



**General Letter: 1417**

**İstanbul, 11/04/2018**

**Subject:** Risk and Collateral Management Framework to be Valid at Precious Metals and Diamonds (PMD) Market After the Transition of BISTECH Stock Exchange

**Related Participants:** Banks and Precious Metal Market Institutions

Dear General Manager,

The design of the technological infrastructure development for PMD Market at Takasbank has been completed within the framework of the strategic cooperation agreement signed between Borsa İstanbul A.Ş. and NASDAQ.

Risk and collateral management, by taking the opinion of Borsa İstanbul, will be carried out by Takasbank at PMD which will be running on BISTECH system. The BISTECH system will require fundamental changes in the risk and collateral management principles being applied currently in the market. The introduction of a risk-based new collateral calculation method, the change of the methods of valuing the collateral and the asset classes accepted as collateral, and the collateral sufficiency controls are the major ones of these changes.

A guideline explaining the risk and collateral management framework that will be valid at PMD Market has been prepared so that the transition to the new system could be carried out smoothly in terms of our members. "*Risk and Collateral Management Framework to be Valid at the Precious Metals and Diamonds (PMD) Market after the Transition of BISTECH Stock Exchange*" guideline is accessible from "**Announcements and Guidelines**" section at [https://www.takasbank.com.tr/documents/CategoryDocument/PMD\\_25042018\\_2018-04-26-15-30-26.pdf](https://www.takasbank.com.tr/documents/CategoryDocument/PMD_25042018_2018-04-26-15-30-26.pdf).

You can send your related questions to [mkt@takasbank.com.tr](mailto:mkt@takasbank.com.tr).

We kindly request to be informed,

Sincerely Yours,

**TAKASBANK**  
**İSTANBUL TAKAS VE SAKLAMA BANKASI A.Ş.**

**Niyazi Burak AKAN**  
**DIRECTOR**

**Mahmut KAYACIK**  
**GENERAL MANAGER &**  
**BOARD MEMBER**



**RISK MANAGEMENT FRAMEWORK  
TO BE APPLICABLE IN THE PRECIOUS  
METALS MARKET AFTER  
BISTECH® TRANSITION**

Central Counterparty Department

April, 2018

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## I. INTRODUCTION

Risk and collateral management shall be made by Takasbank after the introduction of BISTECH system in Borsa Istanbul Precious Metals Market. This system to be operated over two different - the intra-day and end-of-day - processes, shall bring fundamental changes to the principles being implemented in the market. Transition to a new risk-based collateral calculation method, revising the methods for the assets eligible as collateral and the collateral valuation and conducting collateral adequacy controls are the leading ones among these changes.

In the Precious Metals Market, risk and collateral controls shall be performed at intra-day periods (Post-Trade Risk Management) determined by Takasbank before the trade is matched (Pre-Trade Risk Management), at the moment when the order is matched and turned to a trade (At-Trade Risk Management) and at the end of the day (End-of-Day Risk Management).

The risk management to be implemented in the Precious Metals Market shall be introduced as of May 2018. In the project to be completed on May 2018, periodic intra-day risk controls and instant risk controls shall be started.

On the other hand, end-of-day risk management shall cover the risk and collateral calculations to be made on each business day by using the prices created in the market after the designated risk calculation time.

## II. RISK and COLLATERAL MANAGEMENT APPLICATIONS

The risk calculations in Borsa Istanbul Precious Metals Market shall be made by Delta Hedge Method which employs an approach similar to SPAN. For the precious metals – gold, silver, platinum and palladium – currently traded in the market, the uniform risk calculation rules shall be used.

Upon introduction of BISTECT system, the trade positions of the precious metals traded in the precious metals market shall be monitored in a single position account without making any position and customer segregation.

Under this position account, any collateral to be deposited for the relevant assets shall be monitored in a single collateral account. As a result, there shall be only 1 collateral account of a customer in the precious metals market; and in that collateral account, the member shall maintain collateral corresponding to the risk amount of the relevant positions.

## A. Intra-Day Risk Management Applications

Intra-Day Risk Management System to be applied by Takasbank in the Precious Metals Market comprises three components. The first of them is the Post-Trade Risk Management System which includes the risk collateral calculations to be made on a periodic basis; and the other two are the Pre-Trade and At-Trade Risk Management System which shall monitor the margin adequacy in an instant manner. The functioning mechanism of the intra-day risk management applications is demonstrated in Figure-1.

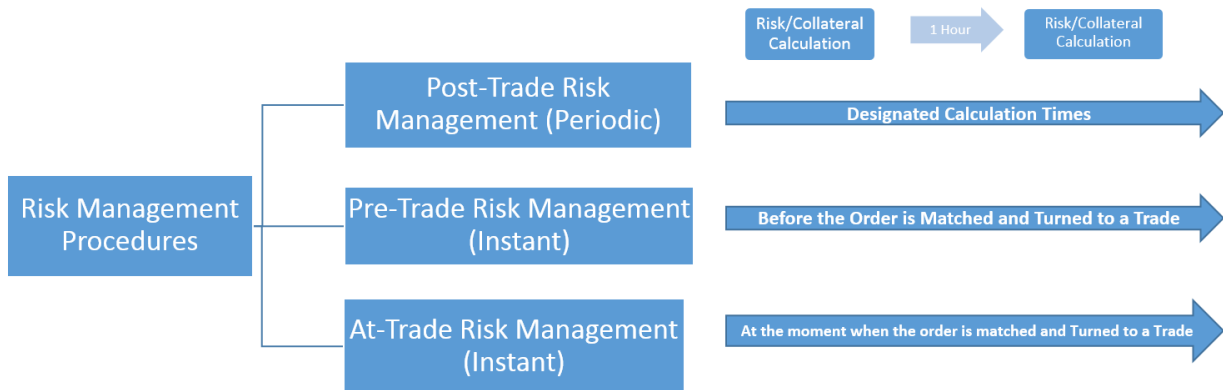


Figure 1 - Functioning mechanism of intra-day risk management applications.

### 1. Post-Trade Risk Management (Periodic)

Post-trade risk management relies on the fact that the collateral-risk compatibility is monitored with certain intervals to be designated during the day. At these designated calculation times, the prices and positions used for the trade margin calculation shall be loaded to the risk management system and collateral calculation shall be made for all accounts having a position in the system. The calculation results can be monitored from the member settlement terminals.

