)	Implied volatility, Future 1m (vola x 100 points)
Metals	Silver		-23	-23	-23	-19	48
	Gold		-11	-11	-11	-11	25
	Palladium		-23				
	Steel	JBO	-18				
		JBP	-10				
		RBT	-17				
Industrial	Coal		-23				
	EU Emission Allowance		-28				66
	Iron Ore		-28				
Alimentary	Cocoa		-21				14
	Coffee	Arabica	-16				32
		Robusta	-13				
	Corn		-29				36
	Soy		-18				20
	Sugar		-17				36
	Wheat		-17				37

	Spot (%)	3m rolling forward (%)	15m rolling forward (%)	27m rolling forward (%)	63m rolling forward (%)
Aluminium	-14	-14	-13	-12	-11
Copper	-16	-15	-15	-14	-13
Nickel	-23	-23	-20	-19	-18
Lead	-20	-20	-20	-15	-15
Tin	-19	-19	-20		
Zinc	-18	-17	-17	-18	-17

		Future 1m (%)	Future 2m (%)	Future 3m (%)	Future 4m (%)	Future 5m (%)	Future 6m (%)	Future 9m (%)	Future 12m (%)	Implied volatility, Future 1m (vola points x 100)
Crude Oil	Brent	-21	-20	-20	-19	-19	-19	-18	-17	67
	WTI	-18	-17	-16	-16	-16	-15	-13	-12	69

	Index (%)
Baltic exchange - Dry	-20
Baltic exchange - Clean Tanker	-11
Baltic exchange - Dirty Tanker	-14

Note: The grey cells show cases in which data are not available. Due to data quality issues, an overlay has been added for a few risk factors concerning commodities to align the calibration with the 5-day historic minima.

		1st Future (%)	2nd Future (%)	3rd Future (%)	4th Future (%)	5th Future (%)	6th Future (%)	Implied volatility, Future 1m (vola points x 100)
Power Germany	Monthly	-22	-16	-15	-16	-15	-17	45
	Quarterly	-20	-20	-18	-18			
	Yearly	-7	-6	-6				
Power Spain	Monthly	-21						
	Quarterly	-20	-18	-16	-16			
	Yearly	-8	-6	-4				
Power France	Monthly	-28	-21	-19	-21	-20		
	Quarterly	-27	-20	-18	-18			
Power Italy	Monthly	-16	-11	-10	-13	-16		
	Quarterly	-12	-8	-7	-7			
	Yearly	-8	-6	-4				
Power Nordic countries	Monthly	-18	-15	-13	-14			
	Quarterly	-13	-11	-6	-6			
	Yearly	-12	-8	-4				
Power United Kingdom	Monthly	-14	-11	-10	-11	-11	-11	
	Quarterly	-11	-11	-10	-10			
Power United States	Monthly	-40	-35	-21	-16	-17	-16	

		1st Future (%)	2nd Future (%)	3rd Future (%)	4th Future (%)	5th Future (%)	6th Future (%)
Gas Austria	Monthly	-11	-7	-3			
	Quarterly	-8	-4	-2			
Gas Germany	Monthly	-21	-18	-16			
	Quarterly	-15	-13	-12			
Gas France	Monthly	-18	-16	-15			
	Quarterly	-13	-12	-12			
Gas Italy	Monthly	-10	-7	-5			
	Yearly	-4	-3	-2			
Gas Netherlands	Monthly	-15	-13	-13	-9	-7	-8
	Quarterly	-13	-13	-12	-12		
	Yearly	-8	-7	-6			
Gas United Kingdom	Monthly	-25	-21	-22	-22	-21	-16
	Quarterly	-18	-16	-16	-16		
Gas United States	Monthly	-27	-25	-26	-25	-25	-19

Note: The grey cells show cases in which data are not available. Due to data quality issues, an overlay has been added for a few risk factors concerning commodities to align the calibration with the 5-day historic minima.

Table 8: Shocks to swaptions (horizon = five business days)

Shocks to swaptions relative changes (multiple)	

