



Takasbank
Liquidity Risk Stress For CCP Markets
Central Counterparty Department



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Introduction

- Stress Testing, is defined as all the methods employed to evaluate the fragility of a portfolio, financial institution or the financial system under shocks and extraordinary market conditions.
- Stress tests reflect the change in market price, the shifts in the yield curve and the sudden changes that may occur in the yield and shape of this curve; the conditions whereby the assumptions made in order to measure the risk their validity; the extreme movements experienced in the past, the effects of the crisis likely to prevail in the past and in the future and also the analysis to be made includes all financial tools and portfolios.



Takasbank-CCP Liquidity Stress Tests

- The stress tests, in the CCP services, are used to test the adequacy of the financial resources comprising of collaterals, guarantee fund contributions and other financial resources **under extreme market conditions**.
- Stress tests are used predominantly in analyzing fragilities against credit and liquidity risks exposure.
- Credit risk-related stress testing focuses on whether the losses incurred after the default of a clearing member could be covered by with default management resources,
- Liquidity risk stress tests focus on the adequacy of only the liquid part of default management resources
- The qualification criterion used by the Takasbank (at the basis scenario) is whether “qualified default management resources” along with capital allocated and committed, if liquid, cover fund requirement stemming from the default of the member having the highest risk.
- Liquidity stress testing also takes into consideration the use of the resource needs arising under the historical credit risk stress scenarios, the changes taking place in the situations of liquidity providers and the possible swift changes in the liquidity preference in the market.

Takasbank Default Management Resources

- In case of any default in the markets to which the CCP service is provided, the resources are as follows:
 1. Initial Margin of member in default
 2. Default Fund Contribution of member in default
 3. Dedicated capital of Takasbank for covered risks (Skin in the Game)
 4. Default fund contributions of non-defaulting members (Funded)
 5. Additional default fund contributions of non-defaulting members (Unfunded)
 6. Commitment from remaining capital of Takasbank

- The resources except for the 5th layer are classified as the **funded** resources which will be used immediately in case of any default and it is aimed to meet the margin requirement firstly with these resources in case of default of the largest two members with the highest exposure.

- The additional guarantee fund contribution to be requested from non-defaulted members constitute the **non-funded** default Management resources.

Local Regulation on Stress Testing

- Pursuant to **Article 40** of the Central Counterparty Regulation, Takasbank is obliged to;
 - Confirm the adequacy of the collaterals in the markets to which the CCP service is provided, the guarantee fund contributions and the resources it allocates and commits from its capital through stress tests,
 - Report the stress testing results quarterly to the Board of Director sand to the Capital Markets Board.



International Regulation on Stress Testing

In the CPMI-IOSCO's document of Principles for Financial Infrastructure Institutions,

-Pursuant to the Principle No. 4.4, Central Counterparties,

- Are obliged to demonstrate whether they can meet or not the possible losses with its **financial resources** in case that the **two members with the largest exposure and their shareholdings** have defaulted **under rare but possible extraordinary stress conditions**.

-Pursuant to the Principle No. 7.4,

- A central counterparty is obliged to have adequate **liquid resources** to meet payment obligations with a high confidence level in case of default of a participant who will impose the CCP to **the highest amount of total payment obligations under various stress scenarios**.

Takasbank Stress Testing Model 1/5

Stress testing is based on the **uncovered risk** amounts to which the members are exposed under extreme market conditions.

- Theoretically, in identification of extreme market conditions, *statistical time series based historical scenarios* which represent the market movements that may occur under a higher confidence level than the one employed in calculation of the initial margin and *historical event scenarios* which are based on the past crisis experience are utilized.