An intra-day margin call can be served for the accounts falling into collateral inadequacy during the day. Should collateral be failed to be deposited to the accounts for which a margin call has been served, deactivation of the member and/or application of the default provisions for the relevant Member shall be the case.

### 2. Pre-Trade Risk Management

In the pre-trade risk management, the collateral adequacy shall be sought before the order is matched and turned to a trade in the precious metals market and no collateral control shall be conducted on an order basis. Instantly available collateral information shall be given on the PTRM screens.

### 3. At-Trade Risk Management (Instant)

In the at-trade risk management, the collateral adequacy shall be calculated as at the moment when the order is matched and turned to a trade in the precious metals market. Instantly available collateral information shall be given on the PTRM screens

#### B. End-of-Day Risk Management Applications

Risk calculation and collateral valuation shall be made for all accounts by using the current risk parameters and the prices created at the end of each business day. A margin call shall be served at the end of such calculations for the accounts whose appreciated collateral amount is below the margin requirement. The collateral shall be requested to be deposited to the relevant accounts until the designated time on the next business day and any order transmission over these accounts can be prevented. Deactivation of the accounts failing to fulfill their margin call and/or application of the default provisions for the relevant member shall be the case. The functioning mechanism of the end-of-day risk management applications is demonstrated in Figure-2. .

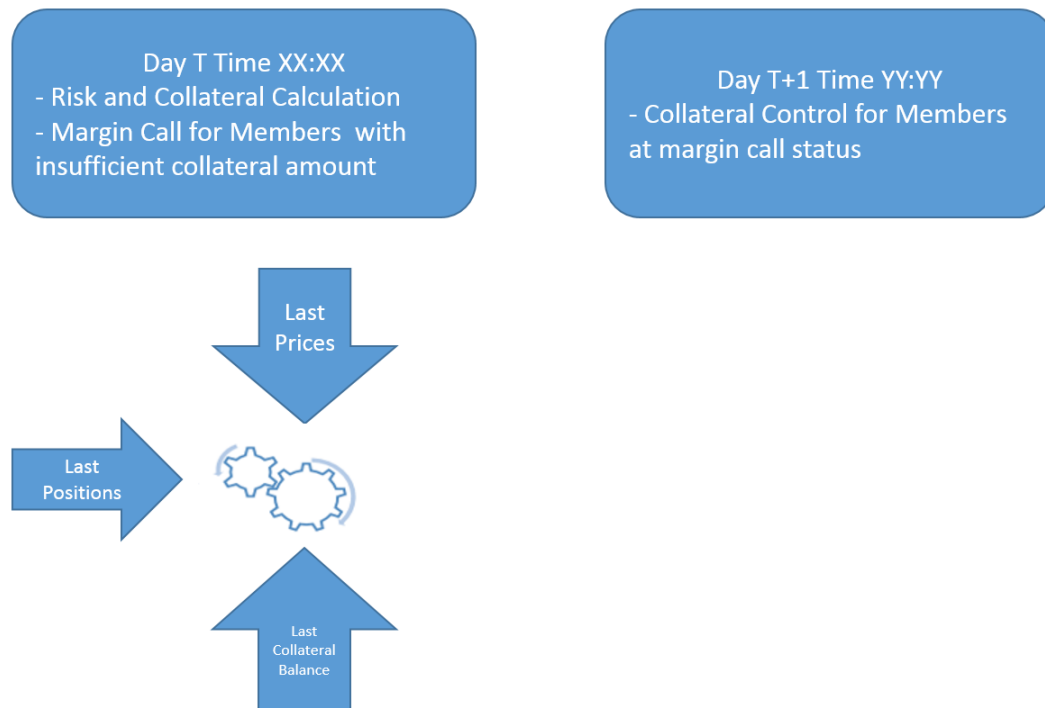


Figure 2 - Functioning mechanism of end-of-day risk management applications.

### III. NOVELTIES BROUGHT BY BISTECH RISK MANAGEMENT

Changes to be made in the current risk and collateral management applications upon introduction of the BISTECH system are shown in Figure-3 and they are going to be explained in a detailed manner in the pages ahead.



*Figure 3 - Changes introduced by BISTECH risk management.*

#### A. Collateral Calculation Method

The margin requirements in the Precious Metals Market shall be calculated based on the positions carried by the members. In this market, the position concept refers to the asset/cash receivable/debt obligations. The positions shall be generated on the T-day when the order is matched and they shall be concluded upon completion of the settlement on the T-day, T+1 day or T+X day depending on the value date of the transaction.

Collateral calculation method to be used in Borsa Istanbul Precious Metals Market has two components: the initial margin and the variation margin (bid/ask spread margin). Total margin requirement for each account with a position is composed of the sum of both of these values.

The initial margin is received at the beginning to cover, in the event the member falls into default, any price change that may occur in the Market during the time period elapsed from the moment at which the default occurs to its resolution. The initial margin to be requested for each account with a position

in the Precious Metals Market shall be calculated by using the Delta Hedge Method which has an algorithm similar to SPAN.

On the other hand, the variation margin (bid/ask spread margin) refers to the margin requirement arising up to the difference being calculated between the margin price of the price feed series constituting the base to the risk and the margin price increased or decreased according to the direction of the position. Variation margin creates an increasing impact on the total margin requirement.



Figure 4 - Total margin requirement in BISTECH system.

### 1. Calculating Margin Requirement by Delta Hedge Method

Total margin requirement is calculated by using the Delta Hedge Method in accordance with the following steps.

