

BM&FBOVESPA

A Nova Bolsa



**PRINCIPLES FOR FINANCIAL MARKET
INFRASTRUCTURES**

BM&FBOVESPA INFORMATION DISCLOSURE

August 2017

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IMPORTANT ADVISORY ABOUT BM&FBOVESPA'S PFMI DISCLOSURE

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I – EXECUTIVE SUMMARY

In April 2012, the Committee on Payment and Settlement Systems of the Bank for International Settlements (CPSS/BIS) and the Technical Committee of the International Organization of Securities Commissions (TC/IOSCO) published the standards report “Principles for financial market infrastructures” (PFMI), which harmonized and replaced the existing international standards applicable to FMIs. In December 2012, the CPSS and IOSCO published “Principles for financial market infrastructures: Disclosure framework and Assessment methodology”, with the aim of promoting consistent disclosures of information by FMIs and consistent assessments by international financial institutions and national authorities.

BM&FBOVESPA completed its first self-assessment in compliance with the PFMI in December 2013. In first-half 2017 it published the first disclosure to the general public in accordance with the disclosure framework proposed by the CPSS and IOSCO. This is the second disclosure, adding to the first the changes relating to integration of the markets for cash equities, corporate bonds, equity derivatives and securities lending into BM&FBOVESPA Clearinghouse.

This publication refers to two clearinghouses – BM&FBOVESPA Clearinghouse and BM&FBOVESPA’s Foreign Exchange Clearinghouse – as well as BM&FBOVESPA Central Securities Depository (CSD) and the iBalcão registration system for over-the-counter derivatives and financial assets. With regard to some principles, however, reference is made to information, services, responsibilities and other aspects of BM&FBOVESPA as a whole. BM&FBOVESPA’s activities relating to the securities settlement system (SSS) and payment system (PS), where applicable, are integrated with the activities of BM&FBOVESPA’s clearinghouses, which act as a central counterparty (CCP). These functions are therefore considered a single FMI in this report. This view is based on “Principles for financial market infrastructures: Disclosure framework and Assessment methodology”, CPSS-IOSCO, December 2012, p. 8: *“Two or more FMIs are integrated into one entity. A single operator might operate two FMIs whose key functions are highly interrelated and complementary, such as a CSD that operates an SSS. If the CSD and SSS share the same legal and governance arrangements and use highly integrated operational and risk management arrangements, then the two key functions could be assessed as if they were one FMI.”*

II – SUMMARY OF MAJOR CHANGES SINCE THE LAST UPDATE OF THE DISCLOSURE

The main changes to this document compared with the first disclosure relate to integration of the markets for cash equities, corporate bonds, equity derivatives and securities lending into BM&FBOVESPA Clearinghouse. They refer to alterations to the method for calculating the operating balance that take into consideration certain features of the cash equities market, the list of assets accepted as collateral and the method for calculating contributions to the settlement fund, as well as the creation of an additional mechanism to supply liquidity to the clearinghouse (FILCB – Fundo de Investimento Liquidez Câmara BM&FBOVESPA). Besides these changes, updates have been made to items on governance in light of the merger between BM&FBOVESPA and CETIP; the document reflects the Central Bank of Brazil's permission for collateral to be posted abroad by non-resident investors; and references to the legal basis have been updated in connection with the centralized registration and depositing of financial assets and securities.

III – GENERAL BACKGROUND ON BM&FBOVESPA

BM&FBOVESPA S.A. — SECURITIES, COMMODITIES AND FUTURES EXCHANGE (BM&FBOVESPA) is a vertically integrated multi-asset multi-market exchange that provides trading, registration, central securities depository, clearing and settlement services, acting as central counterparty to guarantee cash settlement of transactions. Its vertically integrated business model offers customers and participants the infrastructure required to process transactions through all stages from pre-trading to trading and post-trading at the level of the individual customer.

Created in 2008 as a publicly held company that integrated BM&F (commodities and futures) and BOVESPA (stocks and bonds), it is one of the world's top ten exchanges by market value. It is the only securities, commodities and futures exchange in Brazil and the leading exchange in Latin America. It trades under the ticker symbol BVMF3 on the Novo Mercado premium listing segment for companies committed to the highest standards of corporate governance. Its stock is tracked by the Ibovespa, IBrX-50, IBrX and Itag indices, among others.

BM&FBOVESPA operates an electronic system (PUMA Trading System BM&FBOVESPA) for trading in equities, financial, commodity and equity derivatives, fixed-income securities, federal government debt, and spot currencies, as well as a securities lending system and a system for registering over-the-counter financial assets and derivatives (iBalcão). Its central securities depository function is performed by BM&FBOVESPA Central Depository, while its trade repository (TR) function is performed by iBalcão. BM&FBOVESPA's CCP function is performed by its clearinghouses, which are considered systemically important by the Central Bank of Brazil (BCB):¹

- BM&FBOVESPA Clearinghouse (financial and commodity derivatives, covering the exchange market (futures and options) and the OTC market (swaps, forwards and flexible options), as well as the spot gold market, the cash equities and corporate bonds market, equity derivatives (forwards and options) and securities lending)
- Foreign Exchange Clearinghouse (interbank FX market)
- Securities Clearinghouse (federal government debt market)

BM&FBOVESPA's clearinghouses are recognized by the European Securities and Markets Authority (ESMA) and therefore classified as qualifying central counterparties (QCCP) for the purposes of capital requirements applicable to European financial institutions.

BM&FBOVESPA's clearinghouses and central depository are operational departments and not subsidiaries of BM&FBOVESPA.

BM&FBOVESPA uses the individual customer segregation model for all stages of the trading, registration and post-trading cycles, from participant registration, order insertion into PUMA, pre-trading risk control, registration of transactions in iBalcão, control of positions in clearinghouses and iBalcão, and balances in BM&FBOVESPA Central Depository, risk and collateral management, to the

¹ BM&FBOVESPA's clearinghouses do not operate in other jurisdictions besides Brazil, and BM&FBOVESPA is not aware of relevant authorities in other jurisdictions that consider them systemically important in their respective jurisdictions.

treatment of default and the disclosure of information to participants and regulators. The benefits of this model include enhanced efficiency in managing central counterparty risk and systemic risk, more customer protection, and portability.

BM&FBOVESPA is developing a post-trade integration project to create an integrated clearinghouse that will consolidate the activities of the clearinghouses in operation today, which resulted from the merger of BM&F and BOVESPA. The first stage of the project was completed in 2014 with the establishment of BM&FBOVESPA Clearinghouse, which replaced the former Derivatives Clearinghouse and has a new clearing and settlement platform and a new margin calculation methodology called CORE (Close Out Risk Evaluation). In the second stage of the project, completed in 2017, the scope of BM&FBOVESPA Clearinghouse was extended to equities, corporate bonds, equity derivatives, and securities lending transactions, thus fully replacing the Equities Clearinghouse. With the completion of this stage, BM&FBOVESPA Clearinghouse is responsible for clearing and settling practically all trades executed on the markets operated by BM&FBOVESPA. At the end of the project, BM&FBOVESPA's clearing, settlement and CCP service will have a single set of rules, a single participant structure and register, unified processes for position allocation, clearing and control, a single settlement window, a single risk management system, a single collateral pool, and a single safeguard structure. The benefits for participants will be better liquidity management, more efficient capital allocation, and less operational risk.

The Brazilian financial and capital markets are regulated and supervised by the National Monetary Council (CMN), the Central Bank of Brazil (BCB) and the Securities and Exchange Commission of Brazil (CVM). The regulatory framework in force is based on Law 4595/64 (the National Financial System Law), Law 4728/65 (the Financial and Capital Markets Law), Law 6385/76 (the Securities Law), Law 10214/01 (the Brazilian Payment System Law), Law 12810/13 (the CSD Law), CMN Resolution 2882/01 (regulating the payment system and the clearing and settlement systems), and BCB Circular 3057/01 (on the functioning of clearinghouses). According to the Brazilian regulatory framework, the creation and management of regulated securities markets, settlement and custody systems and trade repository activities require prior authorisation by CVM and/or BCB, depending on the market and on the respective competent legal and regulatory sphere. In January 2014, BCB published Communiqué 25097, announcing that it would henceforth use the PFMI in its monitoring and assessment of the Brazilian Payment System (SPB).

Headquartered in São Paulo, Brazil, BM&FBOVESPA S.A. has representative offices in New York (USA), London (UK) and Shanghai (China). It controls BM&FBOVESPA Market Supervision (a private-law association whose purpose is to supervise the activities of BM&FBOVESPA and its participants in compliance with the applicable rules and regulations), BM&FBOVESPA Bank (a wholly-owned subsidiary whose purpose is to facilitate the clearing and cash settlement of transactions performed in its trading environments), and BM&FBOVESPA Institute (a public-interest civil society organisation whose purpose is to integrate and coordinate BM&FBOVESPA's social investment projects).