Takasbank Liquidity Stress Testing Model 2/5

1. Base Liquidity Scenarios:

- Base scenario covers stress conditions at 99.90% confidence level in the past 5 years' historical data with holding periods of 3 days for the Derivatives Market, 2 days for the Securities Lending Market, Borsa İstanbul Money Market and Borsa İstanbul Cash Equity.
- Related parameters are applied via the Historical Simulation Value at Risk Method.
- Liquidity stress test (base scenario), conducted on daily basis, tests whether **total resource requirement** arising under the conditions of the base credit risk stress scenario of the two member with the greatest risk and their shareholdings *against* the **qualified default management resources**(resources invested in ON or available and those are eligible for CBRT liquidity facilities)

Takasbank Liquidity Stress Testing Model 3/5

2. Historical Event Scenarios :

- Historical event scenarios are applied for Derivatives Market, Securities Lending Market and Cash Equity and scenarios covers the highest percentage changes occurred in the stock exchange index and TRY/USD exchange between 2001, 2008, 2018, 2021 and 2022.
- The historical event scenarios, different from the base scenario, have been applied only to the positions as of the last days of the months in the analysis period and the **total resource requirement** arising from the default of the **first member** and **first two** with the highest risk exposure is compared with the **default management resources (Cover 1, Cover 2)**.

Takasbank Liquidity Stress Testing Model 4/5

3. Market Liquidity Scenario:

–Scenario used in the basic liquidity stress test is also applicable for this hypothetical scenario .

-**Uncovered risk exposure** is increased by **10% assuming** that liquidity providers would act worse than expected even in stressed conditions.

-It is measured whether qualified liquid assets that are explained under the basic liquidity stress test cover marginal increase in uncovered exposure under Cover 2.

Takasbank Liquidity Stress Testing Model 5/5

4. Cash Collateral Scenarios:

Since MKT members may have set up cash collateral amounts under **different compositions**, the adequacy of the amount of **qualified default management resources** under stress conditions is tested in **3 different scenarios**.

In the **first scenario** showing the current situation, the test is conducted by

assuming that the qualified liquid assets are **only the cash TL** amounts that the members invested on the day of analysis.

In the **second scenario**, a test is performed assuming that **only half of the Cash TL** in the first scenario is in the collateral accounts of the members.

Finally, if there is a test under the relevant market rules, the scenario in which the member has **only the minimum amount of cash TL** as collateral is performed.



Liquidity Risk Stress Tests Results 2023 Q3



Liquidity Risk Stress Testing Results

1. Base Liquidity Scenario Results: Cash Equity Market

July – September 2023		Piyasalar			
Markets (Quarter Average)	Derivatives	Equity	Fixed Income	SWAP	OTC
Recourse Requirement of Largest (Two) Members Under Stress Conditions	12,754,609,340	426,903,399	1,725,451,116	1,348,539,274	83,879,204
Cash and Qualified Collateral of Largest (Two) Members	14,071,407,285	369,698,820	3,761,491,249	1,245,431,977	339,299,374
Eligible Cash and Qualified Guarantee Fund Size	1,888,629,398	145,098,850	2,016,673,827	1,256,281,320	36,089,381
Allocated Capital in Liquid Assets	354,340,400	20,977,700	85,119,200	181,972,100	5,099,900
Committed Capital in Liquid Assets	110,934,400	6,567,500	26,648,500	56,970,500	1,596,600
Total Qualified Recourses	16,425,311,483	542,342,870	5,889,932,776	2,740,655,897	382,085,255
(Qualified Liquid Recourses/Recourse Requirement)	129%	127%	341%	203%	456%



Liquidity Risk Stress Testing Results

2. Historical Liquidity Scenario Results 2001-2008 Crisis

2001		Markets	
29/09/2023	Derivatives	Equity	SWAP
Recourse Requirement of Largest (Two) Members Under Stress Conditions	21,874,967,651	1,103,951,361	2,678,351,940
Cash and Qualified Collateral of Largest (Two) Members	14,726,368,532	269,569,104	648,999,633
Eligible Cash and Qualified Guarantee Fund Size	2,062,859,666	145,594,993	1,339,571,300
Allocated Capital in Liquid Assets	354,340,400	20,977,700	181,972,100
Committed Capital in Liquid Assets	110,934,400	6,567,500	56,970,500
Total Qualified Recourses	17,254,502,998	442,709,297	2,227,513,532
(Qualified Liquid Recourses/Recourse Requirement)	79%	40%	83%