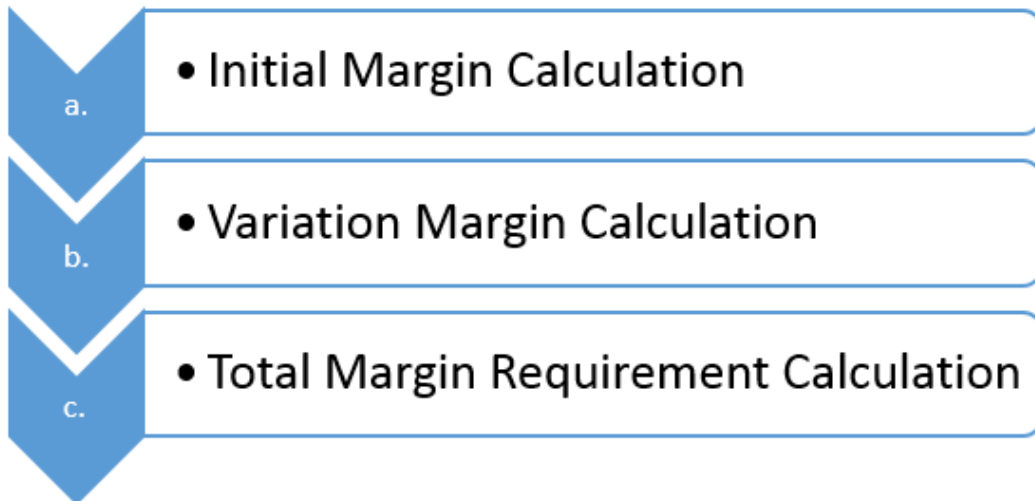


Figure 5 - Steps for calculating margin requirement by Delta Hedge Method.



### a. Calculating Initial Margin

Initial margin is the value being calculated by multiplying the relevant precious metal's total net bid/ask position subject to the settlement by the price scan range (PSR) value by the price feed serial (PFS) price on the relevant value date.

The initial margins are calculated separately for each precious metal by using the designated parameter values, and the total value is reflected as initial margin.

Initial margin is calculated by using the following formula;

$$\text{Initial Margin} = \text{Total Net Bid/Ask Positions (gr)} * \text{PSR Value (\%)} * \text{PFS Price}$$

### b. Calculating Variation Margin

Variation margin (bid/ask spread margin) is the value being calculated by multiplying the relevant precious metal's total net bid/ask position subject to the settlement by the difference between the margin price of the price feed series constituting the base to the risk and the margin price increased or decreased according to the direction of the position.

Variation margin is calculated by using the following formula;

$$\text{Variation Margin} = \text{Net Position Value (gr)} * (\text{PFS Value} - \text{B/A PFS})$$

### c. Calculating Total Margin Requirement

Total margin requirement is equal to the sum of initial margin and variation margin. In addition; when the total margin requirement is calculated, if there is any transaction for different precious metals in the relevant trades, the total margin requirement of each precious metal in itself shall be calculated and the total margin requirement shall be reflected in the relevant member for all transactions being conducted.

$$\text{Total Margin Requirement} = \text{Initial Margin} + \text{Variation Margin}$$

Note: The calculation method given in the following initial margin and variation margin calculation examples is applicable for all assets – gold, silver, platinum and palladium – in the Precious Metals Market.

Although a single price feed serial (PFS) is used in the calculations for each precious metal, the price scan range (PSR) and the bid/ask spread margin rates used in the calculations may vary according to the type of the precious metal and its value date.

**Example 1:** Let's assume that member X makes 10 units of purchase from AU\_US\_S\_995\_BI\_1KG\_T+0\_M serial and the values subject to the calculation are as follows;

*Note: If it is the same member ( a wash sale transaction), collateral shall not be exhausted.*

1 gram 1000 Carat Gold Price (PFS Price) = \$40

T+0 PSR%= 2%

Total Net Position (gr)=  $1000 * 0,995 * 10 = 9950$

Initial Margin = Total Net Position (gr)\*T+0 PSR%\*PFS Price

**Initial Margin=  $9950 * 0,02 * \$40 = \$7960$**

Bid/Ask Spread = 2%

Total Net Position (gr)=  $1000 * 0,995 * 10 = 9950$

Variation (Bid/Ask Spread) Margin = Net Position Value (gr)\*(PFS Price – B/A PFS)

*Note: Because the bid/ask spread is 2%, it shall be multiplied by PFS Price 0,98 for the bid and by 1,02 for the ask.*

**Variation Margin =  $9950 * (40 - (40 * 0,98)) = \$7960$**

Total Margin Requirement = Initial Margin + Variation Margin

**Total Margin Requirement =  $\$7960 + \$7960 = \$15920$**

**Example 2:** Let's assume that member X makes 10 units of purchase and 7 units of sale from AU\_US\_S\_995\_BI\_1KG\_T+0\_M serial and the values subject to the calculation are as follows;

*Note: Initial margin up to the net position amount shall be taken (If the amount is same, net position and initial margin shall be zero).*

1 gram 1000 Carat Gold Price (PFS Price) = \$40

T+0 % PSR = 2%

Total Net Position (gr)=  $1000 * 0,995 * (10 - 7) = 2985$

Initial Margin = Total Net Position (gr)\*T+0 % PSR \* PFS Price

**Initial Margin =  $2985 * 0,02 * \$40 = \$2388$**

Bid/Ask Spread = 2%

Total Net Position (gr)=  $1000 * 0,995 * (10 - 7) = 2985$

Variation (Bid/Ask Spread) Margin = Net Position Value (gr)\*(PFS Price – B/A PFS)

*Note: It shall be multiplied by PFS Price 0,98 for the bid and by 1,02 for the ask.*

**Variation Margin =  $2985 * (40 - (40 * 0,98)) = \$2388$**

Total Margin Requirement = Initial Margin + Variation Margin

**Total Margin Requirement =  $\$2388 + \$2388 = \$4776$**

**Example 3:** Let's assume that member X makes 1 unit of purchase from AU\_US\_S\_995\_BI\_1KG\_T+0\_M serial and 1000 units of sale from AU\_US\_S\_995\_BI\_1G\_T+0\_M serial and the values subject to the calculation are as follows;

*Note: Initial margin up to the net position amount shall be taken.*

1 gram 1000 Carat Gold Price (PFS Price) = \$40

T+0 % PSR = 2%

Total Net Position (gr) =  $(1000 * 0,995 * 1) - (1 * 0,995 * 1000) = 0$

Initial Margin = Total Net Position (gr) \* T+0 % PSR \* PFS Price

**Initial Margin =  $0 * 0,02 * \$40 = \$0$**

Bid/Ask Spread = 2%

Total Bid Position (gr) =  $1000 * 0,995 * 1 = 995$

Total Ask Position (gr) =  $1 * 0,995 * 1000 = 995$

*Note: Because purchase/sale is conducted from different series, total position shall not be netted-off for the variation margin.*

Variation (Bid/Ask Spread) Margin = Bid Position Value (gr) \* (PFS Price – Bid PFS)

