



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 (**2018-1**)

Introduction

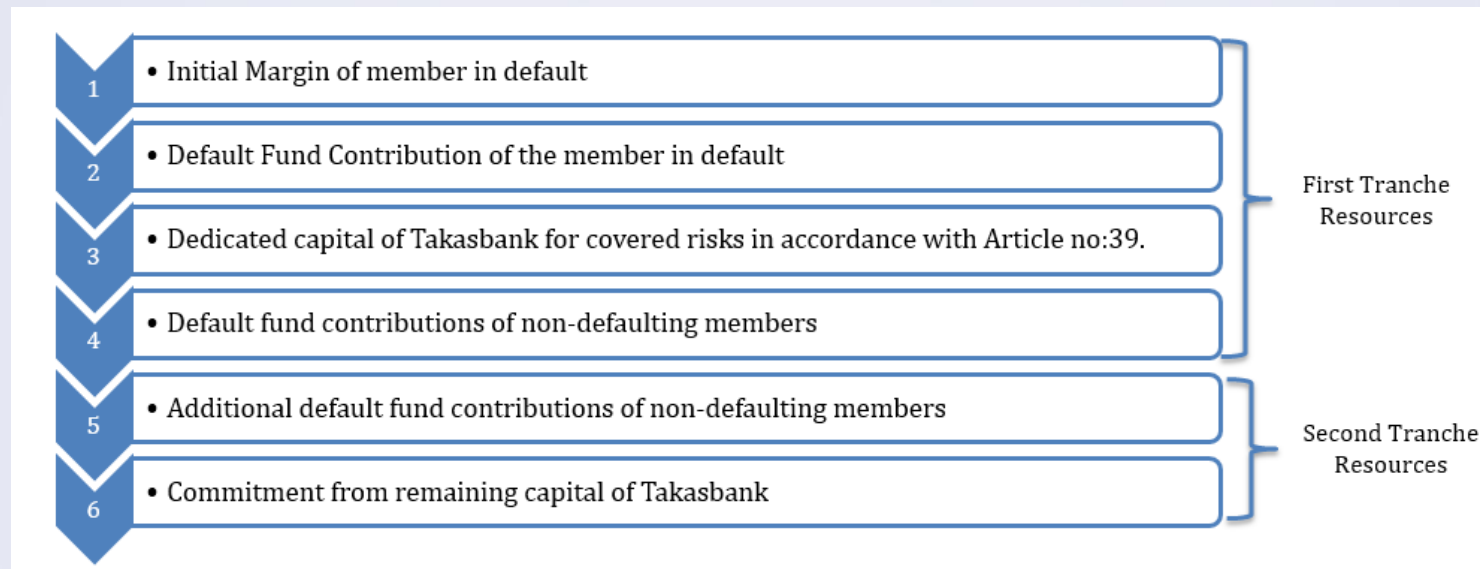
- Stress Testing, is defined as all the methods employed to evaluate the fragility of a portfolio, financial institution or the financial system under shocks and extraordinary market conditions.
- Stress tests reflect the change in market price, the shifts in the yield curve and the sudden changes that may occur in the yield and shape of this curve; the conditions whereby the assumptions made in order to measure the risk lose 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**.
- **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 shall be used in the order as below:



- The resources in the first 4 lines are classified as the **1st Tranche** 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 and the commitment from Takasbank's remaining capital are defined as **2nd tranche** in 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 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 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 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 applied in the stress testing for Derivatives Market, Securities Lending Market and Cash Equity, the highest percentage changes occurred in the stock exchange index and TRY/USD exchange between 2001 February and 2008 October have been 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 is compared with the default management resources .



