LINE TRADING – CONCEPTUAL MANUAL

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[B]³

SUMMARY

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CHANGES LOG:

Version	Date	Changes description
1.0	September 1st, 2017	Initial version
1.1	October 15th, 2017	1. Update on the Responsability Assignment Matrix – LINE 5.0 (chapter 6.2.1 User profiles
1.2	November 30th, 2017	1. Blocked Profile Update (Chapter 3.4.2 Blocked Profile) 2. Update on transfer of position throughout the day (chapter 4.1.7 Measure Risk) 3. Update on Account Creation and Links in SINCAD (3.3 Features and Enhancements)
1.3	December 19th, 2017	Creation of chapter 9. Error code generated by the system.
1.4	January 8th, 2018	Creation of chapter 10. Elements Not Supported by LiNe Trading
1.5	March 16th, 2018	1. Example of Risk Measure, Chapter 4.1.7 2. Addition of chapter on the Risk Measure in Protected Mode. (4.1.10 Risk Measure in Protected Mode)
1.6	May 15th, 2018	1. General change of the LINE 5.0 system name to Line Trading. 2. Removal of chapter on Central custody. (Chapter 3.5.4) 3. Removal of chapter on Allocation. (Chapter 3.5.5) 4. Removal of chapter RTC (Real Time Clearing). (Chapter 3.5.6) 5. Removal of chapter Corporate actions (Radar System). (Chapter 3.5.7) 6. Update of the infra as service in the Architecture chapter. (Chapter 3.6) 7. Conceptual update of SPCI and SPVI measures. (Chapter 4.1.2) 8. Conceptual update and examples of SDP measure. (Chapter 4.1.4) 9. Conceptual update and examples of Risk Measure. (Chapter 4.1.6) 10. Conceptual update on Protected Mode. (Chapter 4.1.7) 11. Conceptual update on Protected-mode Risk Measure. (Chapter 4.1.9) 12. Update on the user profiles of LiNe Trading (Chapter 6.2.1) 13. Inclusion of chapter on Service user. (Chapter 6.2.2)
1.7	September 09th, 2018	1. Dedicated LINE Risk Engine
1.8	November 06th, 2018	1. Conceptual update about the give up document in default profile (Chapter 3.4.1)

Line Trading – CONCEPTUAL MANUAL

[B]³

1   INTRODUCTION

LiNe Trading is a tool integrated into PUMA Trading Platform, which enables trading participants to set pre-trading limits and monitor the clients trading in the markets managed by B3 regardless the access format (DMA, Trading Desk, or Order Conveyor).

This tool version allows system users to manage it both via a web portal and via an API (Application Programming Interface), thus rendering the system usability simpler and more adaptable to each participants' trades.

It should be noted that although its use is mandatory and shows a centralized view of clients' limits, LiNe Trading tool does not replace every risk tool in the market. Therefore, assessment of the use of these market risk tools should be carried out by each participant.

With the purpose of reducing trade Execution risks, the limits set will be assessed before the order is sent to the trading engine. Such limits shall be rejected if they fail to meet the established values.

2   DEFINITIONS

The definitions below bring a few concepts needed to understand how to use LiNe Trading tool.

2.1   Clearing Member (MC)

A participant holding access authorization for settlement with the clearinghouse, in accordance with B3's specific access rules and procedures. Full Trading Participant (PNP)

A participant holding access authorization for execution of trades, according to B3's specific access rules and procedures.

2.2   Full Trading Participant (PNP)

A participant holding access authorization for execution of trades, according to B3's

specific access rules and procedures.

2.3 Trading Participant (PN)

A participant holding access authorization for the intermediation of clients' transactions and for the execution of proprietary transactions, accessing the trading environment through a full trading participant and settling its obligations through and under the responsibility of a full trading participant and a clearing member.

2.4 Settlement Participant (PL)

A participant holding access authorization to act in the clearing and settlement process, without direct access to the trading environments managed by B3 and taking the responsibility for positions and settlement of its proprietary or its customers' trades through give-ups.

2.5 Professional Traders

Traders and order conveyors are entities allowed to have limits assigned on LiNe Trading, both being under the Professional Traders category.

2.5.1 Trader

An individual who has an employment link or an independent investment agent link with a PNP, with a PN or with an institution belonging to the economic group of these participants. The trader is in charge of registering orders through a trading desk connection available to the PNP or the PN responsible for that trader and trades on those participants' trading desk.

2.5.2 Order conveyor

An individual who has an employment link or an independent investment agent link with a PNP, with a PN or with an institution belonging to the economic group of these participants. The order conveyor is in charge of registering orders through an order conveyor connection available to the PNP or the PN responsible for that order conveyor, but trades outside those participants' trading desk, including the bank

order conveyor in charge. The order conveyor will not have access to LiNe Trading, so the PN must assign permission and limits to the order conveyor.

2.6   Client

Clients are entities allowed to have limits set up on LiNe Trading and will be identified by the Individual Taxpayer Register (CPF), the Corporate Taxpayer Register (CNPJ), Code 99 (Non-resident client code based on the CVM number), or Code 88 (Non-resident client code without the CVM number).

2.7   Account

The identification of the participants' securities, trades and positions during trading, in the clearinghouse and central depositories, according to their features and status. These accounts are divided into permanent accounts (regular, error and trading error) and transitory accounts (brokerage, capture, master, admincon, fintermo, intermediary and market maker) and may present different limit consumption depending on the trade.

2.8   Links

In order to enable trading processes and the recognition of relationships between participants and their clients, links are available and can be assigned to the accounts. LiNe Trading will recognize the following links:

2.8.1   On Behalf link

The On Behalf link, referenced in this document as PCO, links two accounts of the same ownership to different participants without the client's identification of the intermediary participant (PNP, PN or PL) before the executing participant (PNP) of the On Behalf trade. This link does NOT imply the transfer of responsibility for settlement and risk management purposes among the participants involved.

The PN executing the trade must access LiNe Trading system and grant a cap limit for the intermediary PN to manage the limits of its clients and professional traders.

Information about clients and professional traders of the intermediary PN will be hidden from the executing PNP.

There is segregation of screens to manage limits for accounts with different links.

2.8.2   Give-up link

The give-up link is formed by a source account in the participant in charge of trade execution (give-up executor) and a target account in the participant that carries the client's positions (carrying participant).

Regardless of the number of PNPs (Execution Broker) the client trades in, all trading participants in the role of executors may give up to the same limit as the carrying participant.

For give-up trades, there will be two limit validations. The first validation will be done in real time when the order is entered by assessing all limits given by the PNP (Execution Broker) and by updating their positions. The second validation will be done in near time by assessing the measures of carrying participants and updating their positions.

In cases where the client violates the limit granted by the carrying participant, the document will enter into protected mode in all trading participants and the two limit assessments will be carried out in real time of the order.

In cases where the client violates the limit granted in only one PNP, the protected mode will be enabled exclusively for that PNP, while the protected mode will not be enabled for other PNPs nor for the carrying participant.

2.8.3   Options exercise link

Just like the give-up link, the options exercise link allows options registered in one participant and whose exercise implies executing a new trade to be exercised by another participant.

3   LINE TRADING SYSTEM

3.1   Who is it for?

LiNe Trading tool is intended for Full Trading Participants (PNPs), Trading Participants (PNs) and Settlement Participants (PLs) who need to set pre-trading limits for their clients. These will be the limit defining agents.

In addition, all clients who send or have their orders sent to the trading system are LiNe Trading users, since they have their limits validated before sending the order to the trading engine.

3.2   Scope

LiNe Trading tool will include the markets managed by B3 in the BM&F, BOVESPA and Private Fixed Income segments. Exception is made for the electronic spot foreign exchange market that is not part of the project scope at this stage.

3.3   Features and enhancements

A key feature of LiNe Trading architecture is that there are Risk Engines able to converge the order flow related to a client in a PNP. This brings some operational advantages over the previous system, such as the non-existence of the participant's Gateway Default and the possibility of clients and accounts trading through any trading gateway. This facilitates the distribution of participants' trading flow among more gateways, considerably mitigating trading risk.

Other LiNe Trading features include the identification of the client (through CPF, CNPJ, Code 99 or Code 88); the grouping of accounts linked to the client; and the possibility of managing limits for clients in a centralized and consolidated way. The participant may choose to set limits in the account if they wish to increase control in a granular way.

In order to meet the order flow executed through a give-up link, LiNe Trading brings the possibility of the order executing broker and the carrying broker of investors to set limits for the client.

The PNP/PN and PNP/PNP relationship for On Behalf trades are also included, with the executing participant (PNP) setting a maximum limit for each client and a maximum individual CAP limit to be distributed by the intermediary participant (PNP/PN) to clients. Although this relationship is included in the tool, the confidentiality of the intermediary institution's customer is preserved.

The integration with the BM&FBOVESPA Integrated Registration System (Sincad) will ensure that only orders from registered customers enter the trading system. This brings a point of attention to participants who create client accounts for same day trading, as they will need to ensure that the account is registered on Sincad for LiNe Trading to recognize it. As well as feature, trades are still allowed from the trading desk without the specified account, but in this case the limit of the PNP capture account will be used.

Professional Traders limits will also be considered in the new Line Trading tool, and they will be a natural replacement for the ePUMA order control upon implementation.

The possibility of profile-based management enables the setting of scalable limits, thus allowing users to group their clients by affinity (e.g., Home Broker, HFT, institutional, etc.). Therefore, all features applied to a profile will be automatically inherited by the entities existing below them. It is also possible to create exceptions in an entity belonging to a profile and, in this case, the exception will be considered regardless of the profile values.

A monitoring web portal was created to monitor the consumption of limits by entities and allow participants to follow the clients' trades while working proactively on limit management.

In order to facilitate the LiNe Trading tool management, an API with the REST (Representational State Transfer) protocol was created for integration between the users' systems and Line Trading. This web-based technology is used industry wide and makes the development of messages simpler for users. Through this interface

it is possible to extract reports, receive warning messages on consumption of pre-trading risk limits, and manage warning messages and limits.

All these changes are intended to streamline the user experience, since any and all access to B3's trading system will only be allowed through trading sessions controlled by the new LiNe Trading tool after its launch.

3.4   Profiles

To improve and speed up the management of LiNe Trading tool, the possibility of setting limits grouped by profiles was made available.

The profile allows quick and unified inheritance of all rules (limits and permissions) applied to a set of entities associated to that profile with no need to enter settings more than once.

Profiles are enabled by entities on the tool, so that a profile can only be associated with entities of the same nature (clients, accounts and professional traders). Profile segmentation by entity was a requirement to reduce complexity in defining and assessing limits.

The client and the account must necessarily be associated with a profile, and it is not possible to associate an investor/account with more than one profile. Professional traders are not required to be associated with any profile.

It is allowed to create exceptions in the original profile setup, applicable in events of specific market conditions or by assigning different values to a particular entity. The exception created does not change the value set in the profile, so that when it is deleted the set value of the profile is automatically restored.

Setting limits by instrument or group of instruments is also possible in the profile and, likewise, it can be replicated to all entities associated with the profile.

3.4.1   Default profile

Given the obligation to set limits in LiNe Trading tool, all clients who do not have a profile will automatically be associated with the default profile.

The default profile's structure is similar to other profiles, however with all limits and permissions preset to zero. If required, it is up to the participant to set limits and permissions on this profile.

The default profile is mostly applicable to automatically meet the demand of new participants' clients with no need to manage limits before placing orders.

Therefore, it is up to the participant to choose between the zeroed Default Profile, so that new entities have their trades rejected before setting customer limits, or set up the default profile risk measures, so that new entities start trading once they are created in the Investor Registration.

It should be noted that there is no Default Profile Account, since the setup of measures on the pre-trading risk tool must lie on the client. Likewise, there is no default profile for professional traders due to the greater need for professional-related control and lower maintenance compared to clients.

The documents that are to be give up and are registered in PNP participant, must be linked to a different profile of the default profile, if this is not done, Trading de Li ne rejects all offers of those documents.

3.4.2 Blocked profile

The only function for the blocked profile is to block clients from trading. This profile does not allow the administration of limits and it cannot be deleted by the trading participant.

3.5 Integrations

The pre-trading risk tool will use up information from other B3 systems, making the environment control experience for users fuller and integrated. It is important to note

that changes to the information provided by LiNe Trading external systems must necessarily be created on the information source systems. LiNe Trading access does not enable or grant access to other systems.

The following is a description of the key integrations and their uses.

3.5.1   Participant registration

The integration with the participant registration system will retrieve all PNPs, PNs, PLs and MCs registered in B3, as well as their links and segments in which they are authorized to trade.

It should be noted that updates of this registration type on the original system will be replicated on the LiNe Trading tool on the day following the change only.

3.5.2   Investor registration

Integration with the investor registration system will bring together all clients, accounts and links between them.

The registration of new accounts and clients in their source systems will be replicated on the same day on the LiNe Trading tool in an interval of up 2 minutes following maintenance in their source system. The maintenance that interferes in the limit setting dynamics (creation of give-up link, creation of On Behalf link, etc.) will also be replicated in intervals of up 2 minutes, as long as there is no trade in the source account. If there is a trade held in the source account, the link will be created on D+1.

3.5.3   Instrument registration

Os instrumentos disponíveis para a negociação estarão atualizados à medida que forem sendo criados (inclusive on-line) e associados a seus mercados autorizados, eliminando, assim, a necessidade de configurações adicionais, caso o participante utilize somente os limites agrupados. A mesma situação se aplica aos instrumentos de ofertas públicas iniciais (IPOs, na sigla em inglês), ou de leilões especiais.

3.6 Architecture

The new Line Trading system architecture was required to solve two very critical situations for participants:

- Access to the trading system by all clients through more than one gateway without restriction of account allocation;

- Centralization of limit management.

In order to enable this, a component called Risk Engine was created outside the order entry gateway. This component centralizes the entire client flow allocated to the participant and assesses the limits to then authorize the order to be sent to the trading engine. The LiNe Trading architecture also provides portal communications with risk engines, and then with gateways, if required.