Variation (Bid/Ask Spread) Margin = Ask Position Value (gr) \* (PFS Price – Ask PFS)

*Note: It shall be multiplied by PFS Price 0,98 for the bid and by 1,02 for the ask.*

**Variation Margin Bid =  $995 * (40 - (40 * 0,98)) = \$796$**

**Variation Margin Ask =  $995 * ((40 * 1,02) - 40) = \$796$**

Total Margin Requirement = Initial Margin + Variation Margin

**Total Margin Requirement =  $\$0 + \$1592 = \$1592$**

**Example 4:** Let's assume that member X makes 1 unit of purchase from AU\_US\_S\_995\_BI\_1KG\_T+0\_M and 1 unit of sale from AU\_US\_S\_995\_BI\_1KG\_T+1\_M serial and the values subject to the calculation are as follows;

*Note: Because the value dates are different, the initial margin values shall be calculated by taking the value date differences and the net position value for the above example shall be calculated over 1 KG.*

1 gram 1000 Carat Gold Price (PFS Price) = \$40

T+0 % PSR = %2, T+1 % PSR = %3

T+0 Initial Margin = Total T+0 Position (gr)\*(T+0 % PSR)\* PFS Price

T+0 Initial Margin =  $1000 * 0,995 * 40 * 0,02 = \$796$

T+1 Initial Margin = Total T+1 Position (gr)\*(T+1 % PSR)\* PFS Price

T+1 Initial Margin =  $1000 * 0,995 * 40 * 0,03 = \$1194$

**Initial Margin = T+1 Initial Margin - T+0 Initial Margin = \$398**

*Note: Because a reverse trade is conducted, the initial margin shall be up to the spread between T+0 and T+1 value initial margins.*

Bid/Ask Spread = 2%

Total Bid Position (gr) =  $1000 * 0,995 * 1 = 995$

Total Ask Position (gr) =  $1000 * 0,995 * 1 = 995$

*Note: Because purchase/sale is conducted from different series, total position shall not be netted-off for the variation margin.*

Variation (Bid/Ask Spread) Margin = Bid Position Value (gr)\*(PFS Price – Bid PFS)

Variation (Bid/Ask Spread) Margin = Ask Position Value (gr)\*(PFS Price – Ask PFS)

*Note: It shall be multiplied by PFS Price 0,98 for the bid and by 1,02 for the ask.*

**Variation Margin Bid =  $995 * (40 - (40 * 0,98)) = \$796$**

**Variation Margin Ask =  $995 * ((40 * 1,02) - 40) = \$796$**

Total Margin Requirement = Initial Margin + Variation Margin

**Total Margin Requirement =  $\$398 + \$1592 = \$1990$**

**Example 5:** Let's assume that member X makes 1 unit of purchase from AU\_US\_S\_995\_BI\_1KG\_T+0\_M and 1 unit of sale from AU\_TL\_S\_995\_BI\_1KG\_T+0\_M serial and the values subject to the calculation are as follows;

*Note: Because their characteristics except for the currencies are same, only the positions values shall be netted-off and the initial margin shall be zero.*

1 gram 1000 Carat Gold Price (PFS Price) = \$40

T+0 % PSR = %2

Total Net Position (gr)= 1000\*0,995\*(1-1)= 0

Initial Margin = Total Net Position (gr)\*T+0 % PSR \* PFS Price

**Initial Margin = 0\*(0,02)\*40= \$0**

Bid/Ask Spread = 2%

Total Bid Position (gr)= 1000\*0,995\*1=995

Total Ask Position (gr)= 1000\*0,995\*1=995

*Note: Because purchase/sale is conducted from different series, total position shall not be netted-off for the variation margin.*

Variation (Bid/Ask Spread) Margin = Bid Position Value (gr)\*(PFS Price – Bid PFS)

Variation (Bid/Ask Spread) Margin = Ask Position Value (gr)\*(PFS Price – Ask PFS)

*Note: It shall be multiplied by PFS Price 0,98 for the bid and by 1,02 for the ask.*

**Variation Margin Bid= 995\*(40- (40\*0,98))= \$796**

**Variation Margin Ask= 995\*((40\*1,02)-40)= \$796**

Total Margin Requirement = Initial Margin + Variation Margin

**Total Margin Requirement = \$0+\$1592= \$1592**

**Example 6:** Let's assume that member X makes 10 units of purchase from AU\_US\_S\_995\_BI\_1KG\_T+0\_M and 7 units of sale from AG\_US\_S\_99,9\_BI\_1KG\_T+0\_M serial and the values subject to the calculation are as follows;

*Note: Because the series belong to different assets, the initial margin shall be calculated for each asset separately.*

1 gram 1000 Carat Gold Price (PFS Price) = \$40

1 gram 100 Carat Silver Price (PFS Price) = \$0,5

T+0 Gold %PSR= %2

T+0 Silver %PSR= %3

Total Net Position Gold (gr)=  $1000 * 0,995 * 10 = 9950$

Total Net Position Silver (gr)=  $1000 * 0,999 * 7 = 6993$

T+0 Gold Initial Margin = Total Gold Position (gr)\*(T+0 Gold % PSR)\* PFS Price

T+0 Gold Initial Margin =  $9950 * 40 * 0,02 = \$7960$

T+0 Silver Initial Margin = Total Silver Position (gr)\*(T+0 Silver % PSR)\* PFS Price

T+0 Silver Initial Margin =  $6993 * 0,5 * 0,03 = \$105$

**Initial Margin = Gold Initial Margin + Silver Initial Margin = \$8065**

Bid Gold Spread= %2

Ask Silver Spread = %3

Total Bid Gold Position (gr)= 9950

Total Ask Silver Position (gr)= 6993

*Note: Because bid/ask is conducted from different asset series, total position shall not be netted-off for the variation margin.*

Gold Variation (Bid/Ask Spread) Margin = Gold Position Value (gr)\*(PFS Price - Bid PFS)

Silver Variation (Bid/Ask Spread) Margin = Silver Position Value (gr)\*(PFS Price - Ask PFS)

*Note: It shall be multiplied by PFS Price 0,98 for the gold bid and by 1,03 for the silver ask.*

**Gold Variation Margin Bid=  $9950 * (40 - (40 * 0,98)) = \$7960$**

**Silver Variation Margin Ask=  $6993 * ((0,5 * 1,03) - 0,5) = \$105$**

Total Margin Requirement = Initial Margin + Variation Margin

**Total Margin Requirement =  $\$8065 + \$8065 = \$16130$**

The price scan range of each precious metal may vary according to the value date of the relevant transaction. Delta Hedge Method takes this variation into account by using the time-dependent risk values. In this method, it is possible to differentiate the risk values of the positions to be settled on the same day (T+0) and of the positions to be settled on T+1 and/or T+X.