Stres Tests Results

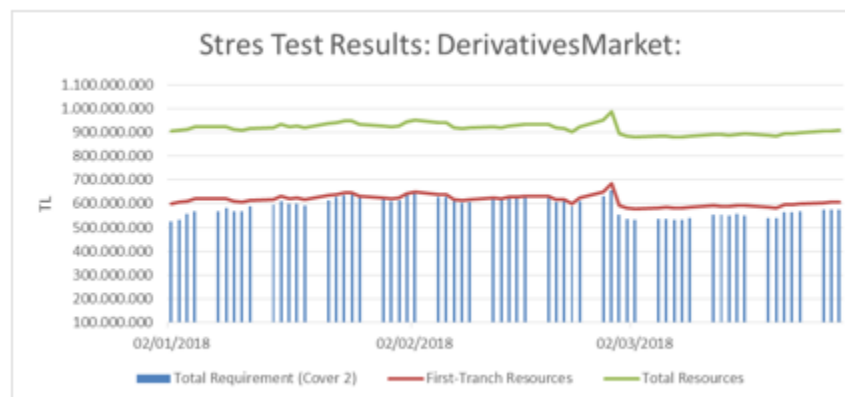
2018 Q-1



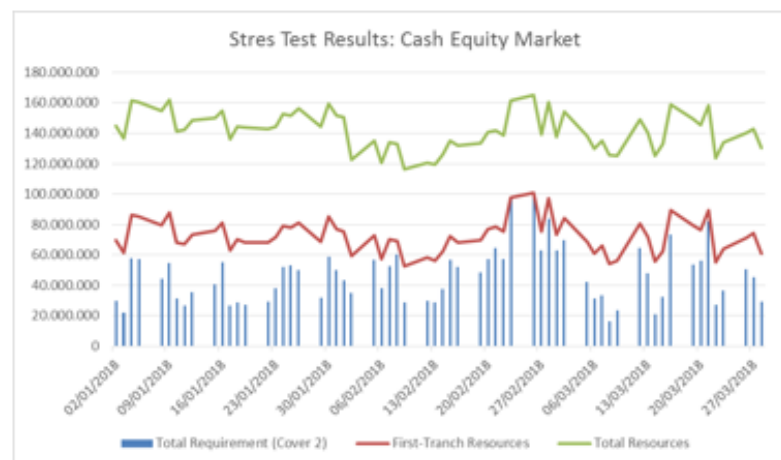
Stress Testing Results

1.Base Scenario Stress Testing Results (1/2):

Default WaterFall Resources*	
	VIOP
Initial Margin of Defaulting Members	398.644.131
Default Funds Contribution of Defaulting Members	39.044.986
Capital Allocated by Takasbank to Derivatives Market	57.425.000
Default Funds Contribution of Non-Defaulting Members	119.059.699
First-Tranch Resources	614.173.817
Contigent Default Funds Contribution of Non-Defaulting Members	119.059.699
Capital Committed by Takasbank to Derivatives Market	181.543.000
Second-Tranch Resources	300.602.699
Total Resources (I+II)	914.776.516
Average Resource Requirement	586.703.009



Default WaterFall Resources*	
	Cash Equity
Initial Margin of Defaulting Members	28.545.354
Default Funds Contribution of Defaulting Members	2.954.626
Capital Allocated by Takasbank to Cash Equity Market	13.173.362
Default Funds Contribution of Non-Defaulting Members	27.741.968
First-Tranch Resources	72.415.310
Contigent Default Funds Contribution of Non-Defaulting Members	27.741.968
Capital Committed by Takasbank to Cash Equity Market	41.646.264
Second-Tranch Resources	69.388.232
Total Resources (I+II)	141.803.542
Average Resource Requirement	46.728.716

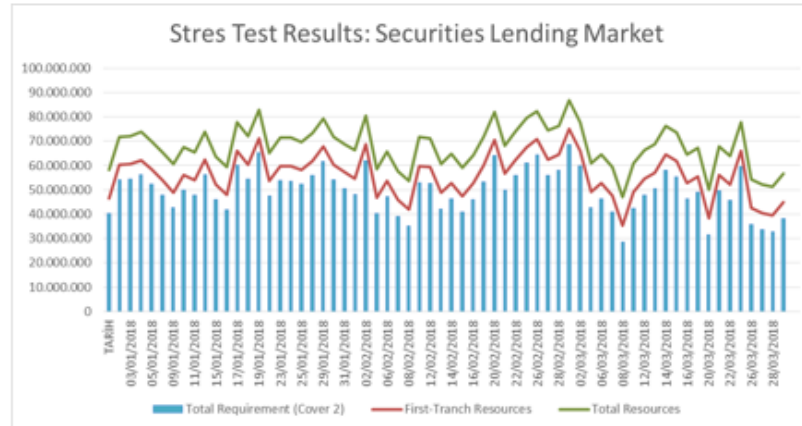


Stress Testing Results

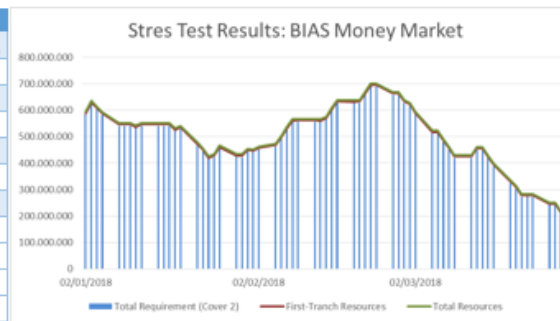
1.Base Scenario Stress Testing Results (2/2):



Default WaterFall Resources*	
	SLM
Initial Margin of Defaulting Members	49.196.272
Default Funds Contribution of Defaulting Members	1.272.516
Capital Allocated by Takasbank to Securites Lending Market	2.824.000
Default Funds Contribution of Non-Defaulting Members	2.758.891
First-Tranch Resources	56.051.678
Contigent Default Funds Contribution of Non-Defaulting Members	2.758.891
Capital Committed by Takasbank to Securites Lending Market	8.928.000
Second-Tranch Resources	11.686.891
Total Resources (I+II)	67.738.569
Average Resource Requirement	49.639.532