The chart below shows the LiNe Trading system architecture.
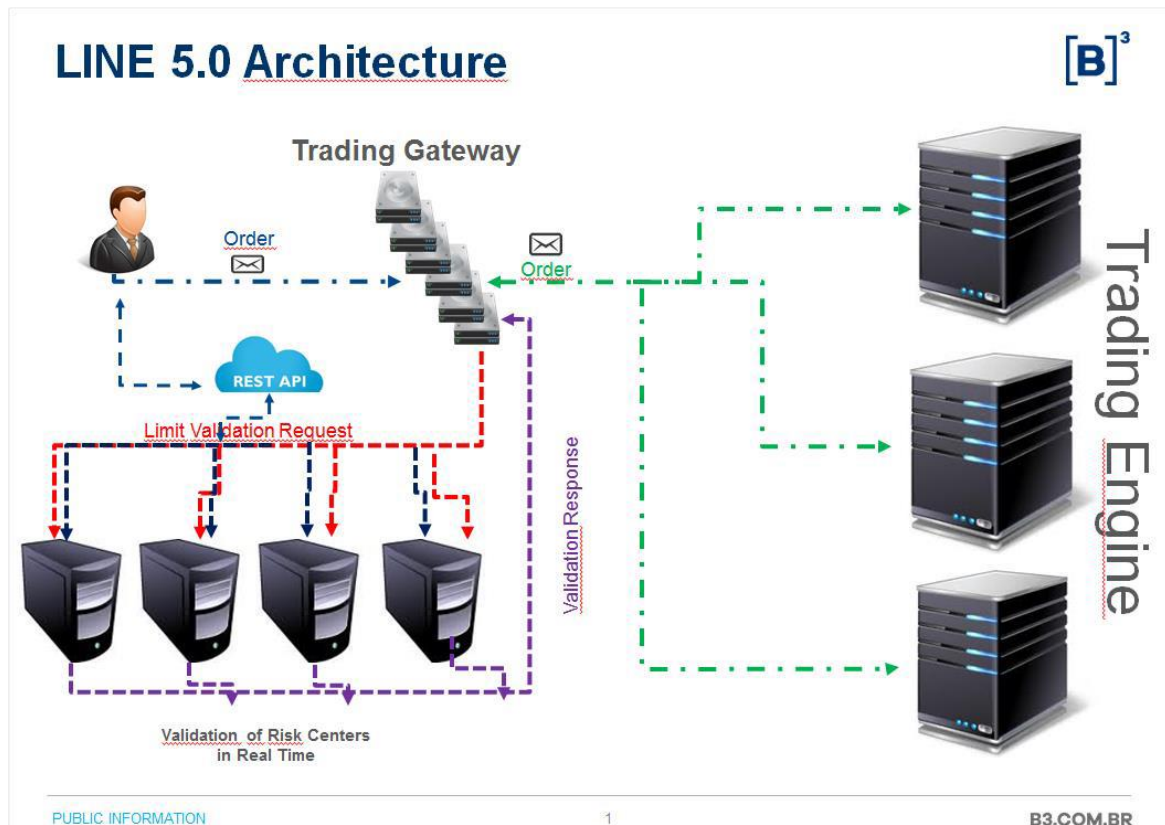
A full trading participant (PNP) must be in a single Risk Engine. This configuration is carried out by B3 and has the purpose of keeping the Risk Engines balanced, however a brokerage firm or a customer may request an exclusive Risk Engine. This service will be available in the system and more details will be available in the document (Documentation under review).

The web services provided (REST standard) will receive the requests sent by users and will update the Risk Engines, thus keeping these settings stored in the database.

For technical issues, please contact B3 Trading Support by e-mail tradingsupport@b3.com.br or by telephone at +55 11 2565-5000, option 2.

For further doubts or certification schedules, please contact B3 Trading Certification by e-mail tradingcertification@b3.com.br or telephone at +55 11 2565-5000, option 4 and 1.

4 LIMITS

The following limits are usually applicable to accounts, clients and professional traders. Although the account defines a link between a PNP and its client for trading purposes, the settlement in the Clearinghouse is done by the Clearing Member (MC) in charge of the PNP. For those cases where the PNP has two different MCs, one for each segment, although the relationship between the PNP and its MCs is unique, there will be two distinct settlement chains, according to the MC segment activity, with each set segregated in the assignment and assessment of LINE 5.0 limits as follows:

- MC BOVESPA - PNP / PN - Client - Account

- MC BM&F - PNP / PN - Client - Account

4.1 Limit types

4.1.1 Authorized markets

Authorized markets allow participants to define trading permissions of clients or other participants below their execution chain. In addition, authorized markets can work as groups for limit definitions for TMOC/TMOV and SPCI/SPVI measures, and whatever is defined in the authorized market will be valid for all instruments included in this market.

Authorized markets are broken down as follows:

Authorized Market	Description
Test Instruments	Instruments (TFs) provided by B3 to ensure infrastructure integrity on both the brokerage house and B3 sides.
IBRX-100 Index	All instruments included in the IBRX-100 index, the contracts classified in this category and their technical features can be found at: **Stocks Included in the IBRX-100 Index**
Non-IBRX-100 Index	All instruments not included in the IBRX-100 index.
IBRX-100 Options	All option instruments included in the IBRX-100 portfolio **Stocks Included in the IBRX-100 Index**
Non-IBRX-100 Options	All option instruments not included in the IBRX-100 portfolio
Private Fixed Income	All Private Fixed Income instruments, the contracts classified in this category and their technical features can be found at: **Private Fixed Income**
ETFs / FIs.	All index funds available in B3, the stocks classified in this category and their technical features can be found at: **Index and Investment Funds**
BDRs	All certificates representing securities issued and held in custody abroad and traded in B3, the contracts classified in this category and their technical features can be found at: **BDRs**
Forward	All forward instruments, the contracts classified in this category and their technical features can be found at: **Forward Instruments.**

Line Trading – CONCEPTUAL MANUAL

[B]³

Auction	All instruments with special auction features, all timelines and announcements about special auctions can be found at: Timelines and Announcements on Special Auctions
Option Exercise	All option exercise instruments
Other BOVESPA Instruments	All equity instruments not classified in any of the above categories
Gold	All gold instruments, the contracts classified in this category and their technical features can be found at: **Gold Contract**
Stock Index Futures	All instruments for stock indices (IND), rollovers (IR1) and mini-contracts (WIN), the contracts classified in this category and their technical features can be found at: **Stock Index Future Contracts**
Stock Index Options	All options arising from stock index options, the contracts classified in this category and their technical features can be found at: **Options Contract on Stock Index Futures**
Agribusiness Futures	All agricultural instruments and agricultural rollovers, the contracts classified in this category and their technical features can be found at: **Agricultural Contracts**
Agribusiness Options	All agricultural option instruments, the contracts classified in this category and their technical features can be found at: **Option Contracts on Agribusiness Futures**
Currencies	All currency, rollover and mini-currency instruments, the contracts classified in this category and their technical features can be found at: **Currency Contracts**
Other Financial Futures	The contracts classified in this category and their technical features can be found at: **Financial Futures Contracts**
Options on Other Financial Futures	The contracts classified in this category and their technical features can be found at: **Option Contract on Other Financial Futures**
Other BM&F Instruments	All derivatives instruments not classified in any of the above categories

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4.1.2   Potential short or long balance by instrument (SPVI/SPCI)

The SPCI/SPVI measure guarantees a participant's daily trade balance, one participant per instrument.

- Purpose

The SPVI/SPCI aims to establish daily maximum balances in number of contracts (Derivatives segment) or number of shares (Equity and Private Fixed Income segment) for long and short positions per instrument in each entity.

- Features

B3 will provide a maximum limit per instrument for all participants, and this amount may be changed by the participant since it does not violate the limit given by B3. When there is no such limit management (SPCI or SPVI), the limit given by B3 will be managed.

In all segments, SPCI/SPVI has a quantitative assessment obtained directly from the quantity defined in the order entry based on the number of contracts for the BM&F segment and the number of shares for the BOVESPA and Private Fixed Income segments.

Odd-lot instruments (equity) are aggregated with the corresponding underlying asset.

Option exercises are aggregated within the corresponding underlying asset.

User defined strategies (UDSs) are verified on each leg, matching the side and ledger of each leg.

It should be noted that forward instruments will be disregarded in the increase of this measure.

The measure will behave based on the entity type (client/professional trader) and the account type (permanent/transitory).

For a client, the SPCI/SPVI calculation is the function of its permanent and transitory account positions.

For a permanent account, the SPCI/SPVI calculation considers the net balances of day trades and the open bid/ask trades in the order book for that account.

For a transitory account, the SPCI/SPVI calculation considers the isolated long/short balance of day trades and the open bid/ask trades in the order book for that account.

For a trader, the SPCI/SPVI calculation uses the same transitory account rule.

Test instruments of both segments are included in the measure assessment to allow participants to perform morning tests.

For give-up trades, the limit used will be in the source account (in real time) and the target account (in near time). If there is a give-up rejected by the carrying participant, the limit consumed in the give-up target will be removed.

The SPCI and SPVI measure can show negative values (negative values indicate positions to be reversed, therefore, they "increase" the corresponding limit).

- Metrics for SPCI and SPVI measure calculation

Permanent account

$$SPCI_{CtDf}(i) = + S(i) + \sum_{j}^{N\ orders} OFC(i) + \text{ofc}$$

$$SPVI_{CtDf}(i) = - S(i) + \sum_{j}^{N\ orders} OFV(i) + \text{ofv}$$

Where:

$SPCI_{CtDf}(i)$ is the instrument's potential long balance in a permanent account;

$SPVI_{CtDf}(i)$ is the instrument's potential short balance in a permanent account;

S(i) is the instrument's balance of day trades (netting);

$\Sigma OFC(i)$ is the sum of all open bid orders;

$\Sigma OFV(i)$ is the sum of all open ask orders;

Ofc is the new bid order; and

Ofv is the new ask order.

Transitory account (capture and master example)

$$SPCI_{CtT}(i) = C(i) + \sum_{j}^{N\ orders} OFC(i) + ofc$$

$$SPVI_{CtT}(i) = V(i) + \sum_{j}^{N\ orders} OFV(i) + ofv$$

Where:

$SPCI_{CtT}(i)$ is the instrument's potential long balance in a transitory account;

$SPVI_{CtT}(i)$ is the instrument's potential short balance in a transitory account;

C(i) is the instrument's potential long balance; and

V(i) is the instrument's potential short balance.

Client

$$SPCI_{Doc}(i) = max\left[\sum_{\forall CtDf} SPCI_{CtDf}(i)\,;0\right] + \sum_{\forall CtT} SPCI_{CtT}(i)$$

$$SPVI_{Doc}(i) = max\left[\sum_{\forall CtDf} SPVI_{CtDf}(i);0\right] + \sum_{\forall CtT} SPVI_{CtT}(i)$$

Where:

$SPCI_{Doc}(i)$ is the instrument's potential long balance of a client;

$SPVI_{Doc}(i)$ is the instrument's potential short balance of a client;

$SPCI_{CtDf}(i)$ is the instrument's potential long balance in a permanent account;

$SPVI_{CtDf}(i)$ is the instrument's potential short balance in a permanent account;

$SPCI_{CtT}(i)$ is the instrument's potential long balance in a transitory account; and

$SPVI_{CtT}(i)$ is the instrument's potential short balance in a transitory account.

- Examples

a) Permanent account

Assumptions

- Holds permission and limit in the authorized market for stocks included in the IBRX-100 Index.

- Holds permission and limit in the authorized market for stocks not included in the IBRX-100 Index.

- Limit registered on the client.

- Client holds permanent accounts only.

Scenario 1

✓ Limits registered in the account.

✓ SPCI and SPVI measure set to value 400.

✓ Account long (position) in 100 shares.

✓ PETR4 instrument.

✓ Bid order in the order book with 100 quantities.

Result: SPCI measure consumption will be 75%; and the SPVI measure will be 0%.

$$75\% = 100 + \sum_{j}^{N\,orders} 100 + 100$$

$$-25\% = -100 + \sum_{j}^{N\,orders} 0 + 0$$

Note: For better understanding, the calculation used in scenario 1 above for the SPCI and SPVI measure on a client trading through a permanent account was: SPCI = 75%; and SPVI = -25%.

Scenario 2

✓ Limits registered on the client.

✓ SPCI and SPVI measure set to value 1000.

✓ Client holding one permanent account.

✓ Client short (position) in 100 shares.

✓ PETR4 instrument

✓ Bid order in the order book with 400 quantities.

✓ Ask order in the order book with 100 quantities.

✓ Sends a new ask order with the quantity of 700 shares.

Result: SPCI measure consumption will be 30%; and the SPVI measure will be 90%.

$$SPCI_{CtDf}(i) = -100 + 400 + 0$$

$$SPVI_{CtDf}(i) = +100 + 100 + 700$$

Note: For better understanding, the calculation used in scenario 2 above for the SPCI and SPVI measure trading through a permanent account was: SPCI = 30%; and SPVI = 90%.

Scenario 3

- ✓ Limits registered on the client.

- ✓ SPCI and SPVI measure set to value 1000.

- ✓ PETR4 instrument.

- ✓ Client holding two permanent accounts.

At 08:30 am, the limit was set as follows:

Client A	Values
SPCI	1000
SPVI	1000

At 10:00 am

- ✓ Client sends an ask offer with the quantity of 100 shares and closes the trade using the first permanent account (100 shares short position).

- ✓ Client sends an ask offer with the quantity of 100 shares and closes the trade using the second permanent account (100 shares short position).

- ✓ Bid order in the order book with 200 quantities in the first account.

- ✓ Ask order in the order book with 300 quantities in the first account.

- ✓ Bid order in the order book with 400 quantities in the second account.

- ✓ Ask order in the order book with 300 quantities in the second account.

The client will keep the SPCI and SPVI position split into the two final accounts.

Permanent account 1	Values
Bid Book	200
Ask Book	300
Long Position	0
Short Position	100
Balance	-100
SPCI Permanent Account 1	**100**
SPVI Permanent Account 1	**400**

Permanent account 2	Values
Bid Book	400
Ask Book	300
Long Position	0
Short Position	100
Balance	-100
SPCI Permanent Account 2	**300**
SPVI Permanent Account 2	**400**

Client's Position

Client	Calculation	Balance
SPCI	SPCI_Account 1 (100) + SPCI_Account 2 (300)	**400 (40%)**
SPVI	SPVI_Account 1 (400) + SPVI_Account 2 (400)	**800 (80%)**

New order is placed at 10:05 am:

New Order	Values
Quantity	600
Side	Bid
Permanent Account	1

Client's current balance:

Client	Calculation	Balance
SPCI	SPCI_Account 1 (700) + SPCI_Account 2 (300)	**1000 (100%)**
SPVI	SPVI_Account 1 (400) + SPVI_Account 2 (400)	**800 (80%)**

$$SPCI_{Doc}(i) = 1000$$

$$SPVI_{Doc}(i) = 800$$

Result: SPCI measure consumption will be 100%; and the SPVI measure will be 80%.

Note: For better understanding, the calculation used in scenario 3 above for the SPCI and SPVI measures comprises the use of two permanent accounts.

b) Transitory account

Assumptions

- Holds permission and limit in the authorized market for stocks included in the IBRX-100 Index.

- Holds permission and limit in the authorized market for stocks not included in the IBRX-100 Index.

- Limit registered on the client.

- Client trading on a transitory account.

<u>Scenario 1</u>

✓ Limits registered on the client.

✓ SPCI and SPVI measure set to value 1000.

✓ Client using one transitory account.

✓ Client long (position) in 400 shares.

✓ PETR4 instrument

✓ Bid order in the order book with 200 quantities of shares.

✓ Ask order in the order book with 300 quantities of shares.

✓ Sends a new bid order with the quantity of 100 shares

Result: SPCI measure consumption will be 70%; and the SPVI measure will be 40%.

4.1.3   Maximum bid and ask order size (TMOC/TMOV)

It is the maximum quantity (ticket) of bid or ask order sent to an instrument.

- Purpose

This measure aims to mitigate operational risks or limit financially (equity segment) the number of contracts (derivatives segment) for trades carried out per order on B3.

- Features

For the equity or fixed income segments, the order is assessed in financial terms. For the derivatives segment, the order is assessed in quantitative terms. The assessment is based on the instrument setup for the account or trader.

For desk trades, only the professional trader limit should be checked (even when there are settings defined for the client/account). This behavior is intended to allow large orders to be sent by professional traders without the need to change the client's limit, which would also affect the DMA trades.

For cases where the order has no price (e.g. market order), the benchmark price to be used will be defined by B3.

User defined strategies (UDSs) will have limits checked on each leg, matching the side and ledger of each leg.

Forward instruments are disregarded for purposes of this measure.

Test instruments from both segments should be assessed (each segment must comply with the rules previously described).

Option exercise instruments are disregarded for purposes of this measure.

Since the measure validation is mandatory for clients and professional traders, the absence of a set limit (directly or hierarchically) for a given instrument implies the immediate order rejection.

- Metric for TMOC and TMOV Measure Calculation

For TMOC and TMOV measure calculations, calculation will be different for the authorized Private Fixed Income, Equity and Derivatives markets.