For example; if the PSR for the Member X's gold purchase position to be settled on T+0 day is 2% and the B/A spread rate is 3%, the PSR and the B/A spread rate for its settlement on T+1 day can be 3% and 5% respectively.

## B. Assets Eligible as Collateral and the Collateral Valuation Method

The collateral management service in the Precious Metals Market shall be provided by Takasbank. The collateral deposit-withdrawal times and the principles for valuation of collateral and assets eligible as collateral and the composition limits shall be stipulated in Takasbank regulations and procedures.

Deposited collateral shall be made subject to valuation by Takasbank. The valuation process is composed of two stages. The first of these stages is the valuation of collateral by using the current prices and collateral haircuts. The purpose of haircut application is to prevent the positions from being uncollateralized as a result of any sudden depreciation that may occur in the values of assets accepted as collateral.

The collateral value of an asset accepted as collateral by Takasbank shall be found by multiplying the current market price of the relevant asset by the haircut designated by Takasbank for that asset. The collateral haircuts shall be determined on the basis of asset type (Precious Metal, Stock, Government Domestic Debt Securities, Foreign Currency, etc.).

### **Example 1:**

10.000 USD deposited by a member in a day on which USD/TL exchange rate is 3.5 TL shall be reduced at first by the collateral valuation haircut designated by Takasbank for US Dollars. Given Calculation based on the fact that the valuation haircut is 1;

$$10.000 \text{ USD} \times 1 = 10000 \text{ USD}$$

Then, the calculated USD amount shall be converted to TL (by using the interbank foreign currency buying-selling average exchange rate at the moment the collateral is deposited or the interbank foreign currency buying-selling average exchange rate at the risk calculation times running at the beginning of each hour).

### **Example 2:**

Let's assume that a member deposits Government Domestic Debt Securities (GDDS) at the amount of 100.000 TL and the collateral valuation haircut designated for such asset is 0.91. GDDS deposited as collateral shall be valued by Takasbank by using the designated haircut and it shall be reflected in the account accordingly.

$$100.000 \times 0.91 = 91.000 \text{ TL}$$

On the other hand, the second stage of collateral valuation is the designation of total available collateral. In the Precious Metals Market, the composition of each type of asset to be provided as collateral within the total collateral can be limited. Collateral exceeding such limit shall not be taken into consideration.

Total margin requirement arising as a result of the positions being taken shall be compared to the total available collateral and any collateral surplus/collateral deficit shall result from the difference of these amounts.

$$\begin{aligned} & \text{Total collateral surplus / collateral deficit} \\ & = \text{Total available collateral} - \text{Total margin requirement} \end{aligned}$$

## IV. MEMBER SCREENS

### A. Margin Screens

#### 1. Total Margin Requirement

The level of required collateral resulting from the positions in the accounts can be seen from the total margin requirement screen. The risk amounts are displayed in US dollars.

Marjin Gereksinimi Hesabi	Marjin Hesaplaması İçin Kullanılan Hesap	Marjin Hesaplanma Zamanı	Başlangıç Marjini	Toplam Marjin	VİSlerden kaynaklı değişim marjini	Opsiyon ve Hisselerden kaynaklı Değişim marjini	Risk Para Birimi	Enstrüman Para Birimi	E/R Para Birimi
BI THL PM-MJ-P-NCCP		17.01.2018 14:00:00	-9.294,000	201.919,000			211.213,000 USD	USD	Risk

Kümülatif Toplam Marjin :	201.919,000 USD	Toplam Brüt Marjin :	-10.966,000 USD	Toplam Future Marjin :	0,000 USD	Toplam Teorik Piyasa Değeri :	0,000 USD
Toplam Başlangıç Marjini :	-9.294,000 USD	Toplam Risk Marjini Açık :	-9.294,000 USD	Toplam Opsiyon Marjin Değeri :	0,000 USD	Toplam Takas İçin Marj. Piyasa D. :	0,000 USD
Toplam VİSlerden kaynaklı değişim marjini :	0,000 USD	Toplam Risk Marjini -F.T. :	0,000 USD	Toplam F.T. Marjin Değeri :	0,000 USD	Toplam Finansal Marjin :	0,000 USD
Toplam Opsiyon ve Hisselerden kaynaklı Değişim marjini :	211.213,000 USD	Toplam Spot Marjin Değeri :	211.213,000 USD	Toplam Uzun Ops. Min Değeri :	0,000 USD	Toplam Ü. Ararasa Yayılma Kırd. :	0,000 USD
Toplam Ödeme Marjini :	0,000 USD	Toplam Forward Marjin :	0,000 USD	Toplam Ops. Priminin B. Değeri :	0,000 USD		

Figure 6 – Total Margin Requirement Screen.

#### 2. Margin Requirement Details

The security-based margin and market value figures of the positions in the account can be seen from the Margin Requirement Details screen. The cumulative values are available at the bottom of the page.

Hesap	Menkul	Marjin	Piyasa Değeri	Para Birimi	Teslimat Başlangıcı	ISIN
BI THL PM-MJ-P-NCCP	AU_SV_1000_1G	-43,000	43,000	USD		
BI THL PM-MJ-P-NCCP	AU_SV_1000_1G	-43.284,000	43.284,000	USD		
BI THL PM-MJ-P-NCCP	AU_SV_1000_1G	256.024,000	-256.191,000	USD		
BI THL PM-MJ-P-NCCP	AU_SV_1000_1G	-7.217,000	577,000	USD		
BI THL PM-MJ-P-NCCP	AU_SV_1000_1G	-3.612,000	289,000	USD		

Toplam Marjin Değeri :	201.919	USD	Toplam Piyasa Değeri :	-211.213	USD
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Figure 7 – Margin Requirement Details Screen



### 3. Margin Simulation

It demonstrates what kind of collateral calculation the system shall make against the potential portfolio structures.

