



Takasbank

Credit Risk Stress Tests for CCP Markets

Central Counterparty Department



Agenda

- Introduction
 - Takasbank- CCP Risk Stress Tests
 - Takasbank Default Management Resources
 - Regulation on Risk Stress Testing
 - Local Legislation
 - International Principles
 - CPMI-IOSCO
 - Takasbank Stress Testing Model
- Stress Testing Results (**2023-3**)

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 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**.
- In this framework, Takasbank has adopted the adequacy criteria under the base-case historical scenario that the ability of the margin requirements deposited by the members and the guarantee fund contributions and the capital amount allocated by Takasbank should meet the fund requirements in the event of **default of two members with the highest risks in the market and their shareholdings**.
- **Historical base scenario** in identifying the extreme market conditions describes the scenarios based on statistical time series which represent market conditions that might happen under a higher confidence level than the one used in initial margin calculations.

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 and International 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 Directors and to the Capital Markets Board.

- 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** have defaulted **under rare but possible extraordinary stress conditions**.

Takasbank Stress Testing Model 1/3

- Stress testing is based on the **uncovered risk** amounts to which the member sare 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 Stress Testing Model 2/3

I. Base Scenarios:

- In the base scenarios used for stress testing in the Derivatives Market and Securities Lending Market to which the CCP service is provided, the extreme market conditions are depicted by the volatility calculated statistically with the past 5 years' historical data at 99.90% confidence level. Holding periods are applied as 3 days for the Derivatives Market, 2 days for the Securities Lending Market, Borsa İstanbul Money Market and Borsa İstanbul Cash Equity.

- In the base scenarios, related parameters are applied via the Historical Simulation Value at Risk Method.
 - It is observed whether total risk exposure of the two members with the highest exposure and their shareholdings which is calculated on daily basis under stress conditions is met by the default management resources of Takasbank in case of any default.

Takasbank Stress Testing Model 3/3

II. Historical Event Scenarios :

- In the historical event scenarios, the highest daily percentage changes recorded in the stock index and TRL/USD rate in 2001, 2008, 2018, 2021 and 2022 are used.
- 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 assumed resource requirement arising from the default of the two members with the highest risk exposure and their shareholdings is compared with the default management resources .



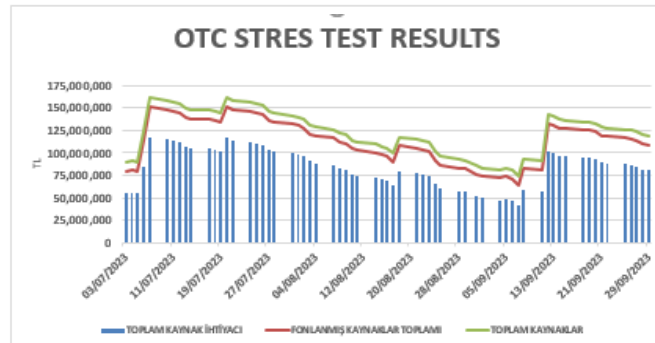
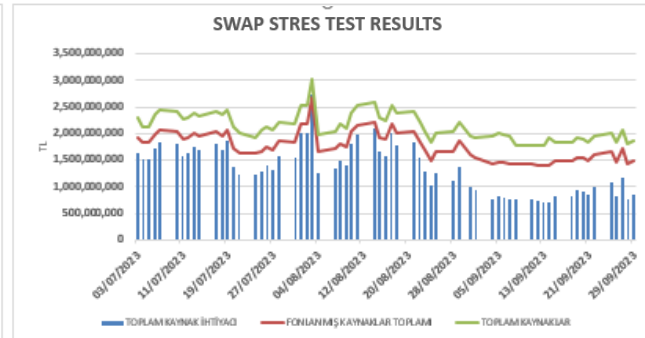
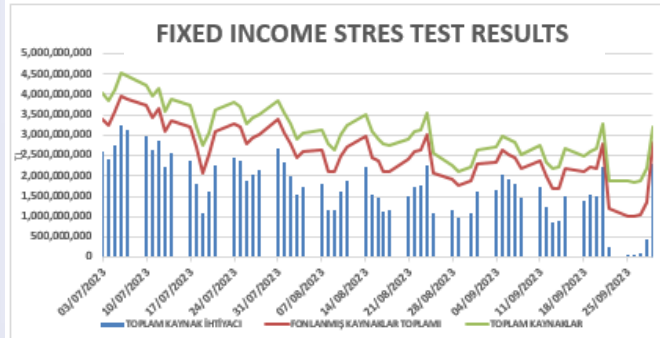
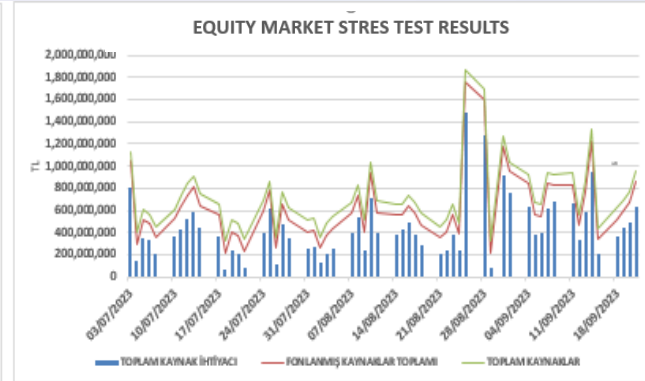
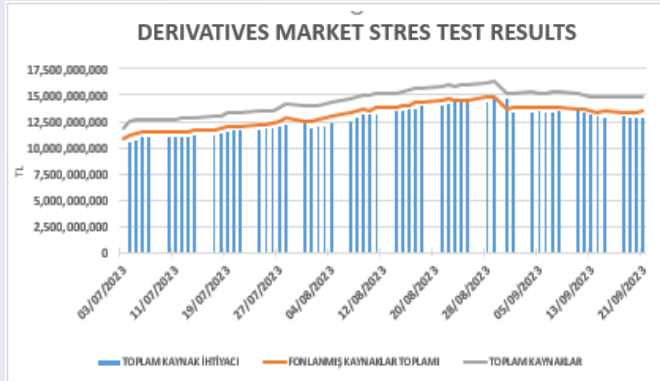
Credit Risk Stress Tests July - September 2023