IV – ACRONYMS

The following acronyms are used in this document:

BCB	Central Bank of Brazil
BSM	BM&FBOVESPA Market Supervision
CMN	Brazilian National Monetary Council
CORE	Close Out Risk Evaluation
CPSS	Committee on Payment and Settlement Systems
CVM	Securities and Exchange Commission of Brazil
FMI	Financial market infrastructure
IOSCO	International Organization of Securities Commissions
MRP	Investor Compensation Mechanism
PQO	Operational Qualification Program
SPB	Brazilian Payment System
STR	Reserve Transfer System

V – PRINCIPLE-BY-PRINCIPLE DISCLOSURE

PRINCIPLE 1 – LEGAL BASIS

PRINCIPLE 1 – LEGAL BASIS: *An FMI should have a well-founded, clear, transparent, and enforceable legal basis for each material aspect of its activities in all relevant jurisdictions.*

Key Consideration 1 - *The legal basis should provide a high degree of certainty for each material aspect of an FMI's activities in all relevant jurisdictions.*

Brazilian jurisdiction

The Brazilian jurisdiction is of paramount importance to BM&FBOVESPA's activities as a clearinghouse and central counterparty (CCP), central securities depository (CSD) and trade repository (TR), since it is a corporation established in Brazil in accordance with Brazilian laws and the above activities are performed in Brazil. The legal basis currently existing in Brazil provides a high degree of certainty for each material aspect of these activities, as discussed in the following items.

The regulatory framework that disciplines the financial and capital markets in Brazil is based on the following laws:

- Law 4595/64 – National Financial System Law
- Law 4728/65 – Financial and Capital Markets Law
- Law 6385/76 – Securities Law
- Law 10214/01 – SPB Law
- Law 12810/13 – CSD and Trade Repository Law

CMN, BCB and CVM are the main bodies responsible for regulating activities performed in the financial and capital markets, and for supervising the participants in such markets in their respective spheres of competence.

CMN is the highest regulatory body and the highest authority for the financial and capital markets in Brazil. Its members are the Minister of Finance, the Minister of Planning, Budgeting & Administration, and the Governor of the BCB. CMN was established with the specific purpose of formulating monetary, exchange-rate and credit policies as guidance for the financial and capital markets, among other goals, and in this capacity it decides on matters such as the availability of credit, the operating limits applicable to financial institutions, the rules for foreign investment in Brazil, and foreign-exchange norms.

BCB is a semi-autonomous federal entity empowered to implement the monetary, exchange-rate and credit policies formulated by CMN, regulate the foreign-exchange market and the flow of foreign funds into and out of Brazil, authorise and supervise the functioning of financial institutions, and

perform surveillance, oversight and inspection of all financial institutions operating in Brazil, both public and private. BCB is empowered to impose penalties. Its Governor is appointed by the President of the Republic for an indefinite term. The appointment must be confirmed by the Senate.

BCB is a member of the Bank for International Settlements (BIS), the Committee on Payment and Settlement Systems (CPSS), the Basel Committee on Banking Supervision (BCBS), the Committee on the Global Financial System (CGFS), the Markets Committee, and the Irving Fisher Committee on Central Bank Statistics (IFC).

CVM is a semi-autonomous federal entity empowered to regulate, control and oversee the capital markets in Brazil. Financial and other institutions authorised to operate by BCB are also subject to CVM's regulatory authority insofar as they act as providers of investment services to participants in these markets, including securities subscription, distribution and placement, as well as order transmission. CVM also performs the critical task of overseeing the activities of public companies, of the exchange and over-the-counter (OTC) securities markets, and of members of the securities dealing system, including fund managers and asset managers.

CVM is a regular member of the International Organization of Securities Commissions (IOSCO) and an active participant in the development of international business standards. CVM is a member of all eight IOSCO Policy Committees. It is also a signatory to the IOSCO Multilateral Memorandum of Understanding (MMoU).

BM&FBOVESPA and its self-regulation arm are associate members of IOSCO.

As members of IOSCO and CPSS respectively, CVM and BCB are active participants in the global benchmarking initiative represented by the Principles for Financial Market Infrastructures, published in 2012 by CPSS and IOSCO's Technical Committee. The June 2015 PFMI implementation assessment report issued by CPSS and OICV-IOSCO (*Implementation monitoring of PFMIs: Second update to Level 1 assessment report*, p. 12) awards Brazil Rating 4, the highest possible, indicating that final implementation measures are in force. This status corresponds to cases where, in addition to the required implementation measures having been finalised and approved/adopted, FMIs are expected to observe the Principles or authorities to observe the Responsibilities included in the PFMIs. Brazil was again given Rating 4 in the updates published in June 2016 and July 2017.

CVM and BCB are members of the Financial Stability Board (FSB), established to coordinate at the international level the work done by national financial authorities and international standard setting bodies to develop and promote the implementation of effective regulatory, supervisory and other policies for the financial sector.

According to the Brazilian regulatory framework, the creation and management of organised securities markets, clearing and settlement systems, as well as the activities of CCPs, CSDs and TRs, require prior authorisation by CVM and/or BCB, depending on the market and the respective sphere of legal and regulatory competence.

BCB and CVM are empowered to exercise regulatory supervision of BM&FBOVESPA. BCB is the authority most intensely involved in the supervision, regulation and surveillance of BM&FBOVESPA's clearinghouses, especially with regard to risk management, and also the regulatory authority for

BM&FBOVESPA Bank for Settlement and Custody Services (BM&FBOVESPA Bank), a subsidiary of BM&FBOVESPA that participates in the activities of BM&FBOVESPA's clearinghouses as one of the settlement agents engaged by clearing members and providers of support services relating to collateral management and transaction settlement processing.

BCB and CVM use the PFMI in supervising, monitoring and assessing the entities they authorise to operate, as evidenced by CVM Instruction 461/07 (amended by CVM Instruction 544/13) and BCB Communiqués 25097/14 and 27115/15. Every year BCB issues a list of the entities that belong to the Brazilian Payment System (SPB) and are submitted to its inspection, monitoring and assessment, as per the regulatory documents just mentioned. See also BCB Communiqués 25164/14, 27115/15, 29078/16 and 30516/17.

Legal basis for BM&FBOVESPA's activities

BM&FBOVESPA's clearinghouse, CSD and TR activities are formally authorised by the competent Brazilian regulatory authorities, specifically CMN, BCB and CVM, pursuant to the laws listed at the start of this Key Consideration and to CMN Resolution 2882/01, BCB Circular 3057/01 and CVM Instruction 461/07. The following documents contain the requisite authorisations: BCB Communiqués 9419/02, 12789/04, 13750/05, 25097/14, 29078/16 and 26265/14, and CVM/SMI Official Letters 018/09 and 101/15.

According to Law 9613/98, articles 9 and 10, and CVM Instruction 301/99, article 3, exchanges and clearinghouses are obliged to identify financial beneficial owners and monitor their transactions.

As an operator of organised markets, BM&FBOVESPA is authorised to be self-regulating in accordance with the aforementioned legislation, which is enhanced by means of its rulebooks and manuals.

The following items detail the legal basis for each material aspect of BM&FBOVESPA's activities as an operator of organised securities markets, clearinghouses and CCP, CSD and TR, and as a self-regulatory organisation.

a) BM&FBOVESPA's activities as an operator of organised securities markets

CVM classifies an organised securities market as an "organised exchange" or as an "organised over-the-counter market", depending mainly on the pricing rules used by the respective trading systems, the volume traded on these systems, and the type of investor targeted by each market. BM&FBOVESPA operates as an entity that manages organised securities markets in the organised exchange and organised over-the-counter market categories.

The main set of rules applicable to organised exchange and OTC markets in Brazil is CVM Instruction 461/07, which regulates their functioning and also requires that these markets adopt self-regulation mechanisms. The main features of an organised exchange or organised OTC market are stipulated in articles 65 and 92 of this Instruction respectively.

b) BM&FBOVESPA's clearinghouse activities

Law 10214/01, CMN Resolution 2882/01 and BCB Circular 3057/01 primarily establish the legal framework for the activities of clearinghouses as part of the SPB. These norms define the concepts of multilateral netting, settlement, contract novation (via substitution of counterparties), and the rights and obligations of the contracting parties. In addition, they recognize the unconditional and irrevocable nature of settlement, and assure preference for clearinghouses in disposing of assets pledged as collateral in the event of settlement default.

According to the above legislation, BCB is required to assure the continuity and development of the SPB, and is empowered to authorise and regulate the clearing and settlement systems operated by clearinghouses considered systemically important.

BCB shares this competence with CVM as far as the settlement of securities transactions is concerned (but not for the settlement of transactions involving federal government bonds and debt securities issued by private banks). Exercising the regulatory powers attributed to it by the above legal and regulatory framework, CVM has issued several norms applicable to the Brazilian capital markets, including CVM Instruction 461/07, which disciplines the regulated securities markets and governs the formation, organisation, functioning and dissolution of stock exchanges, commodity and futures exchanges, and organised and non-organised markets.