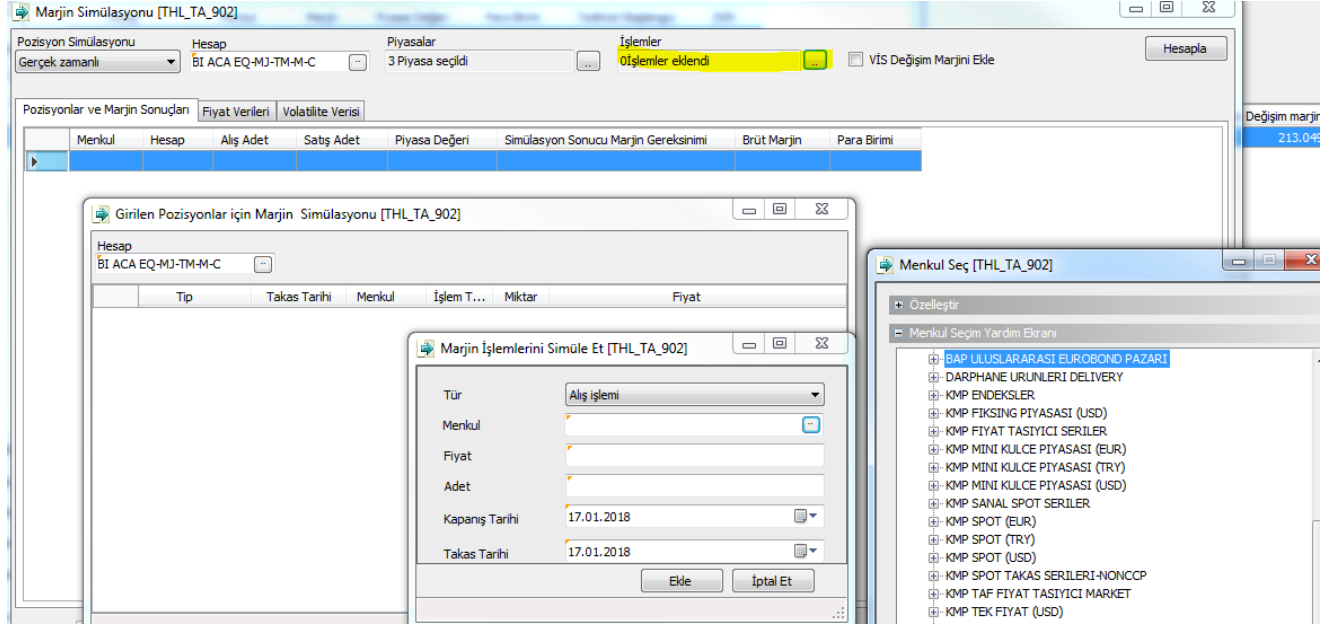


Figure 8 – Margin Simulation Screen

All risk and collateral valuation calculations to be made by Takasbank can be displayed by the members on the settlement screens. The members can enter a transaction by using their simulation menu and are able to calculate the margin requirement arising from that transaction.

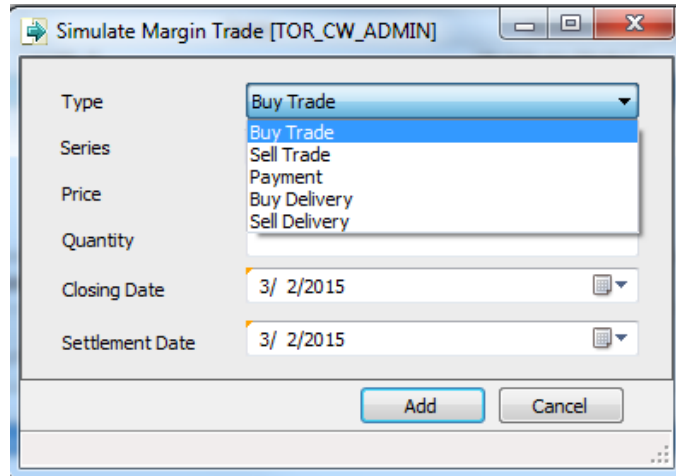


Figure 9 - Trade Generation Screen in BISTECH System.

The members can also create hypothetical portfolios by using the simulation menu. Besides that, the amount of collateral required to be deposited in case any new position is taken in addition to the outstanding ones can also be monitored through this screen.

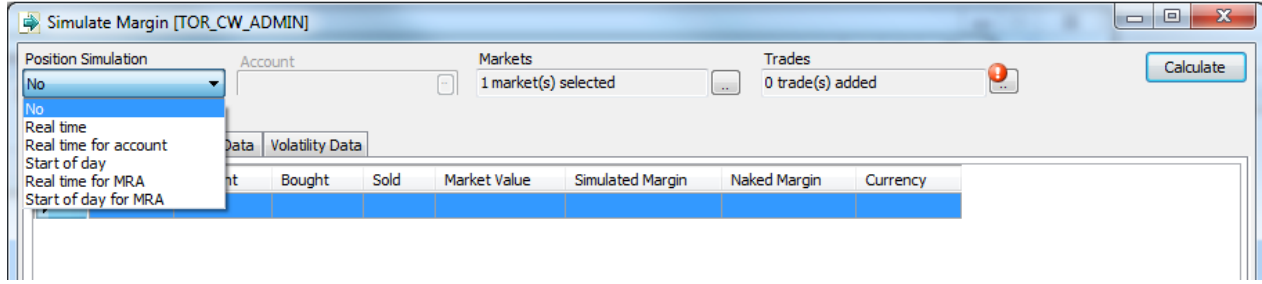


Figure 10 - Portfolio selection to be calculated in BISTECH system.