1.Base Scenario Stress Testing Results:

July - September 2023		Markets			
Default Management Resources	Derivatives	Equity	Fixed Income	SWAP	OTC
Initial margin of member in default	9,279,673,659	396,993,788	1,244,941,095	799,823,294	82,096,657
Default fund contribution of the member in default	556,197,694	13,482,236	460,657,479	209,397,516	1,213,595
Dedicated capital of Takasbank for covered risks in accordance with Article No:39	354,340,400	20,977,700	85,119,200	181,972,100	5,099,900
Default fund contributions of non-defaulting members	1,335,979,476	100,819,124	526,738,351	378,284,088	9,840,026
Commitment from remaining capital of Takasbank	110,934,400	6,567,500	26,648,500	56,970,500	1,596,600
Funded Resources (I)	13,147,770,179	603,467,244	2,546,769,455	1,756,651,290	113,211,350
Additional default fund contributions of non-defaulting members	1,335,979,476	100,819,124	526,738,351	378,284,088	9,840,026
Non-funded Resources (II)	1,335,979,476	100,819,124	526,738,351	378,284,088	9,840,026
Total Resources(I+II)	14,483,749,655	704,286,368	3,073,507,806	2,134,935,379	123,051,377
Average Requirement	12,754,609,340	426,903,399	1,725,451,116	1,348,539,274	83,879,204

1.Base Scenario Stress Testing Results:



Stress Testing Results

2. Historical Stress Test Results :

July September 2023	Scenario	CCP Markets				
	Dönem	VIOP	PAY	BAP	SWAP	OTC
Margin Requirement (Average)	2001	20,904,779,188	1,103,951,361	-	3,267,341,371	-
	2008	6,238,521,344	498,069,206	-	658,108,560	-
	2018	7,073,602,481	127,645,048	3,136,079,991	1,510,332,868	165,835,356
	2021	8,419,745,458	541,152,974	4,663,007,740	1,158,530,412	178,732,722
	2022	6,927,523,200	760,621,293	-	-	-
Total Resources		14,483,749,655	704,286,368	3,073,507,806	2,134,935,379	123,051,377

Stress Testing Results

3. Reverse Stress Test Results :

29/09/2023	Number of Members Covered by Default Waterfall					Number of Members Covered by Default Waterfall (Exc. Additional DF Requirement)				
Market	Derivatives	Equity	Fixed Income	SWAP	OTC	Derivatives	Equity	Fixed Income	SWAP	OTC
2001 Crisis	1	-	-	1	-	1	-	-	-	-
2008 Crisis	12	1	-	19	-	9	1	-	19	-
2018 Crisis	6	10	1	6	-	5	8	-	3	-
2021 Crisis	5	1	-	11	-	5	1	-	7	-
2022 Crisis	8	1	-	-	-	7	-	-	-	-
Base Scenario	3	1	16	19	2	3	-	4	11	1



Sensitivity Analysis

July - September 2023		Markets			
29/09/2023	Derivatives	Equity	Fixed Income	SWAP	OTC
Total Requirement	39,684,894,666	4,390,816,320	2,775,484,274	1,190,882,048	194,723,642
New Total Requirement	40,083,923,380	4,433,372,515	2,801,821,080	1,202,790,869	196,679,488
Stress Value	399,028,714	42,556,195	26,336,806	11,908,820	1,955,846
Stress (%)	1.005%	0.97%	0.95%	1.000%	1.004%





Thanks

 + (90) 212 315 25 25

 mkt@takasbank.com.tr

 www.takasbank.com.tr