Relevant aspect	Legislation	BM&FBOVESPA Clearinghouse Rulebook	Foreign Exchange Clearinghouse Rulebook
Classification as a systemically important system	Law 10214 CMN Resolution 2882 BCB Circular 3057	-	-
Multilateral netting	Law 10214 BCB Circular 3057	Tit. II, Chap. III, Section V	Chap. VII
Settlement	Law 10214 CMN Resolution 2882 BCB Circular 3057	Tit. II, Chap. III, Sections VI, VII & VIII	Chap. VIII
Individual customer segregation model	Law 9613 ICVM 301 ICVM 505	Tit. II, Chap. III, Section IV	-
Novation	Law 10214 BCB Circular 3057	Tit. II, Chap. III, Section I	Art. 11
Irrevocable and unconditional settlement of obligations	Law 10214 BCB Circular 3057	Tit. II, Chap. I, Sole Section, Art.10	Art. 21
Closeout of positions in the event of default	BCB Circular 3057	Tit. II, Chap. V	Chap. VIII, Section III
Safeguards and collateral	Law 10214 BCB Circular 3057	Tit. II, Chap. IV	Chap. IX
Chain of responsibilities	-	Tit. II, Chap. II	Chap. III

Relevant aspect	Legislation	BM&FBOVESPA Clearinghouse Rulebook	Foreign Exchange Clearinghouse Rulebook
Confidentiality	Supplementary Law 105	-	-

c) *BM&FBOVESPA's activities as a Central Depository for securities and financial assets*

In addition to the above legal framework, the following also govern CSD activities in Brazil: Law 6404/76, Law 12810/13, CVM Instructions 541/13, 542/13 and 543/13, BCB Circular 3743/15, and CMN Resolution 4593/17.

- Law 12810/13 (the CSD Law) governs CSD activities and the registration of securities and financial assets. It empowers BCB and CVM, each within its respective sphere of competence, to authorise and supervise the activities of CSDs, and to establish the conditions in which such activities shall be carried out. It states that the centralised deposit services provided by entities licensed to operate as CSDs comprise the centralised safekeeping of financial assets and securities, fungible or non-fungible, control of their effective ownership, and treatment of their events. It also states that these entities are responsible for the integrity of their systems and of the records corresponding to the financial assets and securities held by them as CSDs. It requires fiduciary transfer of title in all such financial assets and securities to the CSD in question.
- According to CVM Instruction 541/13, securities deposited in accounts with the CSD are represented and transferred only in the form of ledger entries booked to the accounts concerned. In addition, the constitution of security interests, liens or encumbrances on securities deposited with CSDs is governed by Law 12810/13, article 26. CVM Instruction 542/13 establishes the requirements for an institution to obtain a license to operate as a custodian under the structure of a CSD, and CVM Instruction 543/13 contains the rules for service provision by securities registrars and issuers of securities certificates.
- Article 26 of Law 12810/13 states that the constitution of security interests, liens and encumbrances on financial assets and securities for registration or depositing with CSDs, whether individually or universally, including for purposes of publicity and efficacy in relations with third parties, may be performed solely by means of their registration with the registration entities or CSDs where they are registered or deposited, regardless of the legal nature of the transaction involved, and that any such instrument must also be registered whenever the law requires a specific deed or agreement in order to constitute a lien or security interest.
- Article 13 of CVM Instruction 461/07 states that stock exchanges may provide clearing, settlement and custody services themselves, provided they are authorised to do so by CVM.
- BCB Circular 3743/15 establishes specific requirements for centralised deposit services involving financial assets. Based on the provisions of Law 10214/01, article 10, and Law 12810/13, articles 22, 26 and 28, this circular regulates registration and central depository activities for financial assets and the establishment of encumbrances and liens on deposited financial assets.

- CMN Resolution 4593/2017 deals with registration and central depository activities for financial assets and securities by financial institutions and other institutions licensed by the Central Bank of Brazil.

Relevant aspects	Legislation	BM&FBOVESPA Central Depository Rulebook
CSD	Law 4728 Law 6385 Law 12810 ICVM 541 ICVM 544 BCB Circular 3743 CMN Resolution 4593	Title II
Individual customer segregation model	Law 9613 ICVM 301 ICVM 541	Art. 2, sole paragraph, item III Art. 5, item II & first paragraph Art. 15 and ff.
Fiduciary ownership	Law 4728 Law 6404 Law 6385 Law 12810 ICVM 541 ICVM 544 BCB Circular 3743	Art. 2, sole paragraph, items I, II, III Art. 5, items V, VI, X and XI, and first paragraph Art. 18 Art. 19 Art. 23
Confidentiality	Supplementary Law 105	Art. 39, item XLIII

d) BM&FBOVESPA's TR activities

Law 12810/13, article 28, defines the registration of financial assets and securities, and stipulates that it includes the recording and safekeeping of information on financial transactions, as well as the disclosure of such information except where subject to secrecy laws.

CVM Instruction 544/13, amending CVM Instruction 461/07, deals with securities registration and trading activities, clarifying that to comply with registration obligations (e.g. the ruling that registration of a derivative is a condition of its validity) it suffices to register the transaction or security in an organised OTC market.

CMN Resolution 4593/2017 deals with registration and central depository activities for financial assets and securities by financial institutions and other institutions licensed by the Central Bank of Brazil, establishing the conditions under which registration and centralised depositing of financial assets and securities are required for financial institutions and other entities specified therein.

Relevant aspects	Legislation	BM&FBOVESPA Clearinghouse Rulebook	Foreign Exchange Clearinghouse Rulebook	iBalcão Rulebook*
Derivatives TR	Law 10214 CMN Resolution 2882 BCB Circular 3057 Law 6385 Law 12810 BCB Circular 3743	Tit. I, Sole Chap. Tit. II, Chap. III, Section IV	Chap. I, item 44 Chap. IV	Chaps. I, II and IV
Individual customer segregation model	Law 9613 ICVM 301	Tit. II, Chap. III, Section IV	Chap. III, art. 5 Chap. IV, art. 8, §2, §3 and §9	-
Confidentiality	LC 105	-	-	-

* BM&FBOVESPA Trade Repository Rulebook

e) Self-regulation function

Organised securities markets, clearinghouses, CSDs and TRs are considered ancillary organs of BCB and CVM in performing market surveillance, which they do by exercising the self-regulatory authority delegated to them to supervise the conduct of the intermediaries and other financial institutions that operate in their markets, as well as the transactions involving securities executed in these markets, as set forth below.

Entities that manage organised securities markets must issue specific norms that regulate securities trading and registration in their markets, as well as clearing, settlement and centralised custody. In BM&FBOVESPA's case, these norms are embodied in its rulebooks, manuals, circular letters and external communications, issued in accordance with procedures based on case-by-case evaluation for drafting, approval by the regulators and publication to the market.

To assure the independence of the self-regulation function, on one hand, and segregation from operating activities, on the other, CVM Instruction 461/07 allows operators of organised markets to choose one of the following options:

- creation of a specific self-regulation structure comprising a department of self-regulation, a chief regulatory officer and a self-regulation board
- incorporation of a special-purpose vehicle
- engagement of an independent third party.

BM&FBOVESPA chose to incorporate a special-purpose vehicle, BSM, which performs the requisite self-regulation activities.

BSM supervises the markets managed by BM&FBOVESPA to assure compliance with legal, regulatory and operational norms, and hence also to assure adequate functioning of the market. Its main

activities are supervising the transactions performed in BM&FBOVESPA's markets (market surveillance), the parties authorised to trade on BM&FBOVESPA's markets (supervision of users) and the activities of BM&FBOVESPA's operating areas, as well as monitoring trading in securities issued by BM&FBOVESPA.

BSM is also responsible for administration of the Investor Compensation Mechanism (MRP), established in accordance with CVM Instruction 461/07 to ensure that investors are compensated for losses resulting from action or omission attributable to users of its markets in the course of trading, brokerage and custody activities.

Other jurisdictions

The only material aspects of BM&FBOVESPA's activities to be taken into consideration with regard to other relevant jurisdictions besides Brazil are the posting of collateral abroad and settlement in United States Dollars (USD).

On the posting of collateral abroad, the following applies:

- In connection with BM&FBOVESPA Clearinghouse, non-resident investors trading pursuant to CMN Resolutions 4373/14 or 2687/00 may post collateral abroad in accordance with the terms and conditions established by BM&FBOVESPA Clearinghouse Rules and Risk Management Manual, and respecting the limit established by CMN Resolution 4569/17 and BCB Circular 3838/17. On August 28, 2017, the collateral deposited abroad (R\$3 billion) corresponded to 1.2% of the total amount of collateral pledged to BM&FBOVESPA Clearinghouse (R\$263 billion). A study on acceptance of collateral posted abroad conducted by BM&FBOVESPA, which commissioned legal memoranda from foreign and domestic law firms, concluded that such collateral enjoys the same legal certainty and the same degree of enforceability as collateral constituted in Brazil relative to certain types of collateral posted by certain types of non-resident investors domiciled in the United States, United Kingdom or France.
- In connection with the Foreign Exchange Clearinghouse, participants may constitute collateral by depositing USD in an account held by BM&FBOVESPA with a bank established in the USA. On August 28, 2017, the collateral deposited abroad (R\$158 million) corresponded to 2.35% of the total amount of collateral pledged to the Foreign Exchange Clearinghouse (R\$6.7 billion).

With regard to settlement in USD, please refer to the answers in the section on Principle 8 – Settlement Finality.

Confidentiality and legal and regulatory framework on AML/CFT

With regard to data access, confidentiality and disclosure, CVM Instruction 461/07 determines the minimum requirements and how information is to be made available to regulators (articles 62, 76 and 105). According to Supplementary Law 105/01, which applies to exchanges, financial intermediaries and financial institutions, the general rule is that confidential information must not be disclosed or published, with some exceptions. Any information conveyed to BCB and CVM by force of law or regulation must remain confidential and cannot be disclosed to third parties.