For the authorized Private Fixed Income and Equity markets, three variables are used for calculations:

- Quantity = Number of order shares;

- Order Price = Order price sent or benchmark price; and

- PriceDivisor = Instrument price multiplication factor used for the Equity segment (value is sent on Market Data tag 37012).

For the authorized Derivatives markets, three variables are used for calculations:

- Quantity = Number of order shares;

- Order Price = Order price sent or benchmark price; and

- ContractMultiplier = Multiplication factor of the instrument price, used for the derivative segment. (value is sent on tag 231 of Market Data's SecurityList message).

Authorized Private Fixed Income and Equity markets:

- Stocks included in the IBRX-100 Index.

- Stocks not included in the IBRX-100 Index.

- Stock options included in the IBRX-100 index.

- Stocks not included in the IBRX-100 Index.

- Private Fixed Income.

- Auction, Forward.

- ETF/FI.

Calculation used in TMOC and TMOV Fixed Income and Equity metrics:

(Order Quantity (ticket) * Order or benchmark price) / PriceDivisor.

- Examples

A) Order sent to authorized stock markets included in the IBRX-100 Index and authorized stock markets not included in the IBRX-100 Index.

Assumptions

- Holds permission and limit in the authorized market for stocks included in the IBRX-100 Index.

- Holds permission and limit in the authorized market for stocks not included in the IBRX-100 Index.

- TMOC and TMOV measure set to the R$1,500.00 value.

- Client 123456 (account linked to that client 178)

- Brokerage House 700.

Scenario 1

✓ Broker 700 sends a bid order.

✓ Instrument: PETR4.

✓ Price: R$13.00.

✓ Quantity: 100.

Result: Order will be accepted. This calculation will be 100 (QTD) * 13.00 (Price) / 1 (PriceDivisor) = R$1,300.00.

Scenario 2

✓ Broker 700 sends a bid order.

✓ Instrument: TOYB3.

✓ Price: R$ 3.00.

✓ Quantity: 100,000.

Result: Order will be accepted. This calculation will be 100,000 (QTD) * 3.00 (Price) / 1000 (PriceDivisor) = R$300.00.

Scenario 3

✓ Broker 700 sends a bid order.

✓ Instrument: PETR4.

✓ Price: R$ 13.00.

✓ Quantity: 2,000.

Result: Order will be rejected. This trade calculation will be 2,000 (QTD) * 13.00 (Price) / 1 (PriceDivisor) = R$2,600.00.

Authorized markets for the Derivatives segment:

➤ Gold.

➤ Stock Index Futures.

➤ Stock Index Options.

➤ Agribusiness futures.

➤ Agribusiness Options.

➤ Currencies.

➤ Other Financial Futures.

➤ Financial Futures Options.

➤ Other BM&F Instruments.

B) Order sent to the authorized US Dollar, other financial futures and stock index futures markets.

Assumptions

- Holds permission and limit in the authorized currencies, other financial futures and futures index markets.

- TMOC and TMOV measure set to 50 for account 178 in all authorized markets.

- TMOC and TMOV measure set to 100 for RAF trader in all authorized markets.

- Client 123456 (account linked to that client 178)

- Broker 700.

Scenario 4

➢ Account 178 sends a bid order.

➢ Instrument: DOLU17.

➢ Price: 3,151.500.

➢ Quantity: 10.

Result: Order will be accepted. Order with quantity 10 is less than the limit set for client 50.

Scenario 5

➢ Account 178 sends a bid order.

➢ Instrument: DI1F21.

➢ Price: 9.300.

➢ Quantity: 40.

Result: Order will be accepted. Order with quantity 40 is less than the limit set for client 50.

> Scenario 6

➢ RAF trader sends an ask order informing the account 178.

➢ Instrument: INDV17.

➢ Price: 71,620.

➢ Quantity: 90.

Result: Order will be accepted. The RAF trader order has 90 contracts, when the order originates from a professional trader, the client or account limit validation is not assessed for the TMOC/TMOV measures.

4.1.4   Potential Debt Balance (SDP)

The SDP allows the PNP/PN/PL to limit the client's cash settlement.

- Purpose

This measure limits the investor's potential financial value to be settled, considering the operations executed on the day. It allows the financial settlement to be adjusted to the financial capacity of the investor.

- Features

It is mandatory for the PNP/PN/PL to set this limit for the client, whereas it is optional by account.

Losses are assessed on a consolidated basis for the three segments (equity, derivatives and private fixed income), according to the following:

For the equity and private fixed income segments calculation purposes:

✓ All cash instruments and options trades are included;

✓ Odd-lot instruments are included within the related primary security (instrument);

✓ Net private fixed income instruments;

✓ Options exercise are included within the related primary asset (instrument); and

✓ User defined strategies (UDSs) will have limits checked on each leg, matching the side and ledger of each leg.

For the derivatives segment calculation purposes, only option trades are considered:

✓ Options on Stock Index Futures;

✓ Options on Other Financial Futures; and

✓ Options on Agribusiness Futures.

The following instruments are disregarded in the SDP measure assessment:

✓ Private fixed income instruments with gross settlement;

✓ Forward;

✓ Test instruments;

✓ Gold;

✓ Stock Index Futures;

✓ Agribusiness Futures;

✓ Currencies;

✓ Other Financial Futures; and

✓ Other BM&F Segment Instruments.

Since the SDP measure assessment is carried out both by open orders and executed trades, the price indicated in the order, when available, is used to increase or decrease the potential cash balance (open) or the instrument's benchmark price for orders without price (mark-to-market, Market on Auction, Market on Close).

The SDP measure is formed by the balances of the executed trades and the bid orders opened in the book, however the positions of the investor in the post trading will not be contemplated to that extent.

This assessment is for clients, their related permanent and transitory accounts; and for traders and order conveyors.

Technical notation: A buy trade generates disbursement, thus it is a negative flow; a sell trade generates credit, thus it is a positive flow.

For a permanent account, the SDP calculation considers the net balances to be settled in each cycle: from cash flows to previously executed trades (post trading) and day trades, and open bid order in the order book for this account.

For a permanent, transitory account or professional trader, the SDP calculation takes into account only the negative flows, to be settled in each cycle: from financial flows to operations carried out in the day; and open purchase transactions in the order book for these entities.

For a client, the SDP calculation is the sum of SDPs of its permanent (consolidated) and transitory accounts.

The setup of this limit is mandatory for clients, i.e., the absence of limit definition (directly or hierarchically) implies in the immediate rejection of the order.

The SDP measure setup is optional for the account and for professional traders. Thus, when there is no setup for such measure by the participant, the client's SDP limit will be inherited.

When the PNP/PN reduces the registered limit of the SDP to a value lower than the client's current balance, LiNe Trading will automatically block sending new orders.

For the give-up link account, the protected mode will be activated on transactions traded by the PNP/PN that violates the limit given by the PL (carrying participant).

For cases where there is a violation of the SDP measure in the carrying, the protected mode will activated for the client and only the orders that violated this measure will be canceled, therefore the other open orders in the book that did not originate from the SDP violation will not be canceled.

- SDP Measure Calculation Metrics

Permanent account

$$SDP_{CtDf} = -\sum_{t} \min(FC_t; 0)$$

$$FC_t = +S_t + OF_{A_t} + o_t$$

$$o_t = \begin{cases} of_N; \text{if the order generates disbursement and settles in } t \\ 0; \text{otherwise} \end{cases}$$

Where:

SDP_{CtDf} is the permanent account potential debt balance;

S_t is the netting of the financial flows in the settlement cycle t, related to the transactions carried out by the account on the day (positive for receipt and negative for disbursement);

OF_{A_t} is the sum of the negative potential cash flows related to open bid orders entered by the account in the order book with settlement in t;

of_N is potential financial flow associated with the new order submitted by the account (it consumes the limit only in case the order negotiation generates financial disbursement).

Transitory account

$$SDP_{CtT} = -\sum_{t} \min(FC_t; 0)$$

Where:

SDP_{CtT} is the potential debt balance of the transitory account calculated in a way equivalent to the balance of the permanent account, where the terms S_t, OF_{A_t} and of_N consider only the financial disbursements, without compensation for the credits.

Client

The client's potential debt balance comprised of permanent and transitory accounts is calculated by the formula:

$$SDP_{DOC} = SDP_{CtDf} + \sum_{\forall CtT} SDP_{CtT}$$

Where:

SDP_{DOC} is the client's potential debt balance;

SDP_{CtDf} is the debt balance corresponding to all permanent accounts. The C_t, S_t, OF_{A_t} e of_N terms consider trade nettings in all consolidated permanent accounts; and

SDP_{CtT} is the debt balance of all transitory accounts, summed up and without netting.

Examples:

A) Permanent account

Assumptions

- Holds permission and limit in the authorized market for stocks included in the IBRX-100 Index.

- Holds permission and limit in the authorized market for stocks not included in the IBRX-100 Index.

- SDP measure set to R$1,000,000.

- Client 123456 (account linked to this client 178).

- Broker 700.

Scenario 1

At 10:15 am (current trading session)

➢ The client enters a bid order (trade) for 5,000 B3SA3 shares (D+3) at R$15,00 (R$75,000).

The SDP risk measure will be at 75,000 (7.5%).

At 10:20 am (current trading session):

➢ The client enters a bid order for 20,000 B3SA3 shares at R$15.00 (R$300,000) - Order must be open in the order book.

The SDP risk measure will be at 375,000 (37.5%).

➢ The client enters another bid order for 7,500 B3SA3 shares at R$15.00 (R$112,500).

The order is accepted and the SDP risk measure will be at 487,500 (48.75%).

Risk formula for permanent account:

$$SDP_{CtDf} = -\sum_t \min(FC_t;\ 0)$$

$$FC_t = +S_t + OF_{A_t} + o_t$$

$$o_t = \begin{cases} of_N; \text{if the order generates disbursement and settles in } t \\ 0; \text{otherwise} \end{cases}$$

Scenario summary:

Settlement Cycle	Executed trades (D0)		Open orders (book)		New order	
	Bid	Ask	Bid	Ask	Bid	Ask
D+0	-	-	-	-	-	-
D+1	-	-	-	-	-	-
D+2	-	-	-	-	-	-
D+3	R$ 75,000	-	R$ 300,000	-	R$ 112,500	-

Settlement cycle	FCt	Min (FCt, 0)
D+0	R$ 0	R$ 0
D+1	R$ 0	R$ 0
D+2	R$ 0	R$ 0
D+3	-R$ 48,.500.00	-R$ 487,500
Sum of cycles		-R$ 487,500
-1* sum	SDP:	-R$ 487,500

Result: the order will be accepted. The calculation of this trade will be SDP 48.75%.

Scenario 2

At 10:15 (current trading session):

➢ The client enters a bid order (trade) for 25,000 B3SA3 shares (D+1) at R$15.00 (R$375,000).

At 10:16 (current trading session):

➢ The client enters an ask order (trade) for 30,000 B3SA3 shares (D+3) at R$15.00 (R$450,000).

At 10:17 (current trading session):

➢ The client enters a bid order for 4,000 Options on B3SA3 (D+1) at R$15.00 (R$60,000). The order must be open in the order book.

At 10:18 (current trading session):

➢ The client enters a bid order for 4,500 B3SA3 shares (D+3) at R$15.00 (R$67,500). The order must be open in the order book;

➢ The client enters another bid order for 500 B3SA3 shares at R$15.00 (R$7,500).

Risk formula for permanent account:

$$SDP_{CtDf} = -\sum_{t} \min(FC_t;\ 0)$$

$$FC_t = +S_t + OF_{A_t} + o_t$$

$$o_t = \begin{cases} of_N; \text{if the order generates disbursement and settles in } t \\ 0; \text{otherwise} \end{cases}$$

Scenario summary:

Settlement cycle	Executed trades		Open orders (book)		New order	
	Bid	Ask	Bid	Ask	Bid	Ask
D+0	-	-	-	-	-	-
D+1	R$ 375,000	-	R$ 60,000	-	-	-
D+2	-	-	-	-	-	-
D+3	-	R$ 450,000	R$ 67,500	-	R$ 7,500	-

Settlement cycle	FCt	Min (FCt, 0)
D+0	R$ 0	R$ 0
D+1	- R$ 435,000	-R$ 435,000
D+2	R$ 0	R$ 0

D+3	R$375,000	R$ 0
Sum of cycles		-435,000
-1* Sum	SDP:	-435,000

Result: The order will be accepted. The calculation of this trade will be SDP 43.50%.

B) Transitory account

Assumptions

- Holds permission and limit in the authorized market for stocks included in the IBRX-100 Index.

- Holds permission and limit in the authorized market for stocks not included in the IBRX-100 Index.

- SDP measure set to R$1,000,000.

- Client 123456 (account linked to this client 178)

- Broker 700.

Scenario 1

At 10:15 am (current trading session):

➢ The client enters a bid order (trade) for 5,000 B3SA3 shares (D+1) at R$15.00 (R$75,000).

➢ The client enters an ask order (trade) for 100 Options on B3SA3 (D+1) at R$15.00 (R$1,500).

At 10:16 am (current trading session):

➢ The client enters a bid order (trade) for 7,000 B3SA3 shares (D+3) at R$15.00 (R$105,000).

At 10:17 am (current trading session):

➢ The client enters a bid order for 4,000 Options on B3SA3 (D+1) at R$15.00 (R$60,000). The order must be open in the order book.

    At 10:18 am (current trading session):

➢ The client enters a bid order for 4,500 B3SA3 (D+3) shares at R$15.00 (R$67,500). The order must be open in the order book.

➢ The client enters another ask order for 100 B3SA3 shares (D+3) at R$15.00 (R$1,500).

➢ The client enters another bid ask order for 1,500 B3SA3 shares at R$15.00 (R$22,500).

Risk formula for transitory account:

$$SDP_{CtT} = -\sum_t \min(FC_t;\ 0)$$

Scenario summary:

Settlement cycle	Executed trades		Open orders (book)		New order	
	Bid	Ask	Bid	Ask	Bid	Ask
D+0	-	-	-	-	-	-
D+1	R$ 75,000	R$ 1,500	R$ 60,000	-	-	-
D+2	-	-		-	-	-
D+3	R$ 105,000	-	R$ 67,500	R$ 1,500	R$ 22,500	-

Settlement cycle	FCt	Min (FCt, 0)
D+0	R$ 0	R$ 0
D+1	-R$ 135,000	-135,000
D+2	R$ 0	R$ 0
D+3	-R$ 195,000	-R$ 195,000
Sum of cycles		-R$ 330,000
-1* sum	**SDP:**	**-R$ 330,000**

Result: The order will be accepted. The calculation of this trade will be SDP 33%.

C) Client trading through two permanent accounts

Assumptions

- Holds permission and limit in the authorized market for stocks included in the IBRX-100 Index.

- Holds permission and limit in the authorized market for stocks not included in the IBRX-100 Index.

- SDP measure set to R$1,000,000.

- Client 123456 (accounts linked to this client 111 and 222)

- Broker 700.

Scenario 1

At 10:20 am (current trading session) - Account 111:

➢ The account 111 enters a bid (trade) for 5,000 Options on B3SA3 (D+1) at R$15.00 (R$75,000).

At 10:20 am (current trading session):

➢ The account 111 enters a bid (trade) for 7,000 B3SA3 shares (D+3) at R$15.00 (R$105,000).

At 10:25 (current trading session) - Account 222:

➢ The account 222 enters an ask (trade) for 4,000 Options on B3SA3 (D+1) at R$15.00 (R$60,000).

At 10:30 (current trading session):

The account 222 enters an ask (trade) for 40,000 B3SA3 shares (D+1) at R$15.00 (R$600,000). The order must be open in the order book.

At 10:35 am (current trading session) - Account 111:

➢ The account 111 enters a bid (trade) for 3,000 Options on B3SA3 (D+1) at R$15.00 (R$45,000). The order must be open in the order book.