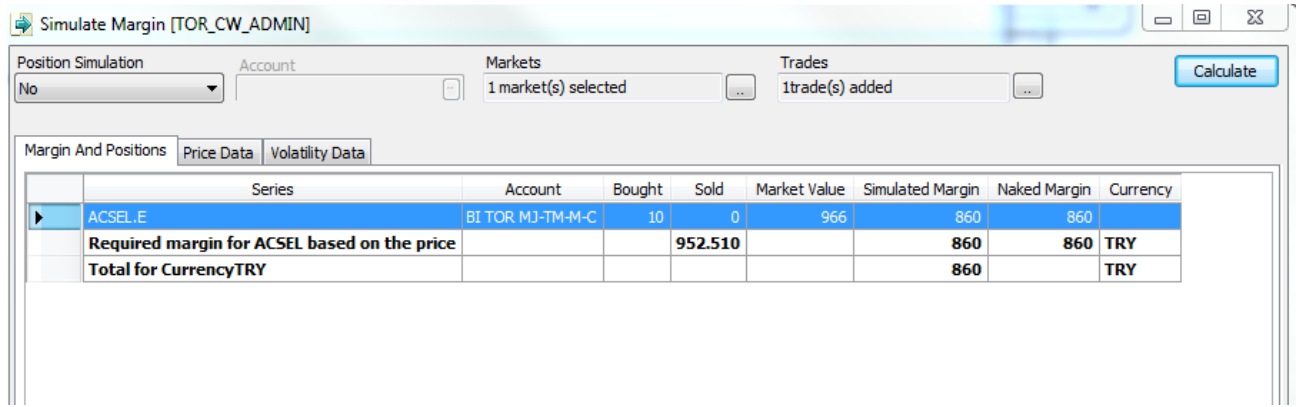


Figure 11 - Collateral simulation result screen in BISTECH system.

By the introduction of the new system, Takasbank shall begin to publish the SPAN-compatible files for the equity market. Our members who are still using the SPAN can calculate their margin requirements by using the files being published.

## B. Margin screens

Screens on which the appreciated collateral and risk values at the risk calculation times running at the beginning of each hour can be seen are given at the bottom of Collateral tab.

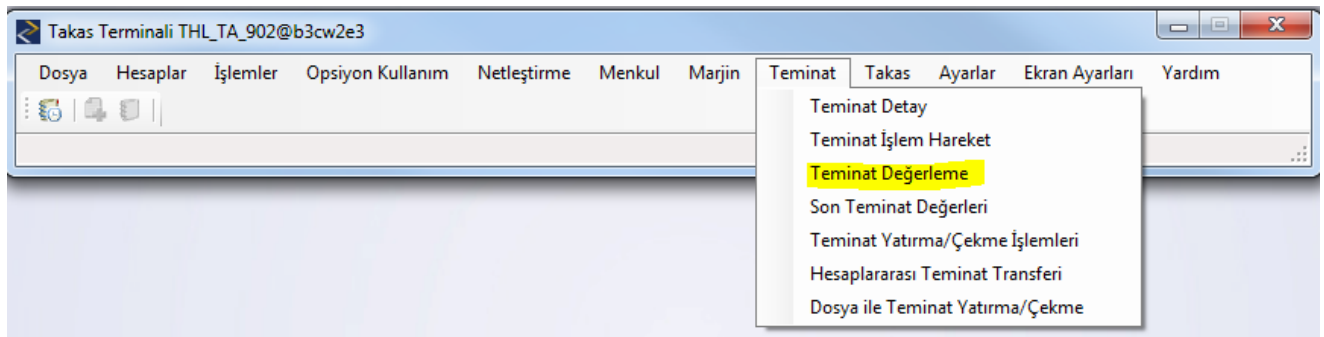


Figure 12 - BISTECH system collateral valuation screen.

Valuations related to the valuation type tab can be filtered.

Teminat Değerleme No	Teminat Durumu	Değerleme Tipi	Oluşturulma Tarihi	Gün İçi	Son	Doğrudan Borçlandırma
76	Tamamlandı	Teminat Çekme Durumunda Değerleme	16.01.2018 16:03:03	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
79	Tamamlandı	Teminat Yatırma Durumunda Değerleme	16.01.2018 16:13:12	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
80	Tamamlandı	Teminat Yatırma Durumunda Değerleme	16.01.2018 16:13:19	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1	Tamamlandı	Tüm Teminatların Değerlemesi	16.01.2018 07:15:03	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2	Tamamlandı	Tüm Teminatların Değerlemesi	16.01.2018 08:07:06	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3	Tamamlandı	Tüm Teminatların Değerlemesi	16.01.2018 09:07:08	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4	Tamamlandı	Tüm Teminatların Değerlemesi	16.01.2018 10:09:38	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5	Tamamlandı	Tüm Teminatların Değerlemesi	16.01.2018 11:12:22	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6	Tamamlandı	Tüm Teminatların Değerlemesi	16.01.2018 11:34:50	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7	Tamamlandı	Tüm Teminatların Değerlemesi	16.01.2018 11:54:06	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8	Tamamlandı	Tüm Teminatların Değerlemesi	16.01.2018 12:10:56	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9	Tamamlandı	Tüm Teminatların Değerlemesi	16.01.2018 13:09:32	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
54	Tamamlandı	Tüm Teminatların Değerlemesi	16.01.2018 14:10:50	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
55	Tamamlandı	Tüm Teminatların Değerlemesi	16.01.2018 15:00:00	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
56	Tamamlandı	Tüm Teminatların Değerlemesi	16.01.2018 15:03:39	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
70	Tamamlandı	Tüm Teminatların Değerlemesi	16.01.2018 15:38:46	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
71	Tamamlandı	Nema Dağıtım Değerlemesi	16.01.2018 15:41:00	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
78	Tamamlandı	Tüm Teminatların Değerlemesi	16.01.2018 16:07:56	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
82	Tamamlandı	Tüm Teminatların Değerlemesi	16.01.2018 17:08:19	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
85	Tamamlandı	Temerrüt Cezası Değerlemesi	16.01.2018 17:30:03	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
86	Tamamlandı	Tüm Teminatların Değerlemesi	16.01.2018 18:02:43	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
87	Tamamlandı	Kesinleşmiş Kar / Zarar Hesaplama Anı	16.01.2018 19:54:19	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
88	Tamamlandı	Tüm Teminatların Değerlemesi	16.01.2018 20:30:25	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
89	Tamamlandı	Tüm Teminatların Değerlemesi	16.01.2018 20:35:30	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
90	Tamamlandı	Hesap Güncellemesi	16.01.2018 20:38:08	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
92	Tamamlandı	Kesinleşmiş Kar / Zarar Hesaplama Anı	16.01.2018 20:54:39	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

Figure 13 - BISTECH system collateral valuation type screen.

Valuation of all collateral at the risk calculation times running at the beginning of each hour is accessible from the valuation type. To see the results, the relevant row must be right-clicked and "Display Result" must be selected.