Law 9613/98 provides for measures that financial institutions and clearinghouses, among others, are obliged to implement in order to prevent the use of the financial system for money laundering and terrorism financing. It defines money laundering crimes, stipulates preventive measures and a system for communicating suspicious occurrences, and calls for international cooperation procedures.

Decree 5640/05 made public the International Convention for the Suppression of the Financing of Terrorism, adopted by the United Nations General Assembly on December 9, 1999, and signed by Brazil on November 10, 2001. CVM Instruction 301/99 and CVM/SMI Official Letter 05/2015 require institutions under CVM's supervision to notify the Finance Ministry's Financial Activity Control Council (COAF) if they detect transactions that might relate to money laundering or terrorism financing.

RFB Rule 1571/15 requires entities under the supervision of BCB and CVM to report periodically to the Finance Ministry's Department of Federal Revenue (RFB) on all financial transactions by individual customers, with the aim of predicting and suppressing money laundering.

Key Consideration 2 - *An FMI should have rules, procedures, and contracts that are clear, understandable, and consistent with relevant laws and regulations.*

The rules and procedures for BM&FBOVESPA's clearinghouse, CSD and TR activities, as well as the contracts that can be traded and/or registered through its trading and/or registration systems, are approved by BCB and/or CVM, in accordance with the markets involved and with the respective legal and regulatory competences.

These rules, procedures and contracts are sent to participants electronically (by email), through circular letters or external communications when they are issued for the first time or amended, and can be read on BM&FBOVESPA's website in Portuguese and English. New rules and amendments to existing rules are published in the daily bulletin, also available from BM&FBOVESPA's website, as soon as they are issued and disclosed to the market.

BM&FBOVESPA believes participants know and understand the rules and procedures: it regularly audits participants and periodically submits participants' employees to tests it prepares for each audited area (nine different tests) as part of its Operational Qualification Program (PQO).

BM&FBOVESPA has an area dedicated to relations with and development of participants. This department is responsible for clarifying questions about rules, procedures, contracts and systems, among others. In addition, all operational areas of BM&FBOVESPA are available to participants for clarifications about the rules and procedures in force.

BM&FBOVESPA engages actively with participants by discussing relevant new rules and procedures, as well as alterations to existing ones.

BM&FBOVESPA assures the consistency of its rules, procedures and contracts with relevant laws and regulations. Legal opinions on specific issues may be commissioned from outside advisors or lawyers. BM&FBOVESPA is not aware of any inconsistencies between its rules, procedures and contracts and the applicable laws and regulations. It should be noted that although BM&FBOVESPA Clearinghouse

began operating in 2014, it provides services for the same contracts and in accordance with most of the same procedures and rules as the extinct Derivatives Clearinghouse, which operated between 1986 and 2014.

The fact that BM&FBOVESPA's rules, procedures and contracts do not enter into force until they have been approved by the regulatory authorities minimises the risk of inconsistencies. Any inconsistencies that may be identified are taken to the regulators for discussion, and as appropriate the rules, procedures and contracts are reviewed, amended and resubmitted for approval by the regulators.

Pursuant to the regulation presented in Key Consideration 1, BM&FBOVESPA's rules, procedures and contracts are approved by the regulatory authorities (BCB and/or CVM depending on the markets involved and the respective legal and regulatory spheres of competence) before entering into force.

Key Consideration 3 - *An FMI should be able to articulate the legal basis for its activities to relevant authorities, participants, and, where relevant, participants' customers, in a clear and understandable way.*

BM&FBOVESPA maintains constant communication with the regulatory authorities, participants and, where relevant, customers in a clear and understandable way about the legal basis for the activities it performs.

BM&FBOVESPA discusses such matters with and within its advisory committees, made up of participants and academics, among others, and also submits proposed rules to the regulatory authorities and participants in order to receive their feedback. In addition, BM&FBOVESPA discloses to the market its views on relevant new laws and regulations after analysis by the regulators.

Key Consideration 4 - *An FMI should have rules, procedures, and contracts that are enforceable in all relevant jurisdictions. There should be a high degree of certainty that actions taken by the FMI under such rules and procedures will not be voided, reversed, or subject to stays.*

BM&FBOVESPA has rules, procedures and contracts that are enforceable in the jurisdiction most relevant to its activities, which is the Brazilian jurisdiction. There is a high degree of certainty that its actions will not be voided or reversed in any way.

BM&FBOVESPA's rules, procedures and contracts follow the laws of Brazil, so that their enforceability is governed by Brazil's legal and regulatory structure, described in the answers to Key Consideration 1, and they are applicable in the Brazilian jurisdiction to its participants, including non-resident investors. With regard to collateral posted abroad, see the specific reference under Key Consideration 1.

BM&FBOVESPA has its own legal department and uses outside advice to support the department whenever appropriate.

All material issues are legally addressed, and the details are regulated by norms issued by BCB and CVM, as well as BM&FBOVESPA's own rulebooks and operating manuals.

BM&FBOVESPA is confident that its own rulebooks and operating manuals are clear, above all because they comply with the applicable laws and regulations.

Given the legal and regulatory framework described above (see Key Consideration 1), BM&FBOVESPA offers a high degree of certainty that its rules, procedures and contracts are not subject to voiding, reversal or stays.

BM&FBOVESPA's rules and procedures are derived from law and are based on legal and regulatory provisions.

To date no court has held unenforceable any of the arrangements adopted in BM&FBOVESPA's clearinghouse, CSD or TR activities in accordance with the applicable laws and procedures.

Key Consideration 5 - *An FMI conducting business in multiple jurisdictions should identify and mitigate the risks arising from any potential conflict of laws across jurisdictions.*

BM&FBOVESPA does not operate in multiple jurisdictions. In fact, it does not conduct business in any jurisdictions other than Brazil.

In the event of uncertainty as to the applicable laws, BM&FBOVESPA's Legal Department analyses the issue and decides on the appropriate course of action, engaging outside consultants or law firms if necessary.

PRINCIPLE 2 – GOVERNANCE

PRINCIPLE 2 – GOVERNANCE: *An FMI should have governance arrangements that are clear and transparent, promote the safety and efficiency of the FMI, and support the stability of the broader financial system, other relevant public interest considerations, and the objectives of relevant stakeholders.*

Key Consideration 1 - *An FMI should have objectives that place a high priority on the safety and efficiency of the FMI and explicitly support financial stability and other relevant public interest considerations*

BM&FBOVESPA has objectives that place a high priority on its safety and efficiency, and explicitly support financial stability and other relevant public interest considerations.

BM&FBOVESPA's Bylaws, which are available from the investor relations website (ri.bmfbovespa.com.br), formally express the following corporate purposes:

- I. Management of organised securities markets, assuring the organisation, operation, maintenance and development of free and open markets for the trading of any and all types of securities or contracts based on or backed by financial assets, indices, rates, commodities, currencies, energy products, transportation products, commodities, and other assets or rights directly or indirectly related thereto, for spot or future settlement;
- II. Maintenance of environments and systems appropriate for trading, auctions and special transactions involving securities, rights and assets in the exchange and organised OTC markets;
- III. Provision of registration, clearing, and physical and financial settlement services through an internal facility or a company specifically organised for this purpose, which may or may not act as central counterparty and guarantor of final settlement, pursuant to applicable legislation and its own rules, in connection with:
 - a. Transactions carried out and/or registered in any of the environments or systems listed in items "I" and "II" above; or,
 - b. Transactions carried out and/or registered with other exchanges, markets or trading systems;
- IV. Provision of central depository and fungible and non-fungible custody services for commodities, securities, and other physical and financial assets;
- V. Provision of services relating to standardisation, classification and grading, analysis, quotations, statistics, professional training, research, publications, information, libraries and software development relating to subjects of interest to BM&FBOVESPA and participants in the markets it manages directly or indirectly;

- VI. Provision of technical, administrative and managerial support for the purposes of market development, and educational, promotional and publishing activities relating to its corporate objectives and the markets it manages;
- VII. Provision of services to effect the registration of liens and encumbrances (security interests) on securities and other financial instruments, including registration of instruments constituting collateral, in compliance with the applicable rules and regulations;
- VIII. Provision of services associated with support for credit, financing and leasing operations, including by means of the development and operation of information technology and data processing systems, involving the automotive vehicle and real estate segments, among others, in compliance with the applicable rules and regulations;
- IX. The construction of a database and related activities;
- X. Other activities authorised by CVM or BCB, which the Board of Directors considers to further the interests of participants in the markets managed by the Company and to contribute to their development and health;
- XI. Participation in other companies or associations based in Brazil or abroad, as a member, partner or shareholder, albeit not necessarily as controlling shareholder, provided their core activities are those expressly mentioned in the Company's Bylaws or the Board of Directors regards such participation as furthering the interests of participants in the markets managed by the Company and contributing to their development and health.