At 10:40 (current trading session):

➢ The account 111 enters an ask (trade) for 2,000 B3SA3 shares (D+1) at R$15.00 (R$30,000). The order must be open in the order book.

At 10:45 (current trading session) - Account 222:

➢ The account 222 enters a bid (trade) for 1,000 Options on B3SA3 (D+1) at R$15.00 (R$15,000). The order must be open in the order book.

At 10:50 (current trading session) - Account 111:

➢ The account 111 enters another bid (trade) for 2,500 B3SA3 shares at R$15.00 (R$37,500).

Risk formula for cliente assessment:

$$SDP_{DOC} = SDP_{CtDf} + \sum_{\forall CtT} SDP_{CtT}$$

Scenario summary (account 111):

Settlement cycle	Executed trades		Open orders (book)		New order	
	Bid	Ask	Bid	Ask	Bid	Ask
D+0	-	-	-	-	-	-
D+1	R$ 75,000	-	R$ 45,000	-	-	-
D+2		-		-	-	-
D+3	R$ 105,000	-	R$ 30,000	-	R$ 37,500	-

Scenario summary (account 222):

Settlement cycle	Executed trades		Open orders (book)		New order	
	Bid	Ask	Bid	Ask	Bid	Ask
D+0	-	-	-	-	-	-
D+1	-	R$ 60,000	-	-	-	-
D+2	-	-	-	-	-	-
D+3	-	R$ 600,000	R$ 15,000	-	-	-

Account 111 summary:

Account	Settlement cycle	FCt	Min (FCt, 0)
Account 111	D+0	R$ 0	R$ 0
Account 111	D+1	-R$ 120,000	-R$ 120,000
Account 111	D+2	R$ 0	R$ 0
Account 111	D+3	-R$ 170,500	-R$ 170,500
Sum of cycles			-R$ 290,500
-1* Sum		SDP:	-R$ 290,500

Account 222 summary

Account	Settlement cycle	FCt	Min (FCt, 0)
Account 222	D+0	R$ 0	R$ 0
Account 222	D+1	R$ 60,000	R$ 0
Account 222	D+2	R$ 0	R$ 0
Account 222	D+3	R$ 545,000	R$0
Sum of cycles			R$ 0
-1* Sum		SDP:	R$ 0

Client balance:

Client	SDP	Balance
123456	29.50%	R$ 290,500

4.1.5   Day trade cash balance (SFD)

The SFD is a risk measure that limits the financial loss on day trades.

- Purpose

To limit stop loss on day trading and mitigate risks associated with automated trading systems.

- Features

This limit is set by the PNP/PN/PL being mandatory for the client, and optional for the account. The limit is assessed regardless of the nature of the order sent by the investor, be it a trading desk or a DMA trade.

Losses are assessed in a consolidated manner for both segments together (equity and derivatives).

For calculation purposes:

- Odd-lot instruments (equity) should be included within the related underlying asset (security);

- Options exercise should be disregarded;

- Forward instruments (equity) should be disregarded;

- Test instruments for both segments should be disregarded; and

- User defined strategies (UDSs) should have their limits checked on each leg, considering the side and the ledger of each leg.

This assessment is in place for clients, their associated permanent and transitory accounts; and for Professional Traders.

For a permanent or transitory account, the SFD calculation considers the traded security feature, the quantity and the price of each executed trade (by security) in that account. It should be noted that losses are assessed by consolidating the net balance, either positive or negative, of each instrument traded in the account (instead of considering instruments with losses only).

For mini-contracts, the SFD risk measure will aggregate all trades executed together with their associated "large" instruments. Therefore, the tool will be able to calculate arbitrage trades, for instance.

For a client, the SFD calculation is the sum of the SFDs of its permanent and transitory accounts.

For a Professional Trader, the SFD calculation uses the same transitory account rule.

This limit setup is mandatory for the client, which means that the lack of a set limit (directly or hierarchically) would imply the immediate order rejection.

This limit setup is optional for the account, which means that the risk assessment is always performed (since it is used by the client), but its validation is subject to the limit definition (directly or hierarchically).

This limit setup is optional for Professional Traders, which means that the risk assessment is always performed, but its validation is subject to the l definition (directly or hierarchically). When there is a violation of this SFD risk measure, the protected mode for the professional will be activated, however, the orders will not be canceled. It should be noted that there is not SPI position for professional traders. Therefore, this professional will not be allowed to trade until the SFD limit ia increased and the protected mode, disabled.

For questions on financial calculations of derivatives, equity or fixed income, B3 provides a webpage with all information and calculations on its traded products: http://www.bmfbovespa.com.br/pt_br/produtos/listados-a-vista-e-derivativos/juros/futuro-de-cupom-cambial-de-depositos-interfinanceiros-de-um-dia.htm#

- SFD measure calculation metrics

Permanent account

$$SFD_{CtDf} = -\min\left[\left(\sum_{\forall i}\min(qtdeV_i; qtdeC_i)\times(pmV_i - pmC_i)\times M_1\times M_2\right); 0\right]$$

Where:

SFD_{CtDf} is the day trade cash balance of the permanent account;

$qtdeV_i$ is the sum of quantities of shares/contracts in sell trades of the i instrument in the account;

$qtdeC_i$ is the sum of quantities of shares/contracts in buy trades of the i instrument in the account;

pmV_i is the average i instrument sell price in the account;

pmC_i is the average i instrument buy price i in the account;

M_1 e M_2 are multipliers (if applicable) for each i instrument, according to the provisions of the contract specification for each instrument.

<u>Transitory account</u>

Although there is no clearing, in the calculation of the SFD measure, the conservative treatment considers that the allocation of all trades will occur in a single client. Therefore, we have:

$$SFD_{CtT} = -\min\left[\left(\sum_{\forall i}\min(qtdeV_i; qtdeC_i)\times(pmV_i - pmC_i)\times M_1\times M_2\right); 0\right]$$

Where:

SFD_{CtT} is the day trade cash balance of the transitory account;

$qtdeV_i$ is the sum of quantities in sell trades of the i instrument in the account;

$qtdeC_i$ is the sum of quantities in buy trades of the i instrument in the account;

pmV_i is the average i instrument sell price in the account;

pmC_i is the average i instrument buy price in the account;

M_1 e M_2 are multipliers (if applicable) for each i instrument, according to the provisions of the contract specification for each instrument.

Client

The client's day trade cash balance composed of permanent and transitory accounts is calculated by the formula:

$$SFD_{DOC} = \sum_{\forall CtDf} SFD_{CtDf} + \sum_{\forall CtT} SFD_{CtT}$$

Where:

SFD_{DOC} is the client's day trade cash balance.

- Examples

A) Definitve account

Assumptions

- Holds permission and limit in all authorized markets.

- SFD measure set to value R$1,000,000.

- Client 123456 (accounts linked to this client 178 and 179).

- Broker 700.

Scenario 1

Trading VALE5 – Account 178:

➢ The client enters a bid (trade) for 100 shares at R$25.00;

➢ The client enters a bid (trade) for 200 shares at R$24.00;

➢ The client enters a bid (trade) for 300 shares at R$23.00;

➢ The client enters a bid (trade) for 400 shares at R$22.00;

➢ The client enters an ask (trade) for 100 shares at R$20.00;

➢ The client enters an ask (trade) for 200 shares at R$19.00.

Risk formular for client assessment:

$$SFD_{CtDf} = - \min\left[\left(\sum_{\forall i} \min(qtdeV_i; \, qtdeC_i) \times (pmV_i - \, pmC_i) \times M_1 \times M_2\right); 0\right]$$

Scenario summary

Instrument	Buy Qty	Buy Price	Sell Qty	Sell Price
VALE5	100	R$ 25.00	100	R$ 20.00
VALE5	200	R$ 24.00	200	R$ 19.00
VALE5	300	R$ 23.00		
VALE5	400	R$ 22.00		
Number of traded shares	1		300	
Minimum between buy and sell		**300**		

Description	Values
Buy volume (Buy Qty * Buy Price)	R$ 23,00
Sell volume (Sell Qty * Sell Price)	R$ 5,800.00
pmVi (5,800/300) Sell volume/Sell Qty	R$ 19.33
PmCi (R$23,000/1000) Buy volume/Buy Qty	R$ 23.00
pmVi – pmCi	-R$ 3.67
M1	1
M2	1
Instrument	**-R$ 1,101.00**
SFD	**R$ 1,101.00**

$$1{,}100.00 = -\min\left[\left(\sum_{\forall i} \min(300_i; \ 1{,}000) \times (19.33 - 23.00) \times 1 \times 1\right); 0\right]$$

Result: The order will be accepted. This SFD risk measure calculation will be 0.11% for account 178.

Scenario 2

Mini-Contract (WDO) trading, account 179:

➢ Client buys (trade) 625 contracts at R$3,140.00;

➢ Client buys (trade) 625 contracts at R$3,141.00;

➢ Client buys (trade) 625 contracts at R$3,139.00;

➢ Client buys (trade) 1,250 contracts at R$3,138.00.

US Dollar Contract (DOL) trading:

➢ Client sells (trade) 125 contracts at R$3,130.00;

➢ Client sells (trade) 125 contracts at R$3,125.00;

➢ Client sells (trade) 125 contracts at R$3,136.00;

➢ Client sells (trade) 250 contracts at R$3,138.00.

Scenario summary:

Instrument	M1	M2
WDO	10	1
DOL	50	1

Instrument	Buy Qty	Buy Price	Qty (c/ M1)	Price (c/ M2)
WDO	625	3,140.00	(625*10) 6,250	3,140.00
WDO	625	3,141.00	(625*10) 6,250	3,141.00
WDO	625	3,141.00	(625*10) 6,250	3,141.00

WDO	1250	3,138.00	(625*10) 12,500	3,138.00
Number of traded contracts	**_3,125_**		**31,25**	

Instrument	Sell Qty	Sell Price	Qty (v/ M1)	Price (v/ M2)
DOL	125	3,130.00	(125*50) 6,250	3,13
DOL	125	3,125.00	(125*50) 6,250	3,125
DOL	125	3,136.00	(125*50) 6,250	3,136
DOL	250	3,138.00	(250*50) 12,500	3,138
Number of traded contracts	**_625_**		**31,25**	**0.00**

Summary	Values
Total buy traded contracts	31,25
Total sell traded contracts	31,25
Min (qtdeVi; qtdeCi)	**31,25**
Average Buy Price	98,112.500.00
Average Sell Price	97,918.750.00
Pmci	3,139.60
Pmvi	3,133.40
pmvi-pmci	6.20

Account balance

Client's balance

Entity	Balance	SFD
178	R$ 1,100.00	0.11%
179	R$ 193,750.00	19.37%
Client 123456	**R$ 194,850.00**	**19.48%**

4.1.6   Forward trade balance by document (STD)

The purpose of the STD is to ensure that the total investor's position netting in forward trades does not exceed the forward position limit by client and by instrument.

- Features

This limit is set by the participant on an optional basis for the client.

This limit is assessed regardless of the nature of the order sent by the investor, be it a trading desk or a DMA trade.

The assessment exists for the equity segment only.

This assessment exists for clients, accounts and traders (per instrument). However, the PNP/PN should be aware of this, since not all account types are authorized to trade forward as per the trading rule in the registration and the clearinghouse. In this case, the PNP/PN is required to assess whether a particular forward order is trading under an authorized account, even if the limit is set and within the client's acceptable amounts.

Accounts that are able to trade forward: permanent account and master account (transitory).

There will be an exchange limit for each forward instrument. If this limit is not managed by the PNP/PN, then the exchange limit will be inherited.

The limit managed by the PNP/PN will not be allowed in a forward instrument higher than the exchange limit.

Sending forward orders to clients or accounts in protected mode will not be allowed.

For calculation purposes:

- Forward trades on each maturity or forward trade type must be included within the related underlying asset (security);

- This measure uses the net balance (in quantity) from the post-trade inventory and the trades executed on the day, plus the individual assessment of each new order to be sent to the trading engine.

    STD calculation metrics:

$$STD(i) = C(i) + S(i) + Q_{reg}$$

Where:

- C is the netting (C - V) of the open forward position on the i instrument;

- S is the netting (C-V) of the forward trades on the day on the i instrument; and

- QReg is the trade quantity being registered with the standard positive signal for buy trades and negative for sell trades.

4.1.7   Risk measure

For both segments (equity and derivatives), there is a conceptual financial assessment, but this value is obtained directly through the quantity stated in the entered order or in executed trades.

- Purpose

To limit the risk generated by trades and orders executed throughout the day. The risk calculation considers the inventory of open positions in the client.

- Features

This limit is set by the PNP/PN and is mandatory for the client; and optional for the account. This limit will not be assessed by professional traders, only for accounts linked to these trades.

For calculation purposes:

- Cash market instruments of the equity or private fixed income segment (equities, odd-lot, BDRs, ETFs, FII, FIA, FIP) must be disregarded as they are covered by the SDP measure. However, their options must be considered;

- Forward equity instruments will be disregarded as they are covered by the STD measure;

- All derivatives segment contracts are considered;

- Options exercises will be included within the underlying asset (security), only if the underlying asset market is considered;

- User defined strategies (UDSs) are assessed atomically - as a single instrument;

- Test instruments for both segments will be disregarded.

This risk dimension uses the following for its calculation:

- The unit risk constants per instrument (market value variation) in each stress scenario. Note that the stress scenarios are the same as those used by BM&FBOVESPA Clearinghouse CORE margin calculation methodology;

- Day trades and open orders (or orders to send) to the trading engine.

This assessment is in place for clients and their associated permanent and transitory accounts.

For a permanent account, the calculation of the risk measure considers the following:

- Day trades and open orders in the order book, assessed in the same stress scenarios;

- The risk of day trades per scenario – resulting from the sum of the risk, be it profit or loss, of trades (net balance in quantity) of each instrument in the scenario; and

- Open orders in the order book per scenario – resulting from the sum of the risk of loss of only the open end of each order in each instrument in the scenario.

For a transitory account, the calculation of the risk measure considers:

- The open orders in the order book per stress scenario - resulting from the sum of the risk of loss of only the open end of each order in each instrument in the scenario;

- The risk of day trades per scenario - resulting from the sum of the risk of loss of only the trades of each order in each instrument in the stress scenario; and

- For the client, the calculation of the risk measure follows the same aggregation defined by its permanent and transitory accounts.

Unlike other risk measures, it has the following specific features:

- The risk assessment must be defined in the client or in the accounts of that client, and cannot be defined in both entities;

- This choice is mutually exclusive and cannot be changed in intraday trades (changes to this feature are effective on D+1 only or with full reload of the LINe Trading platform);

- This feature is due to the high processing cost of this assessment, and, therefore, it prevents the assessment to be done together in two entities (client and account) without compromising the system's performance;

- This limit setup is mandatory for the client, which means that the lack of a set limit (directly or hierarchically) implies the immediate order rejection.

- The setup of this limit is optional for the account, which means that in the absence of this setup, the client setup will be used as benchmark, and if the latter is absent, it implies the immediate order rejection;

- In cases where there is a violation of the risk limit in the carrying, the protected mode will be enabled for the document and only the orders that violated this measure will be canceled, therefore the other orders opened in the book that did not originate from the violation of the risk measure will not be canceled.