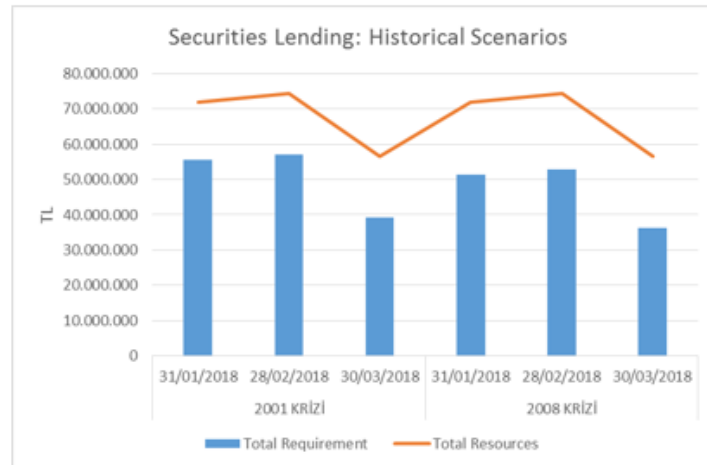
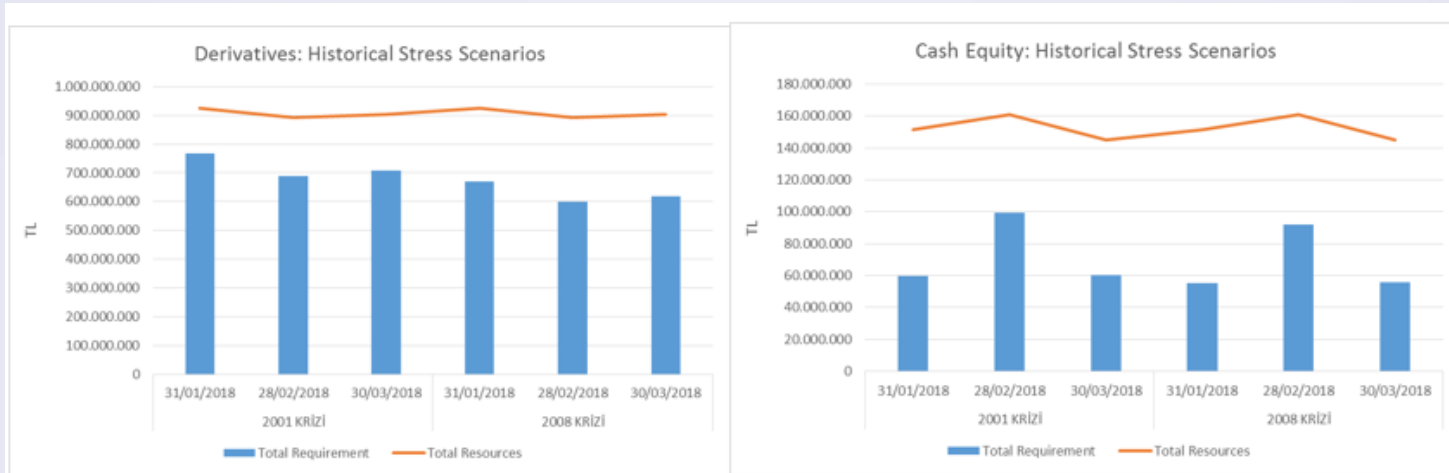


Default WaterFall Resources*	
	BIŞ Money M.
Initial Margin of Defaulting Members	486.826.840
Default Funds Contribution of Defaulting Members	2.901.406
Capital Allocated by Takasbank to Securites Lending Market	957.000
Default Funds Contribution of Non-Defaulting Members	1.902.969
First-Tranch Resources	492.588.215
Contigent Default Funds Contribution of Non-Defaulting Membe rs	1.902.969
Capital Committed by Takasbank to Securites Lending Market	3.024.000
Second-Tranch Resources	4.926.969
Total Resources (I+II)	497.515.184
Average Resource Requirement	486.841.654