2008		Markets	
29/09/2023	Derivatives	Equity	SWAP
Recourse Requirement of Largest (Two) Members Under Stress Conditions	6,528,050,421	498,069,206	539,474,189
Cash and Qualified Collateral of Largest (Two) Members	14,726,368,532	269,569,104	648,999,633
Eligible Cash and Qualified Guarantee Fund Size	2,062,859,666	145,594,993	1,339,571,300
Allocated Capital in Liquid Assets	354,340,400	20,977,700	181,972,100
Committed Capital in Liquid Assets	110,934,400	6,567,500	56,970,500
Total Qualified Recourses	17,254,502,998	442,709,297	2,227,513,532
(Qualified Liquid Recourses/Recourse Requirement)	264%	89%	413%

Liquidity Risk Stress Testing Results

2. Historical Liquidity Scenario Results 2018-2021 Crisis

2018	Markets				
29/09/2023	Derivatives	Equity	SWAP	Fixed Income	OTC
Resource Requirement of Largest (Two) Members Under Stress Conditions	7,401,887,581	127,645,048	1,238,071,725	3,136,079,991	165,835,356
Cash and Qualified Collateral of Largest (Two) Members	14,726,368,532	269,569,104	648,999,633	3,795,353,965	364,924,022
Eligible Cash and Qualified Guarantee Fund Size	2,062,859,666	145,594,993	1,339,571,300	2,039,504,300	36,241,098
Allocated Capital in Liquid Assets	354,340,400	20,977,700	181,972,100	85,119,200	5,099,900
Committed Capital in Liquid Assets	110,934,400	6,567,500	56,970,500	26,648,500	1,596,600
Total Qualified Recourses	17,254,502,998	442,709,297	2,227,513,532	5,946,625,965	407,861,620
(Qualified Liquid Recourses/Resource Requirement)	233%	347%	180%	190%	246%

2021	Markets				
29/09/2023	Derivatives	Equity	SWAP	Fixed Income	OTC
Resource Requirement of Largest (Two) Members Under Stress Conditions	8,810,504,902	541,152,974	949,687,169	4,663,007,740	178,732,722
Cash and Qualified Collateral of Largest (Two) Members	14,726,368,532	269,569,104	648,999,633	3,795,353,965	364,924,022
Eligible Cash and Qualified Guarantee Fund Size	2,062,859,666	145,594,993	1,339,571,300	2,039,504,300	36,241,098
Allocated Capital in Liquid Assets	354,340,400	20,977,700	181,972,100	85,119,200	5,099,900
Committed Capital in Liquid Assets	110,934,400	6,567,500	56,970,500	26,648,500	1,596,600
Total Qualified Recourses	17,254,502,998	442,709,297	2,227,513,532	5,946,625,965	407,861,620
(Qualified Liquid Recourses/Resource Requirement)	196%	82%	235%	128%	228%

Liquidity Risk Stress Testing Results

2. Historical Liquidity Scenario Results 2022 Crisis

2022 29/09/2023	Markets	
	Derivatives	Equity
Recourse Requirement of Largest (Two) Members Under Stress Conditions	7,249,028,777	760,621,293
Cash and Qualified Collateral of Largest (Two) Members	14,726,368,532	269,569,104
Eligible Cash and Qualified Guarantee Fund Size	2,062,859,666	145,594,993
Allocated Capital in Liquid Assets	354,340,400	20,977,700
Committed Capital in Liquid Assets	110,934,400	6,567,500
Total Qualified Recourses	17,254,502,998	442,709,297
(Qualified Liquid Recourses/Recourse Requirement)	238%	58%





Thanks

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