Detail calculation for a permanent account:

$$RMKT_{CtD} = -min\left\{\substack{min \\ \forall c}\left(\sum_{\forall i}\begin{bmatrix}(C_i - V_i) \times RU_{(i,c)} \\ + \\ min(OC_i \times RU_{(i,c)}; 0) \\ + \\ min(-OV_i \times RU_{(i,c)}; 0) \\ + \\ min(of_i \times RU_{(i,c)}; 0)\end{bmatrix}\right), 0\right\}$$

Detail calculation for a transitory account:

$$RMKT_{CtT} = -min\left\{\substack{min \\ \forall c}\left(\sum_{\forall i}\begin{bmatrix}min(C_i \times RU_{(i,c)}; 0) \\ + \\ min(-V_i \times RU_{(i,c)}; 0) \\ + \\ min(OC_i \times RU_{(i,c)}; 0) \\ + \\ min(-OV_i \times RU_{(i,c)}; 0) \\ + \\ min(of_i \times RU_{(i,c)}; 0)\end{bmatrix}\right); \quad 0\right\}$$

Detail calculation for the document:

$$RMKT_{Doc} = -min\left\{\substack{min \\ \forall c}\left(\sum_{\forall i}\begin{bmatrix}\sum_{\forall CtD}(C_i - V_i) \times RU_{(i,c)} \\ + \\ \sum_{\forall CtT}\begin{bmatrix}min(C_i \times RU_{(i,c)}; 0) \\ + \\ min(-V_i \times RU_{(i,c)}; 0)\end{bmatrix} \\ + \\ \sum_{\forall CtD, \forall CtT}\begin{bmatrix}min(OC_i \times RU_{(i,c)}; 0) \\ + \\ min(-OV_i \times RU_{(i,c)}; 0)\end{bmatrix} \\ + \\ min(of_i \times RU_{(i,c)}; 0)\end{bmatrix}\right), 0\right\}$$

Where:

$RMKT_{CtD}$: is the market Risk for a permanent account

$RMKT_{CtT:}$ is the market Risk for a transitory account;

$RMKT_{DOC:}$ is the market Risk for a document;

C: is each existing scenario;

$I:$ is each traded instrument;

$CO_{(1,c):}$ is the one-dimensional matrix *[1 x c]* of the opening portfolio risk on the day in each account scenario (remains unaltered throughout the day);

$RU_{(i,c):}$ is the two-dimensional matrix *[i x c]* of the constant unit risk for each instrument (row) in each scenario (column);

$C_{i:}$ is the balance (in quantity) of buy trades executed for the account in the instrument *I*;

$V_{i:}$ is the balance (in quantity) of sell trades executed for the account in the instrument *I*;

$OC_{i:}$ is the balance (in quantity) of buy open orders for the account in the instrument *I*;

$OV_{i:}$ is the balance (in quantity) of sell open orders for the account in the instrument *I*;

$of_{i:}$ is the order (quantity) under analysis for the account in instrument *i*. For buy orders, this value is positive; and, for sell orders, negative.

Example 1: Scenario with one permanent account trading with only one instrument

Assumptions

- The client holds permission and set up limits on Currency and Index Future authorized makets.

  - Document 123456 has only one permanent account (ACC10);

  - Risk Measure limit (RMKT) is set up on R$3,000,000.

Trades Balance (S) = 0

Buy Orders (OC) = 0

Sell Orders (OV) = 0

A) New Order.

At 10:00 am:

The client enters a new bid order for 100 DOLN18 contracts.

Permanent account	Instrument	C	V	S = C -V	OC	OV	of
1000	DOLN18	0	0	0	100	0	

In this example, we will use only 5 scenarios instead of 10,000, for easy visualization.

The 5 scenarios calculated by the Core (Post-Trading) and sent to LiNe Trading for the DOLN18 instrument were:

CORE Scenarios					
Instruments	Scen1	Scen2	Scen3	Scen4	Scen5
DOLN18	700	20	-300	-800	-20,2

The DOLN18 instrument in scenario 1 has a gain of R$ 700,00; scenario 2 has a gain of R$ 20,000.00; and scenario 3 has a loss of R$ 300.00 and so on.

Risk of the DOLN18 order:

$$R(of_1)_c = min(of_1 \times RU_{(1,c)}; 0)$$

R (of) = (order quantity) * (Scenario value)					
Formula	Scen1	Scen2	Scen3	Scen4	Scen5
$R(of_1)_c$	0	0	-30	-80	-2,020,000

Scenarios 1 and 2 would have gains of R$ 70,000 and R$ 2,000,000, so they will be discarded.

Risk of the client's buy orders open in the book (the client does not have open orders).

$$R(OC_1)_c = min(OC_1 \times RU_{(1,c)}; 0)$$

R (OC) = (bid quantity in the book) * (scenario value)					
Formula	Scen1	Scen2	Scen3	Scen4	Scen5
$R(of_1)_c$	0	0	0	0	0

Risk of the client's sell orders open in the book (the client does not have open orders).

$$R(OV_1)_c = min(-OV_1 \times RU_{(1,c)}; 0)$$

R (OV) = (sell quantity in the book) * (scenario value)					
Formula	Scen1	Scen2	Scen3	Scen4	Scen5
$R(OV_1)_c$	0	0	0	0	0

Riskf of executed trades for DOLN18:

$$R(S_1)_c = (C_i - V_i) \times RU_{(i,c)}$$

R (S) = (trades balance) * (scenario value)					
Formula	Scen1	Scen2	Scen3	Scen4	Scen5
$R(S_1)_c$	0	0	0	0	0

In this case, the positive scenarios are taken into account (gains are considered), therefore there is a trade-off between long and short positions.

The table below will be represented by the summary of the results calculated by the system, called $R(S, OF, of)$. The risk of the portfolio is composed of the balance of *S* executed trades, orders in the *OF* book and incoming orders *of*.

Making the R (S, OF, of)					
	Scen1	Scen2	Scen3	Scen4	Scen5
$R(of_1)_c$	0	0	-30,000	-80,000	-2,020,000
$R(OC_1)_c$	0	0	0	0	0
$R(OV_1)_c$	0	0	0	0	0
$R(S_1)_c$	0	0	0	0	0
$R(S, OF, of)_c$	0	0	-30,000	-80,000	-2,020,000

$$R(S_1, OF_1, of_1)_c = R(S_1)_c + R(OC_1)_c + R(OV_1)_c + R(of_1)_c$$

The risk measure given by:

$$RMKT_{CtDef} = \frac{min}{\forall c}\left\{\sum_i [R(S_i)_c + R(OC_i)_c + R(OV_i)_c + R(of_i)_c]\right\}$$

$$RMKT_{CtDef} = \frac{min}{\forall c}\left\{\sum_i [R(S_i, OF_i, of_i)_c]\right\}$$

Since there's only 1 instrument, it is not necessary to sum to i.

$$RMKT_{ctDef} =$$

$$mín[R(S_1, OF_1, of_1)_1, R(S_1, OF_1, of_1)_2, R(S_1, OF_1, of_1)_3, R(S_1, OF_1, of_1)_4, R(S_1, OF_1, of_1)_5]$$

$$RMKT_{ctDef} = mín[\, 0, 0, -30{,}000, -80{,}000, -2{,}020{,}000]$$

$$RMKT_{ctDef} = -2{,}020{,}000$$

By convention the RMKT view in LiNe Trading is positive for losses and zero for gains, thus:

$$RMKT_{ctDef} = \mathbf{2{,}020{,}000}$$

Limit given on $RMKT$ = 3,000,000

Therefore, the order will be accepted.

B) **The order of item A has been accepted and is in the Order Book.**

Trades Balance (S) = 0

Buy Orders (OC) = 100

Sell Orders (OV) = 0

Incoming Order = 0

Risk measure limit = R$ 3,000,000

Making the R (S, OF, of)				
Scen1	Scen2	Scen3	Scen4	Scen5

	Scen1	Scen2	Scen3	Scen4	Scen5
$R(of_1)_c$	0	0	0	0	0
$R(OC_1)_c$	0	0	-30.000	-80.000	-2.020.000
$R(OV_1)_c$	0	0	0	0	0
$R(S_1)_c$	0	0	0	0	0
$R(S, OF, of)_c$	**70,000**	**2,000,000**	**-30,000**	**-80,000**	**-2,020,000**

$$R(S_1, OF_1, of_1)_c = R(S_1)_c + R(OC_1)_c + R(OV_1)_c + R(of_1)_c$$

$$RMKT_{ctDef} =$$

$$mín[R(S_1, OF_1, of_1)_1, R(S_1, OF_1, of_1)_2, R(S_1, OF_1, of_1)_3, R(S_1, OF_1, of_1)_4, R(S_1, OF_1, of_1)_5]$$

$$RMKT_{ctDef} = mín[\, 0, 0, -30,000, -80,000, -2,020,000]$$

$$RMKT_{ctDef} = -2,020,000$$

By convention the RMKT view in LiNe Trading is positive for losses and zero for gains, thus:

$$\boldsymbol{RMKT_{ctDef} = 2,020,000}$$

C) The order has been aggressed and became a trade.

Making the R (S, OF, of)					
	Scen1	Scen2	Scen3	Scen4	Scen5
$R(of_1)_c$	0	0	0	0	0
$R(OC_1)_c$	0	0	0	0	0
$R(OV_1)_c$	0	0	0	0	0
$R(S_1)_c$	70,000	2,000,000	-30,000	-80,000	-2,020,000
$R(S, OF, of)_c$	**70,000**	**2,000,000**	**-30,000**	**-80,000**	**-2,020,000**

It's important to notice that, with the executed trade, scenarios 1 and 2 are taken into account, since they're gain scenarios.

$$R(S_1, OF_1, of_1)_c = R(S_1)_c + R(OC_1)_c + R(OV_1)_c + R(of_1)_c$$

$$RMKT_{ctDef} =$$

$$mín[R(S_1, OF_1, of_1)_1, R(S_1, OF_1, of_1)_2, R(S_1, OF_1, of_1)_3, R(S_1, OF_1, of_1)_4, R(S_1, OF_1, of_1)_5]$$

$$RMKT_{ctDef} = mín[\, 0, 0, -30,000, -80,000, -2,020,000]$$

$$RMKT_{ctDef} = -2,020,000$$

By convention the RMKT view in LiNe Trading is positive for losses and zero for gains, thus:

$$RMKT_{ctDef} = \mathbf{2,020,000}$$

Example 2:

Scenario with one permanent account trading with two instruments.

Instrument	Value
DOLN18	
Trade Balance	0
Buy Orders (OC)	100
Sell Orders (OV)	0
Incoming Orders (of)	0
Risk Limit	3,000,000

Instrument	Value
DI1F20	
Trade Balance	0
Buy Orders (OC)	0
Sell Orders (OV)	0
Incoming Orders (of)	-200
Risk Limit	3,000,000

Considering that the DOLN18 order has been accepted (as seen on Example 1), now the new sell order for 200 contracts of DI1F20 will be analyzed.

Permanent Account	Instruments	C	V	S	OC	OV	of
1000	DOLN18	0	0	0	100	0	0
1001	DI1F20	0	0	0	0	0	-200

Scenarios calculated by the CORE.

CORE Scenarios					
Instruments	Scen1	Scen2	Scen3	Scen4	Scen5
DOLN18	700	20.000	-300	-800	-20.200
DI1F20	500	12.000	200	-800	-20.200

Risk of the new order for DI1F20.

$$R(of_2)_c = min\big(of_2 \times RU_{(2,c)}; 0\big)$$

R (of) = (order quantity) * (scenario value)					
Formula	Scen1	Scen2	Scen3	Scen4	Scen5
	-100,000	2,400,000	-40,000	0	0

Risk of the bid orders for DOLN18 and DI1F20 in the order book.

$$R(OC_1)_c = min(OC_1 \times RU_{(1,c)}; 0)$$

$$R(OC_2)_c = min(OC_2 \times RU_{(2,c)}; 0)$$

$$R(OC)_c = \sum_i min(OC_i \times RU_{(i,c)}; 0)$$

R (OC) = (Bid orders quantity in the book) * (scenario value)					
Formula	Scen1	Scen2	Scen3	Scen4	Scen4
$R(OC_1)_c$	0	0	-30,000	-80,000	-2,020,000
$R(OC_2)_c$	0	0	0	0	0
$R(OC)_c$	0	0	-30,000	-80,000	-2,020,000

Risk of the sell orders in the order book.

$$R(OV_1)_c = min(OV_1 \times RU_{(1,c)}; 0)$$

$$R(OV_2)_c = min(OV_2 \times RU_{(2,c)}; 0)$$

$$R(OV)_c = \sum_i min(OV_i \times RU_{(i,c)}; 0)$$

R (OV) = (Sell orders quantity in the book) * (scenario value)					
Formula	Scen1	Scen2	Scen3	Scen4	Scen5
$R(OV_1)_c$	0	0	0	0	0
$R(OV_2)_c$	0	0	0	0	0
$R(OV)_c$	0	0	0	0	0

Risk of the executed trades.

$$R(S_1)_c = (C_1 - V_1) \times RU_{(1,c)}$$

$$R(S_2)_c = (C_2 - V_2) \times RU_{(2,c)}$$

R (OV) = (Sell orders quantity in the book) * (scenario value)					
Formula	Scen1	Scen2	Scen3	Scen4	Scen5
$R(S_1)_c$	0	0	0	0	0
$R(S_2)_c$	0	0	0	0	0
$R(S)_c$	0	0	0	0	0

Note: if there were trades, there would be trade-offs between bid and sell positions.

Summary.

Making the R (S, OF, of)					
	Scen1	Scen2	Scen3	Scen4	Scen5
$R(of)_c$	-100,000	-2,400,000	-40,000	-0	0
$R(OC)_c$	0	0	-30,000	-80,000	-2,020,000
$R(OV))_c$	0	0	0	0	0
$R(S)_c$	0	0	0	0	0
$R(S, OF, of)_c$	**-100,000**	**-2,400,000**	**-70,000**	**-80,000**	**-2,020,000**

$$R(S, OF, S)_c = R(S)_c + R(OC)_c + R(OV)_c + R(of)_c$$

$$RMKT_{ctDef} =$$

$$mín[R(S, OF, of)_{(1)}, R(S, OF, of)_{(2)}, R(S, OF, of)_{(3)}, R(S, OF, of)_{(4)}, R(S, OF, of)_{(5)}]$$

$$RMKT_{ctDef} = mín[-100,000, -2,400,000, -70,000, -80,000, -2,020,000]$$

$$RMKT_{ctDef} = -2,400,000$$

By convention the $RMKT$ view in LiNe Trading is positive for losses and zero for gains, thus:

$$\boldsymbol{RMKT_{ctDef} = 2,400,000}$$

Limit given on $RMKT$ = 3,000,000

Therefore, the order will be accepted.

B) The order of item A has been accepted and is in the Order Book.

Making the R (S, OF, of)					
	Scen1	Scen2	Scen3	Scen4	Scen5
$R(of)_c$	0	0	0	0	0
$R(OC)_c$	0	0	-30,000	-80,000	-2,020,000
$R(OV))_c$	-100,000	-2,400,000	-40,000	0	0
$R(S)_c$	0	0	0	0	0
$R(S,OF,of)_c$	**-100,000**	**-2,400,000**	**-70,000**	**-80,000**	**-2,020,000**

$$R(S,OF,S)_c = R(S)_c + R(OC)_c + R(OV)_c + R(of)_c$$

$$RMKT_{ctDef} =$$
$$mín[R(S,OF,of)_{(1)}, R(S,OF,of)_{(2)}, R(S,OF,of)_{(3)}, R(S,OF,of)_{(4)}, R(S,OF,of)_{(5)}]$$

$$RMKT_{ctDef} = mín[-100,000, -2,400,000, -70,000, -80,000, -2,020,000]$$

$$RMKT_{ctDef} = -2,400,000$$

By convention the $RMKT$ view in LiNe Trading is positive for losses and zero for gains, thus:

$$RMKT_{ctDef} = 2,400,000$$

C) The orders became trades.