Hesap	Değerleme tarihi	Teminat Değerleme No	Teminat Durumu	Değerleme Tipi	Oluşturulma Tarihi	Gün İçi	Son	Doğrudan Borçlandırma
BI THL PM-MJ-P-NCCP	16.01.2018	76	Tamamlandı	Teminat Çekme Durumunda Değerleme	16.01.2018 16:03:03	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
BI THL PM-MJ-P-NCCP	16.01.2018	79	Tamamlandı	Teminat Yatırma Durumunda Değerleme	16.01.2018 16:13:12	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
BI THL PM-MJ-P-NCCP	16.01.2018	80	Tamamlandı	Teminat Yatırma Durumunda Değerleme	16.01.2018 16:13:19	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
***	16.01.2018	1	Tamamlandı	Tüm Teminatların Değerlemesi	16.01.2018 07:15:03	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
***	16.01.2018	2	Tamamlandı	Tüm Teminatların Değerlemesi	16.01.2018 08:07:06	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
***	16.01.2018	3	Tamamlandı	Tüm Teminatların Değerlemesi	16.01.2018 09:07:08	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
***	16.01.2018	4	Tamamlandı	Tüm Teminatların Değerlemesi	16.01.2018 10:09:38	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
***	16.01.2018	5	Tamamlandı	Tüm Teminatların Değerlemesi	16.01.2018 11:12:22	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
***	16.01.2018	6	Tamamlandı	Tüm Teminatların Değerlemesi	16.01.2018 11:34:50	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
***	16.01.2018	7	Tamamlandı	Tüm Teminatların Değerlemesi	16.01.2018 11:54:06	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
***	16.01.2018	8	Tamamlandı	Tüm Teminatların Değerlemesi	16.01.2018 12:10:56	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
***	16.01.2018	9	Tamamlandı	Tüm Teminatların Değerlemesi	16.01.2018 13:09:32	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
***	16.01.2018	54	Tamamlandı	Tüm Teminatların Değerlemesi	16.01.2018 14:10:50	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
***	16.01.2018	55	Tamamlandı	Tüm Teminatların Değerlemesi	16.01.2018 15:00:00	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
***	16.01.2018	56	Tamamlandı	Tüm Teminatların Değerlemesi	16.01.2018 15:03:39	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
***	16.01.2018	70	Tamamlandı	Tüm Teminatların Değerlemesi	16.01.2018 15:38:46	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
***	16.01.2018	71	Tamamlandı	Nema Dağıtım Değerlemesi	16.01.2018 15:41:00	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
***	16.01.2018	78	Tamamlandı	Tüm Teminatların Değerlemesi	16.01.2018 16:07:56	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
***	16.01.2018	82	Tamamlandı	Tüm Teminatların Değerlemesi	16.01.2018 17:08:19	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
***	16.01.2018	85	Tamamlandı	Temerrüt Cezası Değerlemesi	16.01.2018 17:30:03	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
***	16.01.2018	86	Tamamlandı	Tüm Teminatların Değerlemesi	16.01.2018 18:02:43	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
***	16.01.2018	87	Tamamlandı	Kesinleşmiş Kar / Zarar Hesaplama Anı	16.01.2018 19:54:19	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
***	16.01.2018	88	Tamamlandı	Tüm Teminatların Değerlemesi	16.01.2018 20:30:25	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
***	16.01.2018	89	Tamamlandı	Tüm Teminatların Değerlemesi	16.01.2018 20:35:30	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
***	16.01.2018	90	Tamamlandı	Hesap Güncellemesi	16.01.2018 20:38:08	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
***	16.01.2018	92	Tamamlandı	Kesinleşmiş Kar / Zarar Hesaplama Anı	16.01.2018 20:54:39	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

Figure 14 - BISTECH system collateral valuation result display screen.

Risk and collateral tab in the collateral valuation result screen shows the risk and appreciated collateral status of the account at the relevant valuation time.

Marjın Hesabı	Para Birimi	Baz Para Birimi	Döviz Kuru	Toplam Marjın	Toplam Marjın (TL)	Toplam Teminat Değeri	Toplam Teminat Değeri (TL)	Eksik veya Fazla	Eksik veya Fazla (TL)
BI THL PM-MJ-P-NCCP	EUR	TRY	4,6358	0,00	0,00	9,400,00	43.576,52	9,400,00	43.576,52
BI THL PM-MJ-P-NCCP	TRY	TRY	1,000000	0,00	0,00	1.000.000,00	1.000.000,00	1.000.000,00	1.000.000,00
BI THL PM-MJ-P-NCCP	USD	TRY	3,7970	202.499,00	768.888,70	2.495.219,40	9.474.348,06	2.697.718,40	10.243.236,76
<b>BI THL PM-MJ-P-NCCP</b>		<b>TRY</b>			<b>768.888,70</b>		<b>10.517.924,58</b>		<b>11.286.813,28</b>

Figure 15 - BISTECH system risk and collateral monitoring screen.

On the instrument-based collateral value screen, the types of collateral deposited to the account and the appreciated amounts of such collateral can be seen.

Marjın Hesabı	Teminat Hesabı	Menkul	Tutar	Uygulanan Değerleme Katsayısı %	Kesintili Teminat Değeri	Kesintili Teminat Değeri (TL)	Üst Grup Limit Sonrası Teminat Değeri (TL)	Para Birim	Baz Para Birimi
BI THL PM-MJ-P-NCCP	BI THL PM-MJ-P-NCCP	AU_SD_995.0_BI_1K	60	100,0000	2.495.219,40	9.522.006,75	9.522.006,75	USD	TRY
BI THL PM-MJ-P-NCCP	BI THL PM-MJ-P-NCCP	TRYCASH	1.000.000,00	100,0000	1.000.000,00	1.000.000,00	1.000.000,00	TRY	TRY
BI THL PM-MJ-P-NCCP	BI THL PM-MJ-P-NCCP	EURCASH	10.000,00	94,0000	9,400,00	43.809,64	43.809,64	EUR	TRY

Toplam Kesintili Teminat Değeri (TL) : 10.565.816,35 TRY    Toplam Üst G. Limit Sonrası T. Değeri (TL) : 10.565.816,35 TRY    Toplam Alt G. Limiti Sonrası T. Değeri (TL) : 10.565.816,35 TRY

Figure 16 - BISTECH system instrument-based collateral value screen.

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