Also according to BM&FBOVESPA's Bylaws, in exercising the powers granted to it by Law 6385/76 and the applicable rules and regulations, BM&FBOVESPA is charged with:

- (i) Regulating the granting of permits for access to the trading, registration, and settlement systems managed by BM&FBOVESPA or its subsidiaries (access permits), and setting the terms, conditions and procedures for the granting of such permits in rules for access to such markets (Access Rules);
- (ii) Establishing rules to preserve the principles of fair trading and ensure that high ethical standards are observed by persons that operate on the markets it manages, directly or indirectly, as well as regulating trading activities and resolving operational issues involving the holders of access permits;
- (iii) Regulating the activities access permit holders may perform in the markets and systems managed by BM&FBOVESPA;
- (iv) Establishing mechanisms and rules designed to mitigate the risk of failure by access permit holders to discharge obligations assumed in respect of transactions executed and/or registered in any of its trading, registration, clearing and settlement environments or systems;
- (v) Monitoring the transactions carried out and/or registered in any of its trading, registration, clearing and settlement environments or systems, as well as all those it regulates;

- (vi) Monitoring the activities of access permit holders, as customers and/or intermediaries to the transactions executed and/or registered in any of its trading, registration, clearing and settlement environments or systems, as well as all those it regulates;
- (vii) Applying penalties for infringement of the legal, regulatory and operating rules that BM&FBOVESPA is responsible for enforcing.

With regard to BM&FBOVESPA Clearinghouse, article 1 (1) of the BM&FBOVESPA Clearinghouse Rules states that in performing its activities it prioritizes the security, efficiency, integrity and stability of the financial system.

With regard to BM&FBOVESPA's central depository activities, article 2 of BM&FBOVESPA Central Depository rules states that in performing its activities it adopts mechanisms designed to assure the existence and integrity of the securities deposited with it, effecting their safekeeping, position control and reconciliation in accordance with the applicable rules and laws, and with its own operating procedures.

With regard to BM&FBOVESPA's Foreign Exchange Clearinghouse, the main objectives are defined in article 2 of its rulebook, which states that only foreign-exchange transactions registered in the clearinghouse's systems, and analysed, accepted, and contracted for by the clearinghouse, are cleared and settled by it and that all this is performed according to the foreign-exchange regulations in force.

BM&FBOVESPA establishes and internally disseminates strategic guidelines for the conduct of its business and for prioritising projects to achieve its objectives. These guidelines are designed to promote enhancements to its operating efficiency, to create better risk management models, and to strengthen the security and solidity of the markets it manages. The Board of Directors and Executive Board discuss and review the strategic guidelines annually. As the body responsible for setting priorities, BM&FBOVESPA's Executive Board ensures that security and efficiency enhancements are among the key guidelines promoting appropriate treatment and prioritisation of efforts.

Furthermore, strategic projects geared to implementing the strategic guidelines are developed and disclosed to the market by publication on BM&FBOVESPA's investor relations website.

As a public company, BM&FBOVESPA publishes quarterly reports and financial statements in compliance with Brazilian law. These include information about its performance in meeting its objectives and the status of its strategic projects. BM&FBOVESPA's Board of Directors holds at least eight ordinary meetings a year to discuss the company's strategic performance and evaluate its achievements, in accordance with the requirements of its Bylaws and the Internal Regulation of the Board of Directors. Its corporate governance guidelines are established and followed in the same way as the requirements for the listing of public companies in the listing segment named Novo Mercado.

The objectives identified in BM&FBOVESPA's Bylaws and the normative documents of BM&FBOVESPA's clearinghouses and BM&FBOVESPA Central Depository reflect objectives that support financial stability. The following departments and committees of BM&FBOVESPA are directly involved in efforts to obtain the financial stability expressed in the company's objectives:

1. Risk Management Department

2. Internal Controls, Compliance and Corporate Risk Department
3. Auditing Department
4. Audit Committee (advisory committee to the Board of Directors)
5. Market Risk Technical Committee (advisory committee to the Executive Board)
6. Credit Risk Technical Committee (advisory committee to the Executive Board)
7. Financial Department
8. Risk and Financial Committee
9. External auditors

The Board of Directors and Executive Board maintain constant contact with regulators and government authorities to identify public-interest issues that may contribute to the stability and development of the capital markets. For the same reason, identifying and pursuing objectives that reflect public interests are part of BM&FBOVESPA's objectives.

The objectives identified in BM&FBOVESPA's Bylaws explicitly reflect other relevant public-interest considerations, such as the development of educational activities.

Key Consideration 2 - *An FMI should have documented governance arrangements that provide clear and direct lines of responsibility and accountability. These arrangements should be disclosed to owners, relevant authorities, participants, and, at a more general level, the public.*

The corporate governance model adopted by BM&FBOVESPA is described below, as established in its Bylaws and delineated by its corporate governance guidelines. All corporate governance documents are disclosed to its shareholders, to relevant authorities, to participants, and to the general public, and available for download from its investor relations portal (ri.bmfbovespa.com.br).

BM&FBOVESPA is a public company and trades under the ticker symbol BVMF3 on the Novo Mercado premium listing segment for companies committed to the highest standards of corporate governance. Shareholders participate directly in certain BM&FBOVESPA decisions and in approving the financial statements. General shareholder meetings are held at least once a year.

BM&FBOVESPA publishes its quarterly and annual results, and complies with all the norms and obligations of a legal and regulatory nature relating to accountability.

The documents *Disclosures and Securities Trading Policy Manual* and *Policy on Related Party Transactions and other Conflict of Interest Situations* govern the use and disclosure of information relating to BM&FBOVESPA, its subsidiaries and affiliates, the confidentiality of insider information and the policy for trading in securities issued by BM&FBOVESPA.

All stock issued by BM&FBOVESPA consists of common shares giving the holder the right to vote at general shareholder meetings. However, no single shareholder or organised shareholder group may exercise voting rights equivalent to more than 7% of the total number of shares outstanding. This voting limit is designed to preserve dispersed ownership. Moreover, in accordance with the rules and regulations issued by CVM and with BM&FBOVESPA's Bylaws, any investor who wishes to acquire equity or partner's rights, including usufruct, that afford voting rights on a quantity of shares corresponding to 15% or more of the total shares outstanding must first obtain permission from CVM.

The Board of Directors is the principal collegiate decision-making body in BM&FBOVESPA's management structure. It establishes guidelines for BM&FBOVESPA's actions in pursuit of its strategic objectives, approves the organisation's key plans and targets, establishes specific guidelines to be internally implemented, and oversees the business performance of the organisation and of its executives.

The Board of Directors has at least 7 and at most 11 members who are highly experienced in their respective knowledge areas. A majority are independent members and the others are shareholder representatives. However, in order to assure approval of the merger with CETIP by all competent regulators, the maximum number of board members has been raised to 14 for up to two years as of the start of these members' terms. BM&FBOVESPA's Bylaws define as independent board members those who (a) comply with both the independence criteria established by the Novo Mercado Listing Rules (the listing segment with the highest standards of corporate governance) and those of CVM Instruction 461/07; and (b) neither directly nor indirectly hold voting rights equivalent to 7% or more of BM&FBOVESPA's total equity or total voting stock nor have links to shareholders with such voting rights.

The following advisory committees are subordinated to the Board of Directors, with the key function of ensuring that BM&FBOVESPA's business activities are conducted so as to protect and increase the value of its equity while preserving the security, efficiency, integrity and stability of the financial system. Specifically, the committees examine and evaluate processes and policies in their respective spheres and knowledge areas, formulating recommendations that may or may not be taken up by the Board. Committee members serve a two-year term and can be re-elected.

- Audit Committee: must comprise up to six members, all independent, of whom at least one and at most two must be independent members of the Board of Directors, and at least three and at most four must be external independent committee members. At least one of the committee members must have recognized experience in corporate accounting. Among other functions, this committee is responsible for supervising the activities of independent auditors and of BM&FBOVESPA's own internal auditing, internal control and corporate risk management activities. It continuously monitors and reviews the internal control and risk management mechanisms.
- Corporate Governance and Nomination Committee: must comprise three members, at least two of whom must be independent members of the Board of Directors. This committee's remit includes responsibility for developing and evaluating the adoption of best practice in corporate governance; selecting candidates and nominating members to the Board of Directors;

supporting the Board of Directors in the process of selecting and nominating the CEO; and supporting the CEO in the process of selecting and nominating the other C-level executives.

- Compensation Committee: must comprise three members, at least two of whom must be independent members of the Board of Directors. This committee is responsible among other things for proposing, reviewing and monitoring parameters and guidelines for compensation and benefit policy and the personnel management model, and for proposing adjustments and modifications to them.
- Risk and Financial Committee: must comprise at least four members of the Board of Directors, regardless of whether they are independent. This committee's remit includes monitoring the risks inherent in BM&FBOVESPA's activities and evaluating those risks from a strategic and structural standpoint, evaluating and suggesting risk management strategies and guidelines, and periodically reviewing the adequacy of BM&FBOVESPA's risk management.
- Securities Intermediation Industry Committee: up to nine members, consisting of at least one and at most two board members, one of whom chairs the committee, plus seven external members. This committee is responsible among other things for evaluating issues affecting the institutions that participate as intermediaries in the markets managed by BM&FBOVESPA, and for making recommendations to the Board of Directors on ways of strengthening the investment intermediation industry.
- Integration Committee: with three board members, this committee's remit includes overseeing the evolution of the main themes relating to integration between the BM&FBOVESPA and CETIP, tracking achieved synergies against expected synergies, and discussing any items submitted to the committee by the Board of Directors.
- Product & Pricing Committee: with two board members and seven external members, this committee is responsible among other things for overseeing investment and product development plans in the markets managed by BM&FBOVESPA, monitoring implementation of BM&FBOVESPA's commercial discount policies, and evaluating BM&FBOVESPA's pricing structure, which includes comparing its prices with those charged by leading exchanges.
- Issuer Regulation Committee: with three board members, none of whom may be an executive of another public company, this committee's remit includes overseeing the activities of BM&FBOVESPA's Issuer Regulation Department.
- IT Committee: with eight members, two of whom are board members and the rest external to the Company, this committee is responsible among other things for monitoring and analysing new technologies that represent opportunities and their potential impact on the Company's business.