Stress Testing Results

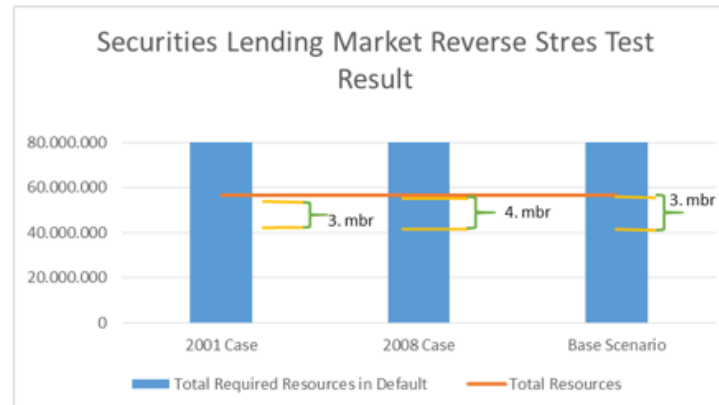
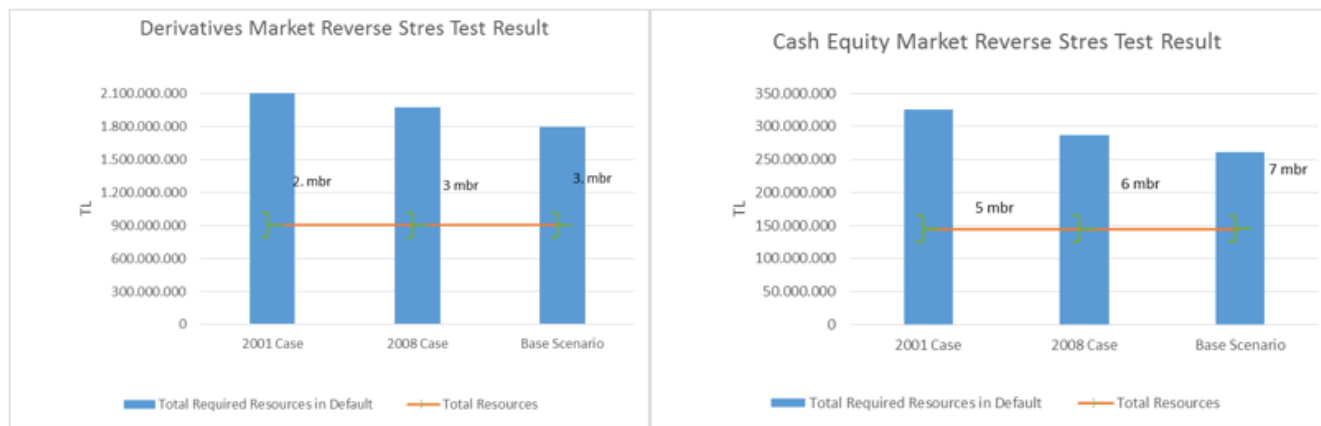
2. Historical Event Scenarios Stress Testing Results:



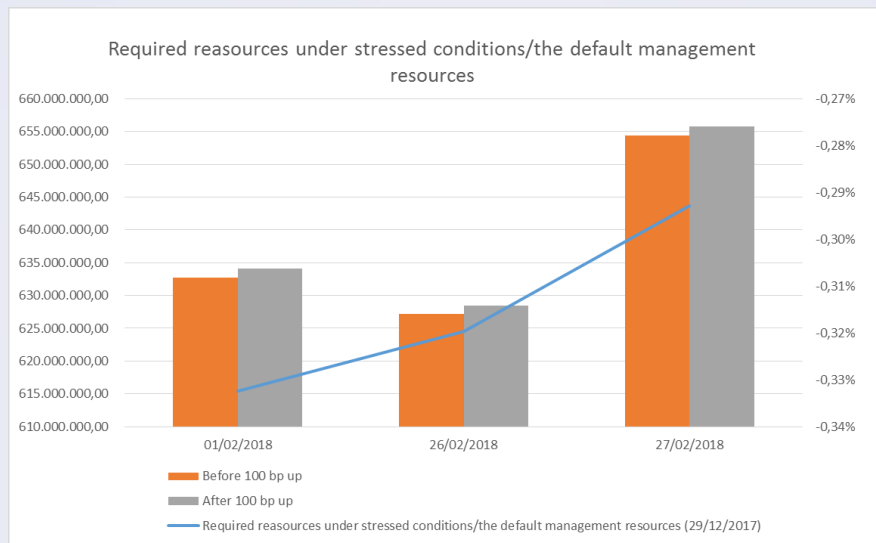
Stress Testing Results

3. Reverse Stres Test Results :

	Number of Memeber Covered by Default Waterfall			Number of Memeber Covered by Default Waterfall (Exc. Additional DF Requirement)		
	Derivatives	Equity	Sec Lend	Derivatives	Equity	Sec Lend
2001 Crisis	2	5	3	2	3	3
2008 Crisis	3	6	4	2	4	3
Base Scenario	3	7	3	2	6	3



Sensitivity Analysis



- Sensitivity analysis is conducted for Derivatives Market and it is observed that 100 bp increase in stress conditions would lower ratio of «required resources under stressed conditions»/«the default management resources» at around 0,33%, 0,32% and 0,29% respectively on the dates having the maximum open position in the market during the quarter.



Thanks

 + (90) 212 315 25 25

 mkt@takasbank.com.tr

 www.takasbank.com.tr