There are no open orders in the book, therefore all risk limits are zero. The next step is to calculate the risk balance S (executed trades).

R(S) = (trade balance) * (scenario value)					
Instruments	Scen1	Scen2	Scen3	Scen4	Scen5
DOLN18	70	2,000,000	-30	-80	-2,020,000
DI1F20	-100	-2,400,000	-40	-800	-20,2

It's important to notice that with regards of executed trades, the gain scenarios are taken into account. In this case, there will be trade-off between gain scenarios.

Making the R (S, OF, of)

	Scen1	Scen2	Scen3	Scen4	Scen5
$R(of)_c$	0	0	0	0	0
$R(OC)_c$	0	0	0	0	0
$R(OV))_c$	0	0	0	0	0
$R(S)_c$	-30,000	-400,000	-70,000	80,000	2,020,000
$R(S, OF, of)_c$	**-30,000**	**-400,000**	**-70,000**	**80,000**	**-2,020,000**

$$R(S, OF, S)_c = R(S)_c + R(OC)_c + R(OV)_c + R(of)_c$$

$$RMKT_{ctDef} =$$

$$mín[R(S, OF, of)_{(1)}, R(S, OF, of)_{(2)}, R(S, OF, of)_{(3)}, R(S, OF, of)_{(4)}, R(S, OF, of)_{(5)}]$$

$$RMKT_{ctDef} = mín(-30,000, -400,000, -70,000, 80,000, 2,020,000)$$

$$RMKT_{ctDef} = -400,000$$

By convention the $RMKT$ view in LiNe Trading is positive for losses and zero for gains, thus:

$$RMKT_{ctDef} = 400,000$$

4.1.8   Protected mode

Protected mode refers to the status of the trading tool whereby only reverse operations of the inventory of trades executed throughout the day and bearing the identification of the end client are allowed.

- Features

The protected mode is activated in the following situations:

Automatically when there is a violation of the SFD measure.

In case of violation of the SFD measures on the professional trader level, this entity's open orders will not be canceled, but all new orders will be rejected.

Automatically when there is a violation of any measure in the carrying.

Manually, via portal. In this case, it is possible to place any of the portal's relationship entities in the protected mode, i.e., PNP/PN/PL/client/account.

The PNP may place the PN in protected mode and, therefore, all the clients linked to the PN inherit this status and, from this moment, the orders entered in the order book are cancelled and only orders that reduce the clients' position will be accepted. As well as the PN, the PNP may place any client/account linked to it in protected mode.

The PN may place any client/account linked to it in protected mode.

When the client enters into protected mode, the accounts will not be affected. Therefore, trades may be carried out by all the accounts linked to the client provided, if they are orders to reverse the client's position.

As well as the client, LiNe Trading also allows an account to enter into protected mode. When this occurs, the protected mode will be activated exclusively for that account, and will not affect the client.

When the SFD and SDP limit or a risk limit below the limit consumed by a client is managed.

When an entity (PNP/PN) is placed in protected mode, either automatically or manually, all its clients will also enter into protected mode. In events where one client is placed in protected mode, only he/she will enter into protected mode, and their linked accounts do not enter into protected mode.

When in protected mode, the entities present the following features:

- Transitory accounts are not allowed to trade;

- Traders may trade as long as they do not violate the SFD measure and they must have a permanent account assigned upon entering the order;

- Inventory reduction of shares and contracts will only be assessed for end clients and/or accounts (according to the SPI variable presented in section 4.1.9 - SPI).

In protected mode, trading takes on a different behavior in comparison to risk measure assessments. Some risk measures are evaluated, while others are only updated. Furthermore, two new risk measures are activated for assessment (SPI and RMKT with incremental limit for open exposure).

- SPCI and SPVI - Validates

- TMOC and TMOV evaluates the entry of new orders.

- Risk will evaluate the entry of new orders.

- SDP – updates

- SFD – updates

When an entity enters into protected mode, LiNe Trading automatically triggers the following actions:

- Blocks the entry of new orders relating to that entity;

- If the protected mode is triggered due to a violation of SFD measure, be it in the executor, intermediary or carrying, LiNe Tradin will send a cancellation command of all the orders available in the order book, while abiding by the trading rules (auction, trading permission, etc.). If any other measure (SDO, Risk, SPCI/SPVI and STD) is violated with the exception of the SFD of a document in the carrying, the protected mode will be triggered, but only orders derived from that violation will be canceled. Therefore the remaining orders, that not immediately participated in this violation, will be canceled;

- Authorizes the entry of new orders, provided they meet previous set limits and the measures placed in protected mode (inventory reduction measured by the SPI variable, and risk reduction).

- Orders on the forward market are prohibited.

The protected mode option is deactivated exclusively through participant intervention.To better illustrate the behavior of risk measures violations, please refer to the figure below for a better understanding.

Behavior in metrics violation			
Entity	**Metric**	**Protected Mode**	**Action**
Executor	SDP		Orders rejection
	SFD	X	Cancellation of all orders
	Risk		Orders rejection
	SPCI		Orders rejection
	SPVI		Orders rejection
	STD		Orders rejection
Carrying	SDP	X	Cancellation of orders that violated the metric
	SFD	X	Cancellation of all orders
	Risk	X	Cancellation of orders that violated the metric
	SPCI	X	Cancellation of orders that violated the metric
	SPVI	X	Cancellation of orders that violated the metric
	STD	X	Cancellation of orders that violated the metric
CAP Aggregated Position	SDP		Orders rejection
	SFD	X	Cancellation of all orders
	Risk		Orders rejection
Professional trader	SDP		Orders rejection
	SFD		Orders rejection
	SPCI		Orders rejection
	SPVI		Orders rejection
	STD		Orders rejection

4.1.9   Potential balance on the instrument (SPI)

The SPI aims to ensure that the inventory of trades on an instrument is reduced. The assessment exists for both segments and is done by instrument. For calculation purposes, the SPI measure follows the same rules as SPCI/SPVI.

This assessment exists only for clients and permanent accounts (by instrument). When the client is in protected mode, only the client's SPI will be evaluated. Therefore, the accounts linked to that client will trade normally. However, when the account is in protected mode, only this account will carry the SPI assessment.

If the protected mode is activated in the carrying, the give-up operations are evaluated in line (critical path of the order), guaranteeing the reduction of position (SPI) in the carrying. If it is activated in the PNP or PN, the reduction of SPI should be in the PNP or PN.

This limit has no setup, since its assessment is dynamic and, as mentioned before, it only allows reduction in the inventory of trades (reduction of this limit). Therefore:

- For instruments with a long balance prior to entering into protected mode, only ask orders are authorized; and

- For instruments with a short balance prior to entering into protected mode, only bid orders are authorized.

Protected mode metrics

Permanent account

$$SPI_{CtDf}(i) = S(i) + OF(i) + of_N(i)$$

Where:

$SPI_{CtDf}(i)$ O is the potential balance of the permanent account in the i instrument;

$S(i)$ is the trade balance in protected mode in the i instrument (positive for buy trades / negative for sell trades);

$OF(i)$ is the sum of open orders in protected mode in the i instrument (positive for bid orders / negative for ask orders);

$of_N(i)$ is the new order (positive for bid orders / negative for ask orders).

Note: For instruments with a long balance prior to entering into protected mode, only ask orders are authorized. For instruments with a short balance prior to entering into protected mode, only bid orders are authorized.

Transitory account

Due to the characteristics of this account, whereby buy and sell trades are not offset, the limits resulting from the trade will be increased and it should be rejected.

Client

$$SPI_{DOC}(i) = \sum_{\forall Ct} SPI_{CtDf}(i)$$

Sendo:

$SPI_{DOC}(i)$ is the client's potential balance in the instrument.

4.1.10 Medida Risco em Modo Protegido – IRMKT

For both segments (equity and derivatives), there is a conceptual financial assessment, but this value is obtained directly through the quantity stated in the entered order or in executed trades.

- Purpose

The protected-mode risk measure aims to ensure that transactions carried out after the protected-mode triggering reduce the risk exposure of the document or account. Such valuation is made at the time of order entry.

Sending new orders to reduce the SPI's position may increase risk exposure (IRMKT), which may occur because the client may have bid positions and ask positions in different instruments. To ensure orderly positioning of the document or account, there will be a risk increase limit (generated by a reduction) of the position, in protected mode.

- Features

Protected-mode risk increment threshold is an unique value and determined by B3 for all documents or accounts. The PNP/PN may reduce this limit for their documents or accounts.

This measure is only evaluated when the entity is in protected mode.

This limit's assessment on the destination participant of an account with a give-up link is performed in-line in protected mode, although it is performed in near time outside protected mode.

The violation of this measure implies the immediate rejection of the order.

There will be an Exchange limit for the risk measure in protected mode, in the absence of administration of this limit by the PNP and PN, the Exchange limit will be inherited.

It will not be allowed to the PNP and PN to set up limits for protected-risk measure greater than the Exchange limit.

Option exercises shall not be prevented from being exercised even if they violate the risk position in protected mode.

For calculation purposes:

Definition 1: $R(S, OF, of)_{MP}$ is the portfolio risk after the entity enters into Protected Mode, considering the balance of executed trades (S), open orders in the book (OF) and the incoming order (of).

Definição 2: $R(S)_{MP}$ is the portfolio risk after the entity enters into Protected Mode, considering only executed trades (S).

Note: at the moment a trade is executed, the risk will be updated only if there is risk reduce.

Where:

$R^{velho}(S)_{MP}$ is the risk of executed trades before the order becomes a trade;

$R^{novo}(S)_{MP}$ is the risk of executed trades after the order becomes a trade;

If $R^{novo}(S)_{MP}$ represents a risk smaller* than $R^{velho}(S)_{MP}$, so:

$$R(S)_{MP} = R^{novo}(S)_{MP}$$

Important reminder that for risk measure, the calculations are negative.

Definition 3:

$$\Delta RMKT = R(S, OF, of)_{MP} - R(S)_{MP}$$

Example 1:

Assumptions**:**

➢ The document is in protected mode;

➢ All open order in the book were canceled.

DOLN18	Limits
Trade Balance (S)	400
Buy Orders (OC)	0
Sell Orders	0
Incoming Order (of)	0
RMKT Limit	10,000,000
ΔRMKT Limit	2,000,000

DI1F20	Limits
Trade Balance (S)	500
Buy Orders (OC)	0
Sell Orders (OV)	0
Incoming Order (of)	0
RMKT Limit	10,000,000
ΔRMKT Limit	2,000,000

Permanent account	Instrument	C	V	S	OC	OV	of
DOLN18	Intrument_1	400	0	400	0	0	0
DI1F20	Intrument_2	0	500	-500	0	0	0

The 10,000 CORE scenarios will be represented by the 5 scenarios below:

CORE Scenarios					
Risks	Scen1	Scen2	Scen3	Scen4	Scen5
DOLN18	700	20.000	-300	-800	-20.000
DI1F20	710	20,100	-350	-790	-20.000

There is no position in OF or in of, so please refer to the risk $R(S)_{MP}$ table below:

$[B]^3$

R(S) = (trade balance) * (scenario value)					
	Scen1	Scen2	Scen3	Scen4	Scen5
$R(S_1)_1$	280.000	8,000,000	-120.000	-320.000	-8,000,000
$R(S_2)_1$	-355.000	-10,050,000	175.000	395.000	10,000,000
$R(S)_C$	-75.000	**-2,050,000**	**55.000**	**75.000**	**2,020,000**

$R(S)_{MP} = mín[\ -75{,}000, -2{,}050{,}000, -55{,}000, 75{,}000, 2{,}000{,}000]$

$R(S)_{MP} = -2{,}050{,}000$

Making the R (S, OF, of)					
	Scen1	Scen2	Scen3	Scen4	Scen5
$R(of)_c$	0	0	0	0	0
$R(OC)_c$	0	0	0	0	0
$R(OV))_c$	0	0	0	0	0
$R(S)_c$	-75,000	-2,050,000	55,000	75,000	2,000,000
$R(S, OF, of)_c$	**-75,000**	**-2,050,000**	**55,000**	**75,000**	**2,000,000**

$R(S, OF, of)_{MP} = mín[-75{,}000, -2{,}050{,}000, 55{,}000, 75{,}000, 2{,}000{,}000]$

$R(S, OF, of)_{MP} = -2{,}050{,}000$

$\Delta RMKT = R(S, OF, of)_{MP} - R(S)_{MP}$

$\Delta RMKT = -2{,}050{,}000 - (-2{,}050{,}000\ )$

$\Delta RMKT = -2{,}050{,}000 + 2{,}050{,}000$

$\Delta RMKT = 0$

The client enters an order for 100 DOLN18 contracts.

Permanent account Conta definitiva	Instruments	C	V	S	OC	OV	of
1000	DOLN18	400	0	400	0	0	-100
1000	DI1F20	0	500	-500	0	0	0

Making the R (S, OF, of)					
	Scen1	Scen2	Scen3	Scen4	Scen5
$R(of)_c$	-70,000	-2,000,000	0	0	0
$R(OC)_c$	0	0	0	0	0
$R(OV))_c$	0	0	0	0	0
$R(S)_c$	-75,000	-2,050,000	55,000	75,000	2,000,000
$\boldsymbol{R(S,OF,of)_c}$	**-145,000**	**-4,050,000**	**55,000**	**75,000**	**2,000,000**

$$R(S)_{MP} = mín[\,-75,000, -2,050,000, -55,000, 75,000, 2,000,000\,]$$

$$R(S)_{MP} = -2,050,000$$

$$R(S,OF,of)_{MP} = mín[-145,000, -4,050,000, 55,000, 75,000, 1,920,000]$$

$$R(S,OF,of)_{MP} = -4,050,000$$

$$\Delta RMKT = R(S,OF,of)_{MP} - R(S)_{MP}$$

$$\Delta RMKT = -4,050,000 - (-2,050,000\,)$$

$$\Delta RMKT = -4,050,000 + 2,050,000$$

$$\Delta RMKT = 2,000,000$$

Limit given to $\Delta RMKT$= 2,000,000

Therefore, the order will be accepted.

The sell order for DOLN18 has been accepted.

Making the R (S, OF, of)					
	Scen1	Scen2	Scen3	Scen4	Scen5
$R(of)_c$	0	0	0	0	0
$R(OC)_c$	0	0	0	0	0
$R(OV))_c$	-70,000	-2,000,000	0	0	0
$R(S)_c$	-75,000	-2,050,000	55,000	75,000	2,000,000

$$R(S, OF, of)_c \quad \text{-145,000} \quad \text{-4,050,000} \quad \text{55,000} \quad \text{75,000} \quad \text{2,000,000}$$

$$(S)_{MP} = -2,050,000$$

$$R(S, OF, of)_{MP} = -4,050,000$$

$$\Delta RMKT = 2,000,000$$

Note: When the orders in the book become trade, the risk $R(S)_{MP}$ will be updated only if there is reduction.

If there's reduction, then:

The 100 contracts order for DOLN18 became a trade.

Here is the calculation:

Permanent account Conta definitiva	Instrument	C	V	S = C-V	OC	OV	of
1000	DOLN18	400	100	300	0	0	0
1000	DI1F20	0	500	-500	0	0	0

R(S) = (trade balance) * (scenario value)					
	Scen1	Scen2	Scen3	Scen4	Scen5
$R(S_1)_1$	210.000	6,000,000	-90.000	-240.000	-6,000,000
$R(S_2)_1$	-355.000	-10,050,000	175.000	395.000	10,000,000
$R(S)_c$	-145.000	**-4,050,000**	85.000	155.000	4,000,000

$$R^{novo}(S)_{MP} = min[-145,000, -4,050,000, 85,000, 155,000, 4,000,000]$$

$$R^{novo}(S)_{MP} = -4,050,000$$

$R^{velho}(S)_{MP}$ = is the risk of trades executed before the order becomes a trade (calculated on item c of this example);

$R^{velho}(S)_{MP} = -2,050,000$

It was mentioned previously that if $R^{novo}(S)_{MP}$ represents a risk smaller* than que $R^{velho}(S)_{MP}$, so $R(S)_{MP} = R^{novo}(S)_{MP}$.