BM&FBOVESPA is administered and managed by an Executive Board appointed by the Board of Directors in accordance with the Bylaws. The Executive Board has at least five and at most nine members including the Chief Executive Officer (CEO) and up to eight other chief executive officers. Its current members are the CEO, Chief Financial Officer, Chief Operating Officer, Chief Financial Unit Officer, Chief Technology and Information Security Officer, and Chief Product and Client Officer.

The Executive Board is responsible for general and routine administration of BM&FBOVESPA’s business activities. Its remit is to assure BM&FBOVESPA’s regular functioning and compliance with the Bylaws and the decisions of the Board of Directors and general meetings of shareholders, and to coordinate the activities of the companies controlled by BM&FBOVESPA. It is also responsible for submitting to the Board of Directors proposals on matters relevant to BM&FBOVESPA’s business, as required by the Bylaws. The Executive Board meets once a week and decides by a majority of those attending. The CEO has the casting vote. Consensus decisions are preferred. Thus the Executive Board focuses on constructive discussion, team spirit, and collegiate decision making. In sum, based on the powers conferred by law and BM&FBOVESPA’s Bylaws, the Executive Board performs the following duties:

- Proposing initiatives, policies, and annual and multiannual budgets to the Board of Directors;
- Implementing the strategy established by the Board of Directors;
- Directing BM&FBOVESPA’s business activities and managing its routine operations;
- Assuring compliance with its own legal and regulatory obligations and with those of BM&FBOVESPA as an operator of exchanges and regulated capital markets.

Pursuant to the provisions of BM&FBOVESPA’s Bylaws, the members of the Board of Directors are not eligible to be executive officers of BM&FBOVESPA or its subsidiaries. The Chairman of the Board is therefore not allowed to be an executive of BM&FBOVESPA.

BM&FBOVESPA has 31 non-statutory executive officers, who report to the Executive Board.

BM&FBOVESPA’s corporate governance model also includes BSM’s Supervisory Board whose remit is to supervise the markets and their participants, apply penalties, consider appeals against decisions of the Chief Regulatory Officer or BM&FBOVESPA, and decide on claims on the Investor Compensation Mechanism (MRP). The members of BSM’s Supervisory Board are appointed by approval of BM&FBOVESPA’s Board of Directors.

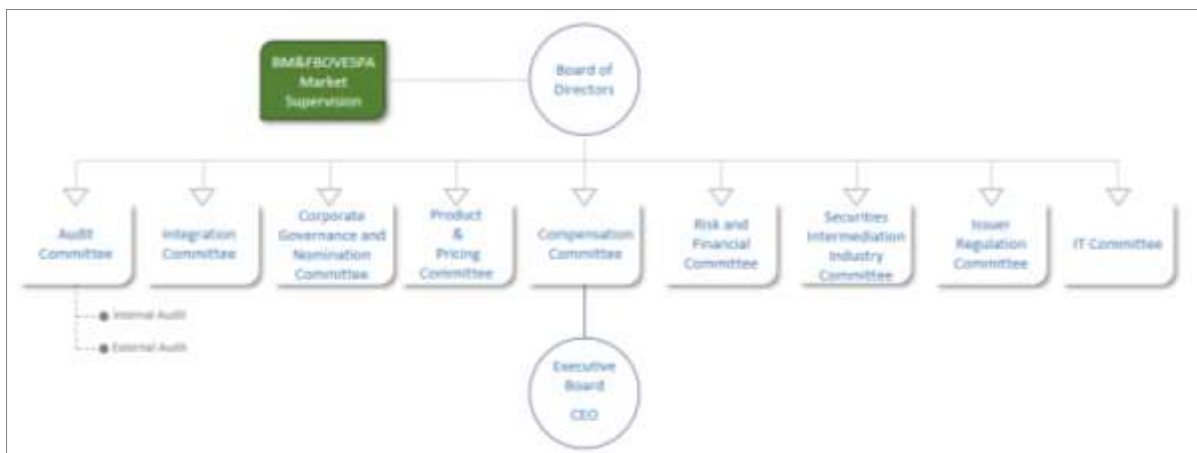


Figure 1. BM&FBOVESPA’s corporate governance structure

Besides the advisory committees to the Board of Directors, other committees have been set up to reinforce BM&FBOVESPA's corporate governance in its management strategy. These serve one-year terms and report directly to the Executive Board:

- Corporate Risk Advisory Committee: comprising nine executive officers, this committee's main remit consists of evaluating, discussing and continuously monitoring the operational, strategic, financial and regulatory risks that make up BM&FBOVESPA's corporate risk profile.
- Credit Risk Technical Committee: comprising seven executive officers, this committee is responsible for approving risk limits assigned to participants in BM&FBOVESPA's clearinghouses; monitoring and periodically evaluating counterparty risk represented by clearinghouse participants, custody agents and investors; establishing criteria and parameters for requiring additional collateral; and analysing any other matters and proposing any other measures it deems necessary in connection with the aforementioned issues.
- Market Risk Technical Committee: comprising seven executive officers, this committee is responsible for defining the criteria and parameters to be used in calculating margin requirements and the value of collateral; proposing the collateral management policy; evaluating the macroeconomic outlook in terms of risks for the markets managed by BM&FBOVESPA; analysing the level of leverage in the system; analysing and proposing suggestions for the enhancement of the risk systems; and analysing any other matters and proposing any other measures it deems necessary in connection with the aforementioned issues.
- Indices Committee: comprising the CEO and eleven executive officers, this committee's remit consists of evaluating and approving opportunities to introduce enhancements to the methodologies and procedures used for BM&FBOVESPA's indices.
- Operational Qualification Program (PQO) Certification Committee: comprising the CEO and twelve executive officers, this committee is responsible mainly for evaluating applications to use qualification seals, and proposing changes to the rules and procedures of the Operational Qualification Program.
- Sustainability Committee: comprising the CEO, ten executive officers and two external participants, this committee's remit includes strategic guidance, approval of planning, and approving sponsorship of sustainability-related projects.
- Code of Conduct Committee: comprising seven executive officers, this committee is responsible among other things for assuring compliance with the Code of Conduct and managing its enforcement.
- Anti-Money Laundering Committee: comprising nine executive officers, this committee's remit includes approving norms, procedures and measures relating to the anti money laundering program; evaluating the effectiveness of BM&FBOVESPA's AML processes and controls; evaluating suspicious and/or atypical transactions detected by surveillance processes; and deciding whether to notify the relevant authorities.

- Information Security Management Committee: comprising seven executive officers, this committee is responsible mainly for evaluating the effectiveness and sufficiency of information security management's activities; analysing infringements of the information security policy and rules; and monitoring the progress made by projects and initiatives relating to information security.
- Business Continuity Committee: comprising ten executive officers, this committee's remit includes evaluating the effectiveness and sufficiency of business continuity management's activities; monitoring and evaluating the results of business continuity tests; and validating and proposing recovery goals resulting from business impact analysis.
- Projects, Products & Services Committee: comprising nine executive officers, this committee is responsible among other things for approving and setting priorities for the Company's projects. It may prioritize efforts among the initiatives being studied or executed, approve project development and intermediate delivery timetables, if any, verifying allocation of the people responsible and resources required for execution, monitor capabilities and budgets available for new project execution, and assess the impact of each new project's approval on the portfolio of projects in progress.

In addition to the aforementioned advisory committees to the Board of Directors and Executive Board, BM&FBOVESPA has 13 advisory committees designed to assure continuous interaction with market participants in specific areas of the capital markets (for a list of these advisory committees, see under Key Consideration 7).

Duties, powers and responsibilities

BM&FBOVESPA's Bylaws formally define the duties, powers and responsibilities of the members of its Board of Directors (articles 29-30) and Executive Board (Chapter IV, Section III).

The duties and powers of the Board of Directors are listed under Key Consideration 3. The Board of Directors may delegate to the Executive Board powers to define technical, financial and operational criteria as supplementary requirements to the norms and regulations addressed by certain items in articles 29 and 30 of BM&FBOVESPA's Bylaws.

Self-regulation

As noted under Principle 1, to perform its self-regulatory function BM&FBOVESPA has organised a special-purpose vehicle, BSM, which is responsible for self-regulation activities. The operational departments of BM&FBOVESPA provide information to BSM regularly, and whenever necessary under specific circumstances.

Accountability to market participants

Formally speaking, BM&FBOVESPA discloses decisions and material information regarding its trading and post-trading activities in notices called Circular Letters and External Communications.