Series	Shock
EUNE11 SMKO Curncy	1.37
EUNE12 SMKO Curncy	1.26
EUNE15 SMKO Curncy	1.25
EUNE110 SMKO Curncy	1.18
EUNE130 SMKO Curncy	1.18
BPNE11 SMKO Curncy	1.18
BPNE12 SMKO Curncy	1.17
BPNE15 SMKO Curncy	1.13
BPNE110 SMKO Curncy	1.12
BPNE130 SMKO Curncy	1.13
USSN011 SMKO Curncy	1.23
USSN012 SMKO Curncy	1.20
USSN015 SMKO Curncy	1.19
USSN0110 SMKO Curncy	1.14
JPNE11 SMKO Curncy	1.47
JPNE12 SMKO Curncy	1.58
JPNE15 SMKO Curncy	1.69
JPNE110 SMKO Curncy	1.32
EUSN011 BBIR Curncy	1.76
EUSN012 BBIR Curncy	2.02
EUSN015 BBIR Curncy	1.29
EUSN0110 BBIR Curncy	1.24
EUSN0130 BBIR Curncy	1.20
BPSN011 BBIR Curncy	1.34
BPSN012 BBIR Curncy	1.28
BPSN015 BBIR Curncy	1.23
BPSN0110 BBIR Curncy	1.15
BPSN0130 BBIR Curncy	1.16
USSN011 BBIR Curncy	1.27
USSN012 BBIR Curncy	1.22
USSN015 BBIR Curncy	1.22
USSN0110 BBIR Curncy	1.21
USSN0130 BBIR Curncy	1.19
SFSN011 BBIR Curncy	1.26
SFSN012 BBIR Curncy	1.23
SFSN015 BBIR Curncy	1.22
SFSN0110 BBIR Curncy	1.11
SFSN0130 BBIR Curncy	1.11
JYSN011 BBIR Curncy	2.80
JYSN012 BBIR Curncy	2.36
JYSN015 BBIR Curncy	1.88
JYSN0110 BBIR Curncy	1.67
JYSN0130 BBIR Curncy	1.38

Series	Shock
CDSN011 BBIR Curncy	1.22
CDSN012 BBIR Curncy	1.18
CDSN015 BBIR Curncy	1.18
CDSN0110 BBIR Curncy	1.15
CDSN0130 BBIR Curncy	1.16
DKSN011 BBIR Curncy	1.65
DKSN012 BBIR Curncy	1.35
DKSN015 BBIR Curncy	1.20
DKSN0110 BBIR Curncy	1.22
DKSN0130 BBIR Curncy	1.19
NKSN0110 BBIR Curncy	1.24
NKSN0130 BBIR Curncy	1.24
SKSN011 SMKO Curncy	1.22
SKSN012 SMKO Curncy	1.20
SKSN015 SMKO Curncy	1.13
SKSN0110 SMKO Curncy	1.12
SKSN0130 SMKO Curncy	1.12
SDSN011 BBIR Curncy	1.17
SDSN012 BBIR Curncy	1.16
SDSN015 BBIR Curncy	1.16
SDSN0110 BBIR Curncy	1.13
SDSN0130 BBIR Curncy	1.15
HDSN011 BBIR Curncy	1.15
HDSN012 BBIR Curncy	1.15
HDSN015 BBIR Curncy	1.17
HDSN0110 BBIR Curncy	1.12
HDSN0130 BBIR Curncy	1.12
ADSN011 BBIR Curncy	1.32
ADSN012 BBIR Curncy	1.26
ADSN015 BBIR Curncy	1.19
ADSN0110 BBIR Curncy	1.18
ADSN0130 BBIR Curncy	1.17
NDSN011 BBIR Curncy	1.20
NDSN012 BBIR Curncy	1.19
NDSN015 BBIR Curncy	1.13
NDSN0110 BBIR Curncy	1.12
NDSN0130 BBIR Curncy	1.13
MPSN011 BBIR Curncy	1.07
MPSN012 BBIR Curncy	1.08
MPSN015 BBIR Curncy	1.09
MPSN0110 BBIR Curncy	1.09
MPSN0130 BBIR Curncy	1.09

Table 9: Shocks to credit spreads (horizon = five business days)

General:

Shocks to Credit Default Spreads relative change (multiple with respect to starting point)		
Geographic Area	Index	Shock
EU	Itraxx Overall 5y	1.5
	Itraxx Crossover 5y	1.4
	Itraxx Senior fin 5y	1.7
	Itraxx SubFinancial 5y	1.7
US	Investment yield CDSI	1.2
	High yield CDSI	1.2

Individual:

Shocks to Credit Default Spreads relative change (multiple with respect to starting point)		
Geographic Area	Sector	Shock
EU	Financial	1.90
	Basic Materials	1.68
	Consumer, Cyclical	1.55
	Energy	2.04
	Consumer, Non-cyclical	1.36
	Diversified	1.52
	Industrial	2.30
	Communications	1.57
	Technology	1.63
	Utilities	1.66

Table 10: Shocks to corporate debt yields (horizon = five business days)

Shocks to iBoxx Covered bond yields shocks absolute changes (bps)		
Geographic Area	Maturity	Shock
EA	1 - 3Y	29
	3 - 5Y	30
	5 - 7Y	29
	7 - 10Y	27
	> 10Y	30

Shocks to (Merrill Lynch) BBB bonds yields absolute changes (bps)		
Geographic Area	Maturity	Shock
EA	1 - 3Y	60
	3 - 5Y	73
	5 - 7Y	82
	7 - 10Y	90