In this case, $R^{novo}(S)_{MP}$ represents a risk larger than $R^{velho}(S)_{MP}$.

Therefore, the risk $R(S)_{MP}$ will not be updated and will remain:

$R(S)_{MP} = -2,050,000$.

Making the R (S, OF, of)					
	Scen1	Scen2	Scen3	Scen4	Scen5
$R(of)_c$	0	0	0	0	0
$R(OC)_c$	0	0	0	0	0
$R(OV))_c$	0	0	0	0	0
$R(S)_c$	-145,000	-4,050,000	85,000	155,000	4,000,000
$R(S,OF,of)_c$	**-145,000**	**-4,050,000**	**55,000**	**75,000**	**2,000,000**

$R(S,OF,of)_{MP} = mín[-145,000, -4,050,000, 85,000, 155,000, 4,000,000]$

$R(S,OF,of)_{MP} = -4,050,000$

$\Delta RMKT = R(S,OF,of)_{MP} - R(S)_{MP}$

$\Delta RMKT = -4,050,000 - (-2,050,000)$

$\Delta RMKT = -4,050,000 + 2,050,000$

$\Delta RMKT = -2,000,000$

Please note that the limit given to $\Delta RMKT$ (2,000,000) has been reached. So, any new sell order for DOLN18 will be rejected.

For the client to continue to reduce the position, an order for DI1F20 must be sent.

The client enters another DOLN18 order, and not for DI1F20.

$$R^{velho}(S)_{MP} = -2,050,000$$

Permanent account	Instrument	C	V	S = C-V	OC	OV	of
1000_1	Intrument_1	400	100	300	0	0	-100
1000_1	Intrument_2	0	500	-500	0	0	0

Making the R (S, OF, of)					
	Scen1	Scen2	Scen3	Scen4	Scen5
$R(of)_c$	-70,000	-2,000,000	0	0	0
$R(OC)_c$	0	0	0	0	0
$R(OV))_c$	0	0	0	0	0
$R(S)_c$	-145,000	-4,050,000	85.000	155,000	4,000,000
$R(S, OF, of)_c$	**-215,000**	**-6,050,000**	**85,000**	**155,000**	**4,000,000**

$$R(S, OF, of)_{MP} = mín[-215,000, -6,050,000, 85,000, 155,000, 4,000,000]$$

$$R(S, OF, of)_{MP} = -6,050,000$$

Como vimos no ultimo trade o risco $R(S)_{MP}$ é:

$$R(S)_{MP} = -2,050,000.$$

$$\Delta RMKT = R(S, OF, of)_{MP} - R(S)_{MP}$$

$$\Delta RMKT = -6,050,000 - (-2,050,000)$$

$$\Delta RMKT = -6,050,000 + 2,050,000$$

$$\Delta RMKT = -4,000,000$$

The order has violated the given limito f 2,000,000. Therefore, it's rejected

The client enters an ask order for DI1F20.

Permanent account	Instrument	C	V	S = C-V	OC	OV	of
1000_1	Intrument_1	400	100	300	0	0	0
1000_1	Intrument_2	0	500	-500	0	0	300

Making the R (S, OF, of)					
	Scen1	Scen2	Scen3	Scen4	Scen5
$R(of)_c$	0	0	0	0	0
$R(OC)_c$	0	0	0	0	0
$R(OV))_c$	0	0	0	0	0
$R(S)_c$	-145,000	-4,050,000	0	155,000	4,000,000
$R(S, OF, of)_c$	**-145,000**	**-6,050,000**	**85,000**	**155,000**	**4,000,000**

$$R^{novo}(S)_{MP} = mín[-145,000, -4,050,000, 85,000, 155,000, 4,000,000]$$

$$R^{novo}(S)_{MP} = -4,050,000$$

$$R^{velho}(S)_{MP} = -2,050,000$$

Since $R^{novo}(S)_{MP}$ represents a larger risk than $R^{velho}(S)_{MP}$, the risk $R(S)_{MP}$ will not be updated and will remain:

$$R(S)_{MP} = -2,050,000.$$

$$R(S, OF, of)_{MP} = mín[-145,000, -4,050,000, -20,000, -82,000, -2,000,000]$$

$$R(S, OF, of)_{MP} = -4,050,000$$

$$\Delta RMKT = R(S, OF, of)_{MP} - R(S)_{MP}$$

$$\Delta RMKT = -4,050,000 - (-2,050,000)$$

$$\Delta RMKT = -4,050,000 + 2,050,000$$

$$\Delta RMKT = -2,000,000$$

Result on LiNe Trading: $\Delta RMKT = 2{,}000{,}000$.

Once it's under the given limit on $\Delta RMKT$, the order is accepted.

Please note that again the limit given on $\Delta RMKT$ is reached. However, it's due to the trading of DI1F20 and any new order for this contract will be rejected.

The client should enter a new order for DOLN18 to continue to reduce the position.

The DI1F21 order has been executed.

Permanent account	Instrument	C	V	S = C-V	OC	OV	of
1000_1	Intrument_1	400	100	300	0	0	0
1000_1	Intrument_2	300	500	-200	0	0	0

Making the R (S, OF, of)					
	Scen1	Scen2	Scen3	Scen4	Scen5
$R(of)_c$	0	0	0	0	0
$R(OC)_c$	0	0	0	0	0
$R(OV))_c$	0	0	0	0	0
$R(S)_c$	68,000	1,980,000	-20,000	-82,000	-2,000,000
$R(S, OF, of)_c$	68,000	1,980,000	-20,000	-82,000	2,000,000

$R^{novo}(S)_{MP} = mín[\,-68{,}000, 1{,}980{,}000, -20{,}000, -82{,}000, -2{,}000{,}000]$

$R^{novo}(S)_{MP} = -2{,}000{,}000$

$R^{velho}(S)_{MP} = -2{,}050{,}000$

Since $R^{novo}(S)_{MP}$ represents a risk smaller than $R^{velho}(S)_{MP}$, the risk $R(S)_{MP}$ will be update and will be:

$R(S)_{MP} = -2{,}000{,}000$.

$R(S, OF, of)_{MP} = mín[-68{,}000, 1{,}980{,}000, -20{,}000, -82{,}000, -2{,}000{,}000]$

$$R(S, OF, of)_{MP} = -2,000,000$$

$$\Delta RMKT = R(S, OF, of)_{MP} - R(S)_{MP}$$

$$\Delta RMKT = -2,000,000 - (-2,000,000)$$

$$\Delta RMKT = -2,000,000 + 2,000,000$$

$$\Delta RMKT = 0$$

The client enters an order for 100 DOLN18 contracts.

Permanent account	Instrument	C	V	S = C-V	OC	OV	of
1000_1	Intrument_1	400	100	300	0	0	-200
1000_1	Intrument_2	300	500	-200	0	0	0

$$\Delta RMKT = -2,000,000$$

The order is accepted.

The cliente enters an order for 200 DI1F20 contracts.

Permanent account	Instrument	C	V	S = C-V	OC	OV	of
1000_1	Intrument_1	400	300	100	0	0	0
1000_1	Intrument_2	300	500	-200	0	0	200

$\Delta RMKT = -20.000$ The order is accepted.

4.2 Limit setup

A participant can play more than one role across the trading chain. For example, an institution may define limits as a PNP to its clients, define limits as a give-up executor, or even as a carrying participant. LiNe Trading will reflect this diversification of roles that institutions can assume. In such cases, participants will have access to the respective screens for each role and will be able to define the

profiles, in independent manner, grouped by Clearing Member, as LiNe Trading includes the institutions' settlement chain.

It should be noted that clients without any defined limit or profile settings will automatically be associated with the Default Profile. Further information on the Default Profile can be found in section 3.4.1 – Default Profile.

4.2.1　Limit-receiving entities

LiNe Trading will begin to treat clients, accounts, and professional traders as entities that are liable to receive independent limits to trade.

It is strongly recommended that the limits be managed by the entities through the use of profiles (as described in section 3.4 - Profiles) to reduce the number of entries to be updated in case the system administrators need to act.

There is also the possibility of defining limits per instrument for the SPCI/SPVI, TMOC/TMOV and STD measures for entities or profiles, in order to allow participants to apply a specific restriction. It should be noted that, even with the specific instrument setup, the other limits will still be validated by LiNe Trading before the order is accepted.

The possibilities provided by the system for the definition of limits and maximum limits or CAPS are the following:

4.2.2　PNP X Client

The PNP has necessarily to set the clients' trade limits under its management by authorizing or restricting access to trading as well as the value of the limits within the system as per its assessment of the client.

4.2.3　Give-up link

For the execution of clients' trades through give-up agreements, the limits will be granted in two independent phases, namely:

- Give-up carrying participant: In the first phase, the carrying participant must set up a limit for the client and this limit will aggregate the client's trades by Clearing Member into all executing participants who hold a give-up link to that carrying participant; and

- Give-up executor as a give-up executing participant: In the second phase, the give-up executor must set up a limit for the client as it would for a client not trading via give-up. It should be noted that this limit should be less than or equal to the limit defined by the carrying participant in the first phase.

4.2.4   On Behalf

For the execution of On Behalf trades, the limits should be granted in two phases:

- In the first phase, the PCO executing participant (PNP) must set up a maximum position limit for each intermediary participant and another individual maximum limit (CAP) per client of these participants; and

- In the second phase, the intermediary participant (PNP, PN or PL) will define the limits to its clients, in accordance to the CAPs. The CAP given by the PNP will include a permit that will authorize or not the PN to send orders by traders without the account breakdown. If authorized, the limit of the capture account held by the PNP (executing broker) will be consumed.

It should be emphasized that, even with CAPs being defined, the executing participant of the On-Behalf trade will not have access to the details of the intermediary participant's client, thus maintaining the client's secrecy.

Upon setup, LiNe Trading will control the setting of limits at the institution that received the CAP so that they will not exceed the CAP limit defined by the executing participant.

It is also possible to have both give-up and On Behalf links in the same accounts, and LiNe Trading system will able to handle these features in different screens.

4.2.5   Professional traders

Professional traders are included in LiNe Trading and must receive the limit from their institutions to be able to enter the orders. Otherwise, the orders will be rejected.

Professional traders' limits are set up independently of the clients' limits and serve as trading limits managed by the participant.

The On Behalf execution is also included in the definition of limits for professional traders as a CAP limit set by the executing participant.

There are two types of traders' users in LiNe Trading, namely:

- Trader user: who can access LiNe Trading and verify the consumption of its own limits and the limits of clients below the PNP/PN; and

- Supervising trader user: who can set limits for other traders and verify the consumption of clients below the PNP/PN.

4.3   Tables of limits vs. entities vs. requirements

The following tables show the relationship between the limits, entities and the level of requirement for each item and provide an overview to better understand the relationship between them and guide the management of participants' limits.

B3.COM.BR

Table 1 – Entities and Limits (Inline)

	Executing PNP (Inline)		
	Account	**Document**	**Trader**
SPCI/SPVI	Optional	Optional / Exchange Inherited	Optional / Exchange Inherited
Risk	Conditional	Conditional	N/A
SDP	Optional	Mandatory	Optional
SFD	Optional	Mandatory	Optional
TMOC/TMOV	Optional	Mandatory	Mandatory
SPI (Protected Mode)	N/A	N/A	N/A
Authorized Markets	Optional	Mandatory	Mandatory
STD (Forward)	N/A	Optional / Exchange Inherited	N/A
	CAP Limit for On Behalf link | Sum/Individual Max (Setup)		
SPCI/SPVI	N/A	N/A	N/A
Risk	N/A	Mandatory	N/A
SDP	N/A	Mandatory	Mandatory
SFD	N/A	Mandatory	N/A
TMOC/TMOV	N/A	Optional	Optional
SPI (Protected Mode)	N/A	Mandatory	Mandatory
Authorized Markets	N/A	N/A	N/A
STD (Forward)	N/A	Optional / Exchange Inherited	N/A
	On Behalf link (Inline)		
SPCI/SPVI	Optional	Optional / Exchange Inherited	Optional / Exchange Inherited
Risk	Conditional <= CAP	Conditional <= CAP	Mandatory <= CAP
SDP	Optional	Mandatory <= CAP	Mandatory <= CAP
SFD	Optional	Mandatory <= CAP	Optional
TMOC/TMOV	Optional	Mandatory <= CAP	Mandatory <= CAP
SPI (Protected Mode)	N/A	N/A	N/A
Authorized Markets	Optional	Mandatory	Mandatory
STD (Forward)	N/A	Optional / Exchange Inherited	N/A

Table 2 – Entities and Limits (Near Time)

	PNP/PL Carrying (Near Time)
	Document
SPCI/SPVI	Optional / Exchange Inherited
Risk	Conditional
SDP	Mandatory
SFD	Mandatory
TMOC/TMOV	Mandatory
SPI (Protected Mode)	N/A
Authorized Markets	Mandatory
STD (Forward)	Optional / Exchange Inherited

4.4 Limits assessment

4.4.1 Assessment sequence

As a way of optimizing the system's processing and limit assessment, the sequence in which LiNe Trading will perform the checks before sending the order in normal trading mode to clients and professional traders is:

• Authorized Markets;

• TMOC / TMOV;

• SPCI / SPVI;

• SDP;

• Risk Measure;

• SFD (when there is a buy and sell trade in the same instrument).

In protected mode, the sequence will be:

• TMOC / TMOV;

• SPCI / SPVI / SPI;

• SDP;

• Risk Measure / Incremental Risk;

• SPI.

In protected mode, forwar market orders will not be allowed.

4.4.2 Give-up link

The aggregated limits in the carrying participant of the trade, which combine all trades carried out by executing participants, will be consolidated in near time. This means that the consolidation is off the critical order path. The exception applies

when the client or the carrying participant is in protected mode, moment in which the orders perform inline aggregate validations.

The limits set by the executing participant will be checked inline before the order is sent to the trading engine.

4.4.3   Professional Trader

It should be emphasized that the limits set for the professional trader and the client before the order is entered will be validated, while both conditions should be met for the order to be sent to the trading engine.

The On Behalf execution is also included in the definition of limits for professional traders as a CAP limit set by the executing participant.

Account breakdown is optional for traders. However, if an order originates from a trader without an account breakdown, the capture account and the trader limits will be consumed. If there is a change request where the PNP decides to enter an account, the capture account limits will be removed and transferred to another account. The PNP should be aware of account entry and exit procedures as LiNe Trading will read the accounts entered and removed through the FIX AccountType tag (tag 581). Further details can be found in the FIX specification document: FIX Documentation. For DMA orders, all of them, without exception, will need to report an account.

In the CAP limit given by the PNP there will be a permit authorizing or not traders to send orders without the account breakdown by the PN. If this authorization is granted by the PNP, the PN traders may trade without the account breakdown and all LiNe Trading risk measures will be consumed by the PN's trader and by the PNP's capture account. If the authorization is not granted by the PNP, all orders originating from the PN and without account breakdown will be rejected due to the lack of authorization to use the PNP's capture account (CAP limit).

4.4.4   Orders without a price

For orders sent without a set price (MOA – Market on Auction, MOC – Market on Close and market price), LiNe Trading will use a reference price to calculate the encumbrance on the measures. This price will be:

- Closing or reference price for stocks and options;

- Settlement price for futures contracts;

- Price arbitrated by B3 for the options created online on the trading platform.