BM&FBOVESPA has a department responsible for relations with market participants (Relations with Participants and Market Data Department, which reports to the Chief Operating Officer) and for ensuring that they receive required or requested information.

Accountability to regulators

BM&FBOVESPA is legally obliged to provide the regulators with information on trading and post-trading at regular intervals. The Executive Board responds promptly to requests for information and questions formally received from regulators.

Key Consideration 3 - *The roles and responsibilities of an FMI's board of directors (or equivalent) should be clearly specified, and there should be documented procedures for its functioning, including procedures to identify, address, and manage member conflicts of interest. The board should review both its overall performance and the performance of its individual board members regularly.*

Roles and responsibilities of the Board of Directors

The roles and responsibilities of BM&FBOVESPA's Board of Directors are clearly identified and listed in articles 29 and 30 of the Bylaws, including the guidelines to be followed by BM&FBOVESPA in conducting its business and pursuing its strategic objectives.

The procedures, roles, responsibilities and composition of the Board of Directors are comprehensively described in the Internal Regulation of the Board of Directors and internal regulation of each of the Advisory Committees to the Board of Directors. All these documents are available from BM&FBOVESPA's investor relations portal (<http://ri.bmfbovespa.com.br>, Corporate Governance / Bylaws, Codes and Policies).

The Board of Directors may delegate to the Executive Board powers to define technical, financial and operational criteria as supplementary requirements to the norms and regulations addressed by some of the above items.

The Board of Directors also approves the organisation's key plans and targets, establishes specific guidelines to be internally implemented, and oversees the business performance of the organisation and of its executives.

With regard to conflicts of interest, the document *Policy on Related Party Transactions and other Conflict of Interest Situations* establishes rules to ensure that all decisions, especially those involving related parties and other potential conflicts of interest, are aligned with the interests of BM&FBOVESPA and its shareholders. This policy applies to all members of the Board of Directors, executive officers and other staff of BM&FBOVESPA and its subsidiaries, and is available from BM&FBOVESPA's investor relations portal (ri.bmfbovespa.com.br, Corporate Governance, Bylaws, Codes and Policies).

If they suspect a potential conflict of interest, persons with significant influence in the administration of BM&FBOVESPA must promptly disclose it. They are also required to abstain from taking part in

discussions or voting on such matters. They may contribute partially to discussions if asked to do so by the Chair of the Board of Directors or the CEO, with the aim of providing further information on the transaction concerned and the parties involved. In this case they must recuse themselves from the concluding part of the discussion and from voting on the issue that has given rise to a conflict of interest.

If any person with significant influence in the administration of BM&FBOVESPA remains silent about a potential conflict of interest, any other member of the same governance body who is aware of the situation may disclose it. Such silence is considered an infringement of BM&FBOVESPA's Policy on Related Party Transactions and other Conflict of Interest Situations and is brought to the notice of the Executive Board, which may recommend corrective action to the Board of Directors.

All notices of potential conflicts of interest and abstentions from voting must be recorded in the minutes from the respective meetings of the Board of Directors or Executive Board, as appropriate.

On taking office, directors and executive officers of BM&FBOVESPA are required to sign a document attesting to their awareness of the Policy on Related Party Transactions and other Conflict of Interest Situations, and undertaking to comply.

Each year the Chair, with the support of the Corporate Governance and Nomination Committee, conducts a structured formal assessment of the Board of Directors as a whole, and of its individual members, with the aim of enhancing efficiency and corporate governance. This process entails a self-assessment by board members in response to specific questions covering the five main dimensions of effective corporate governance:

- Strategic focus;
- Knowledge and information about the company's business activities;
- The board's independence and decision-making process;
- Efficiency and effectiveness of board meetings and advisory committees; and
- Motivation and alignment of interests.

The results of these assessments are compiled and discussed at a board meeting, which then evaluates proposals and plans for improvement.

Key Consideration 4 - *The board should contain suitable members with the appropriate skills and incentives to fulfil its multiple roles. This typically requires the inclusion of non-executive board member(s).*

BM&FBOVESPA's Bylaws state that all members of the Board of Directors must be at least 25 years old, have an unblemished reputation, and be familiar with the functions, activities and practices inherent in the capital markets, especially the markets managed by BM&FBOVESPA and/or its subsidiaries. The Bylaws and the Internal Regulation of the Board of Directors contain a detailed

description of the eligibility requirements applicable to independent board members. They also require board members to be elected by slate, and only slates that nominate candidates may run. These must include the slate presented by the board itself. In preparing its slate, the board is assisted by the Corporate Governance and Nomination Committee. Any shareholder or shareholder group (as defined in the Bylaws) may also present a slate.

Suitable compensation incentivises board members to demonstrate a high degree of commitment and contribute effectively to achievement of BM&FBOVESPA's long-term objectives.

Board members receive a fixed monthly honorarium to compensate them for attending meetings and participating in BM&FBOVESPA's business activities. The Chair receives additional remuneration in the form of a semiannual bonus equivalent to twice the remuneration received in each six-month period. The bonus remunerates the Chair for the additional duties the position requires.

Members of the board's advisory committees receive fixed monthly remuneration. Board members who also sit on committees receive additional fixed monthly remuneration. No board member may sit on more than three committees.

BM&FBOVESPA has a stock grant plan whereby all board members are eligible for grants of shares in BM&FBOVESPA's common (voting) stock after the requisite waiting period and in accordance with other terms and conditions established in the plan.

As mentioned above, the Board of Directors must comprise a majority of independent members as defined in the Bylaws (for the full definition, see under Key Consideration 2), the Novo Mercado Listing Rules and CVM Instruction 461/07.

BM&FBOVESPA publishes the names of all board members qualified as independent. The board currently has 14 members, of whom ten are independent. For more details, please visit ri.bmfbovespa.com.br.

Key Consideration 5 - *The roles and responsibilities of management should be clearly specified. An FMI's management should have the appropriate experience, a mix of skills, and the integrity necessary to discharge their responsibilities for the operation and risk management of the FMI.*

The Executive Board is BM&FBOVESPA's representative body and empowered to perform all acts required for management of the business. At this time the Executive Board comprises six executive officers including the CEO. Its roles and responsibilities are specified in Chapter IV, Section III of the Bylaws. Any changes must be approved by the Board of Directors.

Executive officers are responsible for complying with and enforcing compliance with the Bylaws, the decisions of the Board of Directors and general shareholder meetings; performing within their remit all acts necessary to the regular functioning of BM&FBOVESPA and achievement of its corporate purposes; and coordinating the activities of BM&FBOVESPA's subsidiaries.

The internal rules of the Executive Board, approved by the Board of Directors, define its roles, which include proposing initiatives, business plans and policies, implementing the strategy defined by the

Board of Directors, and managing BM&FBOVESPA's day-to-day activities in accordance with the guidelines set out in its scope of authority.

The members of the Executive Board are subject to specific internal rules contained in the Disclosures and Securities Trading Policy Manual, the Code of Conduct, the Information Security Policy and the Policy on Related Party Transactions and other Conflict of Interest Situations.

The Executive Board's performance is assessed by means of an assessment of the CEO and chief officers. All such assessments are carried out at the start of each year, when targets are also set for the following year on the basis of BM&FBOVESPA's strategic plans.

Responsibilities of the CEO and chief officers

The CEO is responsible for day-to-day management of BM&FBOVESPA, chairing the Executive Board, and acting as the link between the latter and the Board of Directors. The CEO reports to the Board of Directors and must execute the guidelines set by it. The CEO has a duty of loyalty to BM&FBOVESPA.

Each chief officer is personally liable for his or her contribution to BM&FBOVESPA's management and accountable for this to the CEO, as well as the Board of Directors, shareholders and other parties involved, whenever so required and with the consent of the CEO.

As the leader of BM&FBOVESPA's chief officers, the CEO is responsible for approval and implementation of all operational and financial processes. The CEO must also implement and control all legal and regulatory obligations applicable to BM&FBOVESPA as an operator of regulated securities markets.

The CEO's roles and powers are listed in article 35 of BM&FBOVESPA's Bylaws. The roles and powers of the other chief officers are described in item 12.1 (d) of BM&FBOVESPA's Reference Form.

The process and criteria for selecting executive officers are detailed in the internal rules of the Executive Board. Candidates for membership of the Executive Board must comply with the following requirements in addition to those established in the applicable legislation and regulation:

- They must be more than 25 years old;
- They must have an unblemished reputation, and be familiar with the markets managed by BM&FBOVESPA and/or its subsidiaries;
- They must not have spouses, life partners or first- or second-degree relatives in management positions at BM&FBOVESPA or its subsidiaries, or otherwise or employed by them;
- They must not hold a position in a company that can be considered a competitor of the Company, its affiliates or subsidiaries;
- They must not have interests or represent anyone who has interests that conflict with those of BM&FBOVESPA and its subsidiaries, as required by BM&FBOVESPA's Policy on Related Party Transactions and other Conflict of Interest Situations.

To ensure that candidates have the necessary skills to manage operations and risks in the context of BM&FBOVESPA's clearinghouse, CSD and TR activities, they are interviewed by the Board of

Directors, and by the CEO and other chief officers. They must also present documents evidencing their qualifications for the position.