4.4.5   Odd-lot instruments

Odd-lot instruments are considered by the system as standard instruments and their positions added to their limits.

4.4.6   Forward trades

Forward instruments are separate instruments and have their own limits, as described in item 4.1.7 - Risk measure. Both the lender and the bidder will have their limits validated.

4.4.7   *User Defined Strategy* (UDS)

4.4.7.1 UDS – RKMT Risk measure

UDSs will be treated by LiNe Trading as a specific instrument and their measures as well as a common instrument will be subject to individual limits.

4.4.7.2 UDS – SPCI, SPVI, TMOC, TMOV, SFD and SDP

The UDSs will be individually assessed on each leg. In the event of violation of the limit or absence of the limit in the authorized market, the UDSs will be rejected.

4.4.8   Options exercise

The options exercise will not be handled by LiNe Trading, when sending the purpose of the exercise. Only in the execution of the exercise, in order to update the respective limits. The principle is to ensure that any position that has been created can be exercised.

Given that LiNe Trading does not perform validation to allow or not the exercise request to be entered, that market is not among the authorized markets.

5   REST API INTEGRATION

B3 provides access to the risk tool via REST interface web-based protocol to maintain the limits and entities in the LiNe Trading environment. Integrations will be available from Monday to Friday between 7 a.m. and 7 p.m.

The management of functionalities via REST allows participants to integrate the internal tools of each institution into the LiNe Trading via web protocol. The interface is only available for access via RCB.

It should be emphasized that the audit data and the exchange limits will not be available through the REST interface, and can only be used via LiNe Trading web portal or through reports extracted by that portal.

The use of the environment shall be monitored by B3 and may, under its responsibility, reduce or restrict the institution's access to the use of the integration.

5.1   Planned Operations in REST Interface

The planned operations for participants to integrate with LiNe Trading via REST are:

- Consultation of clients/accounts and professional traders linked to the PNP;

- Creation/consultation/editing/exclusion of profiles;

- Creation/consultation/editing/exclusion of limits associated with the profile;

- Creation/consultation/editing/exclusion of entities (clients\accounts\professional traders) associated with the profile;

- Creation/consultation/editing/exclusion of limits (exception) associated with clients\accounts\professional traders linked to the PN;

- Consultation/editing of client in protected mode;

- Consultation/editing of blocked client/account;

- Consultation and warning setups registered in LiNe Trading;

- Receiving warning messages;

- Consumption/position of limits associated with clients/accounts and professional traders;

- Consultation of PNs.

5.2 REST Integration specification

All technical information, description of operations and technical examples are available on B3's website at http://www.b3.com.br/en_us/solutions/platforms/risk-management-line/about-line-5-0/.

6 SYSTEM'S ACCESS AND USABILITY

LiNe Trading risk tool web portal is available to all participants via web link in the RCB network (https://line.bvmnet.com.br). For access control and definition of user profiles the CAU system is used.

Carrying participants, as well as users, who do not have access to B3's extranet and to the CAU system must provide them to access the pre-trading risk tool.

6.1 LiNe Trading web portal

LiNe Trading web portal will be available Monday through Friday from 7 a.m. to 9 p.m., on regular trading days.

6.2 Access management

Access to the LiNe Trading web portal will be through a user in CAU system, so the institution's admin user will be responsible for distributing the profiles available on LiNe Trading to its corresponding users.

6.2.1   Users profiles

In order to segregate responsibilities in the trading participants, there will be six login types with different assignments. The profiles available to participants are:

CAU Profile	LINE Profile
LINE_FIRM-AUD_BVMF	Compliance
LINE_FIRM-MNG-RIS_BVMF	Risk Manager
LINE_FIRM-RIS_BVMF	Risk Analyst
LINE_FIRM-OPE_BVMF	Master Trader
LINE_SVC-FIRM-MNG-RIS-BVMF	Service User

The list of professional traders' user profiles has the following features:

- Compliance - allows to consult reports.

- Risk Manager – allows assigning limits to all trader, account and document, besides this user can consult reports.

- Risk Analyst – Allows assigning limits to all traders and document, the only exception that this user not allowed is audit.

- Trader - allows to consult the limits of all traders, documents and accounts.

- Service User – responsible for all the management performed in the API.

Responsibility Assignment Matrix – LINE 5.0										
Screens:	**Exchange Limits**		**Client Limits**		**Professional Traders Limits**		**Profile Management**		**Audit**	**Reports**
Profile	Consultation	Management	Consultation	Management	Consultation	Management	Consultation	Management	Consultation	Consultation
Compliance									X	X
Risk Manager	X		X	X			X	X	X	X
Risk Analyst	X		X	X			X	X		X
Trader	X		X		X					
Service User	X		X	X	X	X	X	X		X

6.2.2 Service user

There will be in LiNe Trading a service user who will be responsible for accessing and managing API limits, this service user will not be able to access the LiNe Trading portal as the ordinary user will not be able to access the system API.

The request of this user must be done in CAU system, according to the chapter 6. Access and use of the system.

6.3 Warning message module

LiNe Trading features a parameterizable warning screen for the entities' limit consumption and status change which allows the tool manager to monitor its use in order to reduce participants' and clients' trade execution risks and rejection. Warning messages will be generated in the portal warning message window and via REST integration, allowing users to choose how to use them.

Waning messages are divided by category:

- Limit consumption: allows the PNP/PN to parameterize threshold values for the SFD, SDP and risk measures in any of the entities (client, account and professional trader) and receive warning messages via the LiNe Trading web portal when there is a violation of the setup value;

- Order rejection: allows the PNP/PN to receive any rejection from LiNe Trading;

- Protected mode: allows the PNP/PN to receive a warning message when an entity (client/account) enters into protected mode;

- Cap limit reduction: allows the PN to receive a warning message when the PNP reduces the cap limit in the entities (client/account/professional trader);

- Entity blocking: allows the PNP/PN to receive a warning message if there is a block in one of the entities (client/account/professional trader).

7 REPORTS

Through LiNe Trading, the PNP/PN can perform several consultations to generate reports or even for troubleshooting. There will be more than one report screen, but with different perspectives. These reports are:

7.1 Audit

LiNe Trading will have data of up to three months stored on its system. Through LiNe Trading web portal, the PNP/PN may conduct consultations with an audit focus. The data available for the execution of these consultations are:

- Professional trader (user) who edited the limits;

- Altered value measures;

- Entities impacted in limit editing;

- Date of limit update;

- Time of limit update;

- Logon/logout time on the system;

- Warning messages received by the web portal and API;

- Activation of protected mode;

- Professional trader who created/edited/excluded the profile;

- User computer IP address

7.2 Orders rejected by LINE Trading

LiNe Trading will feature default warning messages. One of the messages will be about the rejection of any order arising from lack or extrapolation of limit per entity. The rejection warning message can also be sent via API messaging (REST).

All rejections from LiNe Trading will not be sent to the Drop Copy. Therefore, the follow-ups by trading participants should be performed through the warning messages via screen, API and the Execution report from the trading session.

8   KEY FEATURES AND FUNCTIONALITIES

8.1 New professional traders

LiNe Trading will be integrated into the GHP system. In this case, professional traders who are registered or removed from the BM&FBOVESPA Integrated Registration System (Sincad) will be reflected in the D+1 window.

8.2 Morning tests

B3 provides a daily window from 7:00 a.m. to 8:00 a.m. to trading participants to validate the integrity of their systems with B3. There will be an authorized market responsible for the limits on the test instruments (fictitious instruments) where the PN should also validate the integrity of its systems with LiNe Trading. Further details on the test instruments and their features can be found at Morning Tests.

8.3. New instruments – IPOs, change of ticker and new futures contracts

The trading of new companies will not require the additional setup of trading participants as long as there is permission in the authorized markets to which the instrument is associated. Therefore, all instruments of the new company will have their limits inherited from the authorized market.

In the event of a company's ticker is changed, the exchange limits impacted by this change will be updated automatically. However, there will be no migration of the SPCI, SPVI, TMOC and TMOV measures. Therefore, the PNP/PN should assign a

new limit to those measures. If the instrument's ticker changes and is migrated from the authorized market, the PNP/PN should assign limits to the new authorized market, if it has not done so.

In the event a new futures contract is created, the contract and its options will automatically be associated with its authorized markets and will inherit the due limits.

8.4 New instruments – creation of options online

As the creation of options online for BOVESPA segment is provided on the trading platform, LiNe Trading provides the identification and automatic association of that option with its corresponding group. The reference price for that option will be arbitrated by B3 so that orders without price can use the reference price as a base price. Since association to the option group is automatic, participants do not need any additional setups for the client to trade that option.

8.5 Special auctions

For the participation of trades in special auctions, the PNP/PN must grant permission to the authorized auction market. The schedules and notices for the special auctions can be consulted on B3 website at:

http://www.b3.com.br/en_us/products-and-services/trading/auctions/

8.6 Index portfolio balance

The theoretical index portfolio is valid for four months, for the periods from January to April, May to August, and September to December. At the end of each four-month period, the portfolio is balanced, using the procedures and criteria that are part of the methodology adopted by B3. The PNP/PN should be aware of the instruments that will be impacted by the new index portfolio balance, as this change will have an immediate impact on the authorized LiNe Trading markets. Further information can be found at: Operational Procedure Manual.

8.7 GT orders

GTC/GTD orders that have remained on the system overnight will automatically consume the corresponding limits for opening on the next day's trading as detailed in each risk measure.

8.8 B3's order and trade input procedure

The orders and trades registered by B3's market surveillance at the request of the PNP/PN should have all limits as detailed in this manual. In cases where the order or trade is not broken down in the account, the PNP's capture account will have its limits consumed.

All procedures described in this chapter will follow the rules set forth in the Operational Procedure Manual.

8.9 Group update and limit cleanup

Aiming to maintain the system's prophylaxis, the limits set for expired instruments or instruments no longer traded will be automatically cleared. This cleanup will be performed on the day the instrument is excluded.

Inactive client, account, and participant entities will have their setups excluded if they are deactivated in their source systems. However, cleanup will be done only at week end when the platform maintenance is performed. Give-up and On Behalf links will reflect on the following business day.

The IBRX-100 instrument group will be updated on the day following the announcement of the change in the index composition.

8.10 Trade blocking (panic button)

Trade blocking applies to clients, accounts and professional traders who, once blocked by the executing participant, will have their next orders rejected. Note that this setup will remain until it is unblocked.

8.11 Message treatment priority

Because LiNe Trading is potentially the only trade blocking tool that participants have towards their clients, the system will treat limit management commands as priority over order entry messages. This is a caution point to the number of limit management commands to be performed by participants during the day.

8.12 Operation modes

To enable the phased migration and the parallel production period, LiNe Trading will feature four operation modes:

• Off - In this mode, LiNe Trading will not perform any validation or deduction of limits before sending the order to the trading engine. No rejection by limit will be effected;

• Parallel production - In this mode, LiNe Trading will not perform any validation before sending the order to the trading engine, but will calculate the limits that can be tracked via web portal or REST interface.

• Operational production – It is LiNe Trading operational mode in which validations will be performed and limit consumption will be updated before sending the order to the trading engine; and

• Blocked – It is LiNe Trading operational mode in which any order sent to LiNe Trading will be rejected.

9 ERROR CODES GENERATED BY THE SYSTEM

The rejections generated by LiNe Trading are in the FIX Specification guides. That is, they are send through the message types: Execution Report (35=8); OrderCancelReject (35=9); QuoteRequestReject (35=AG); and QuoteStatusReport (35=AI).

Messages are generated by the Gateway Line plugin and sent to clients in the following scenarios:

- Notice of rejection by the risk engine to an order sent to it for evaluation;

- Insufficient data in the FIX message for routing to the risk engine; and

- Communication problems between plugin and risk engine.

Errors and associated codes follow the standard defined for the EntryPoint Specification of the PUMA Trading System platform: Entrypoint: Error Codes - version 1.0.10.

FIX Message	Details
ExecutionReport (35=8)	Used to reject NewOrderSingle (35=D) and NewOrderCross (35=s). Fields for rejection information: OrdRejReason (35=103) – Int (6). Text (58) – Free format text string (250). Used to reject OrderCancelReplaceRequest (35=G).
OrderCancelReject (35=9)	Used to reject OrderCancelReplaceRequest (35=G). Fields for rejection information: CxlRejReason (102) – Int (6). Text (58) – Free format text string (250).
QuoteRequestReject (35=AG)	Used to reject QuoteRequest (R). Fields for rejection information: QuoteRequestRejectReason (658) – Int (6). Text (58) – Free format text string (250).
QuoteStatusReport (35=AI)	Used to reject Quote (S). Fields for rejection information: QuoteRejectReason (300) – Int (6). Text (58) – Free format text string (250).

For LiNe Trading system, the error codes prefixes are:

030xxx -> Error code for rejections generated by the risk engine arising from normal orders and execution of a give-up Link.

031xxx -> Error code for rejections generated by the risk engine arising from the violation of measures in the carrying.

032xxx -> Error code for rejections generated by the LINE plugin on the gateway.

The document Entrypoint Error Codes has the rejection list from LiNe Trading and can be found as follows:

http://www.b3.com.br/en_us/solutions/platforms/puma-trading-system/for-developers-and-vendors/entrypoint-order-entry/

10. ELEMENTS NOT SUPPORTED BY LINE TRADING

10.1 Accounts segment - SINCAD

As explained in chapter 3.3, Features and Enhancements of this document, LiNe Trading will be integrated with SINCAD. This integration is required for managing clients and accounts linked to trading participants through SINCAD, where the participant can define the products that can be allocated via RTC system. This permission made at SINCAD will not be reflected in LiNe Trading, therefore, it is through SINCAD that the PNP, PN or PL parameterizes the restriction of the markets that can be allocated, and it will be through the authorized market that the PNP, PN or carrying may restrict the authorized markets allowed for trading on the trading platform.

10.2 Account types and their treatment in LINE Trading

In addition to the segment definitions performed in SINCAD, the PNP/PN/PL can change the status of the accounts (as shown in the table below). These account status are used by B3's Post-Trading systems in order to validate the allocation rules. However, these characteristics are not reflected in the system in the same way that is done in Post-Trading, due to the treatment LiNe Trading makes on these account status (active and inactive) for trading.

The table below shows all types of accounts and their possible trading status for LiNe Trading.

Treatment of Status in SINCAD's Accounts							
SINCAD Domain		LiNe Trading Domain	Accounts Status				
Code	Description	Treated by LiNe	Active	* Partially Suspended	* Suspended	Inactivation	Inactive
1	Normal	Yes	Yes	Yes	Yes	Yes	No
3	Error	Yes	Yes	Yes	Yes	Yes	No
11	Operational Error	Yes	Yes	Yes	Yes	Yes	No
2	Master	Yes	Yes	Yes	Yes	Yes	No
6	Brokerage	Yes	Yes	Yes	Yes	Yes	No
10	AdminCon	Yes	Yes	Yes	Yes	Yes	No
20	Intermediary	Yes	Yes	Yes	Yes	Yes	No
21	Fintermo	Yes	Yes	Yes	Yes	Yes	No
22	Transitory for FM	Yes	Yes	Yes	Yes	Yes	No
24	Transition Account	Yes	Yes	Yes	Yes	Yes	No
7	Capture	Yes	Yes	Yes	Yes	Yes	No

11. DEDICATED LINE RISK ENGINE

B3's LINE Risk Engine is a tool that allows Full Trading Participants (PNPs) to set pre-trading limits and monitor trades from investors in the markets managed by B3. Its architecture enables investors to centralize pre-trading risk calculation of the entire order flow allocated to participants. The LINE Risk Engine assesses limits beforehand in order to authorize or not the order to the trading engine