Key Consideration 6 - *The board should establish a clear, documented risk-management framework that includes the FMI's risk-tolerance policy, assigns responsibilities and accountability for risk decisions, and addresses decision making in crises and emergencies. Governance arrangements should ensure that the risk-management and internal control functions have sufficient authority, independence, resources, and access to the board.*

BM&FBOVESPA's Board of Directors has established two risk management frameworks: a framework for managing central counterparty risk; and a framework for managing corporate risk.

Central counterparty risk management framework

The central counterparty risk management framework covers risk tolerance policy and establishes responsibilities and reporting lines for decisions on risk through the following bodies:

- (i) Board of Directors: oversees enforcement of the risk management policies and assessment of their results;
- (ii) Risk and Financial Committee (advises the Board of Directors): establishes high-level risk management guidelines for the entire company and for the central counterparty function;
- (iii) Executive Board: defines high-level risk management policies and takes decisions in crisis and emergencies, with the support of the Market Risk and Credit Risk Technical Committees;
- (iv) Market Risk Technical Committee (see under Key Consideration 2);
- (v) Credit Risk Technical Committee (see under Key Consideration 2);
- (vi) Risk Analysis Advisory Committee:
 - Analysis of BM&FBOVESPA's risk methodologies
 - Discussion of best practice in risk management
 - Monthly review of stress scenarios;
- (vii) Risk Management Department (reporting to Chief Operating Officer, with seven Associate Directors – Statistical Modelling, Systemic Risk Management, Pricing, Central Counterparty Risk, Credit Risks, Collateral Management and Modelling): implementation and control of guidelines and policies in accordance with the strategy defined; development of risk management models based on stress testing; intraday monitoring of market, liquidity and credit risks based on the aforementioned models; control of risk exposure limits at the level of the individual customer.

BM&FBOVESPA Clearinghouse and the Foreign Exchange Clearinghouse are subject to supervision by BCB, which:

- authorises risk methodologies and risk management parameters and procedures, including norms and procedures for use in the event of participant default, as published and posted on BM&FBOVESPA's website;
- analyses margin methodology backtesting reports;
- performs annual audits.

With regard to the risk management models and methodologies used, the Risk and Financial Committee analyses proposed risk management models approved by the Market Risk Technical Committee.

Internal Controls, Compliance and Corporate Risk Department also validates the methodologies used to manage central counterparty risk and reports on the results of such validations to the Managing Director of the Risk Management Department and to BCB.

The process for determining, endorsing and reviewing the risk management framework also applies when new products to be cleared and settled by BM&FBOVESPA's clearinghouses are introduced, and when risk management methods are modified or improved:

- New products: Product Development submits new products to Risk Management Department, which specifies the risk model for approval by the Market Risk Technical Committee. Once approved, the new specification is implemented;
- Risk management methodology modifications and enhancements: proposed modifications/enhancements are submitted to the Market Risk Technical Committee and/or the Credit Risk Technical Committee, as appropriate, and to the Risk Analysis Advisory Committee. If approved, they are then presented to the Executive Board and submitted to BCB for approval.

See under Principles 3-7 for more information on the central counterparty risk management framework.

Corporate risk management framework

BM&FBOVESPA's corporate risk management framework is designed to assure the identification, measurement, control and mitigation of material risks inherent in BM&FBOVESPA's activities. It is based on the Corporate Risk Management Policy, Operational Risk Policy and Internal Controls Policy (ri.bmfbovespa.com.br), and on risk management processes such as the recording of risks identified, controls, and risk assessment and treatment.

Corporate risk management is the responsibility of the Internal Controls, Compliance and Corporate Risk Department, which reports to the CEO and has four Associate Directors (Corporate Processes and Risks, Financial and Modelling Risks, Internal Controls and Compliance, and Business Continuity).

The Corporate Risk Advisory Committee, which advises the Executive Board, is responsible for appraising and continuously monitoring the operational, strategic, financial, regulatory, reputational, image and socio-environmental risks that make up BM&FBOVESPA's risk profile.

BM&FBOVESPA's corporate and operational risk policies and internal control policy are reviewed every year for approval by the Executive Board and Board of Directors.

The methodology for the corporate risk management framework is based on ISO 31000:2009. To evaluate internal controls, BM&FBOVESPA's Internal Controls, Compliance and Corporate Risk Department also uses the COSO-ERM Framework, recommended by the Committee of Sponsoring Organizations of the Treadway Commission (COSO), and the COBIT Framework (Control Objectives for Information and Related Technologies).

The corporate risk management framework establishes the principles, guidelines – including tolerance of the various risks faced by BM&FBOVESPA – and responsibilities to be observed in the risk management process so as to enable the identification, assessment, treatment, monitoring and communication of risks. To treat risks identified within the sphere of a given department's activities, the officer responsible must decide how to respond. The options available are acceptance, elimination, reduction or transfer.

Acceptance of residual risks is assessed by different levels of signoff authority depending on their gravity. For example, risks classified as high and extreme must be approved by the Board of Directors, in line with the level of risk appetite established by BM&FBOVESPA.

If the decision is to eliminate, reduce or transfer risk, the officer responsible for the department concerned must develop action plans to mitigate the risk, working with the Internal Controls, Compliance and Corporate Risk Department, and these plans must be approved by the Executive Board.

The Auditing Department is responsible for conducting internal audits activities at BM&FBOVESPA. It has its own regiment - Audit Committee Internal Regiment -, which is approved by the Board of Directors and periodically reviewed by the Audit Committee. The regiment specify the appropriate levels of access and authority for the performance of its activities.

The Auditing Department has two divisions (Process Auditing and Technology Auditing), each headed by an Associate Director who reports directly to the Auditing Managing Director.

In order to ensure the independence of internal auditing, the Managing Director who heads the department reports to the Board of Directors and to the Audit Committee, which is responsible for evaluating and supervising the internal auditing activities.

Key Consideration 7 - *The board should ensure that the FMI's design, rules, overall strategy, and major decisions reflect appropriately the legitimate interests of its direct and indirect participants and other relevant stakeholders. Major decisions should be clearly disclosed to relevant stakeholders and, where there is a broad market impact, the public.*

BM&FBOVESPA's decision-making process takes the interests of stakeholders into account through the advisory committees, specific meetings for all participants, and public consultations. These mechanisms ensure that BM&FBOVESPA is capable of receiving the views of participants about proposed new policies or amendments to existing policies, and can examine these views to decide whether any not already covered should be included in the new policies or amendments. In the case

of existing policies, participants may ask for or propose a justified change at any time via the advisory committees or channels of communication with members of the Board of Directors.

BM&FBOVESPA's advisory committees comprising representatives of intermediaries, investors and issuers, among others, are as follows:

1. Soybean and Corn Advisory Committee
2. Coffee Advisory Committee
3. Live Cattle Advisory Committee
4. Sugar and Ethanol Advisory Committee
5. Equities Advisory Committee
6. Real Estate Market Advisory Committee
7. Risk Analysis Advisory Committee
8. Trading Advisory Committee
9. Post-Trade Advisory Committee
10. Listing Advisory Committee
11. Fixed Income, Foreign Exchange and Derivatives Advisory Committee
12. Market Supervision and Norms Advisory Committee
13. State-Owned Enterprise Governance Market Advisory Committee

BM&FBOVESPA has an Ombudsman to help capture market needs.

New risk management policies and amendments to existing risk management policies must be approved by BCB and/or CVM, so that their interests as stakeholders are also taken into consideration.

Market participants (clearing members, brokerage houses, custody agents, investors etc.) can contact BM&FBOVESPA's management at any time. Their requirements are evaluated by the appropriate governance bodies.

With regard to conflicts of interest, the Policy on Related Party Transactions and other Conflict of Interest Situations establishes rules to ensure that all decisions are aligned with the interests of BM&FBOVESPA and its shareholders.

BM&FBOVESPA discloses the main decisions taken by the Board of Directors by publishing the minutes from board meetings on its investor relations website (ri.bmfbovespa.com.br).

PRINCIPLE 3 – FRAMEWORK FOR THE COMPREHENSIVE MANAGEMENT OF RISKS

PRINCIPLE 3 – FRAMEWORK FOR THE COMPREHENSIVE MANAGEMENT OF RISKS: An FMI should have a sound risk-management framework for comprehensively managing legal, credit, liquidity, operational, and other risks.

Key Consideration 1 - An FMI should have risk management policies, procedures, and systems that enable it to identify, measure, monitor, and manage the range of risks that arise in or are borne by the FMI. Risk-management frameworks should be subject to periodic review.

BM&FBOVESPA is exposed to strategic risks (such as the possibility of implementing a strategy that fails to achieve the expected goals), financial risks (including credit, market and liquidity risks), operational risks, and regulatory risks.

As noted under Principle 2, Key Consideration 6, BM&FBOVESPA has a framework for the management of central counterparty risk and a framework for the management of corporate risks.

The Board of Directors is responsible for defining risk appetite and establishing high-level guidelines for risk management activities. In this respect the board is supported by the assessments and recommendations of the Risk and Financial Committee, Audit Committee and Executive Board.

Corporate risks

BM&FBOVESPA's framework for the management of corporate risks is designed to assure the identification, measurement, control and mitigation of material risks inherent in BM&FBOVESPA's activities. It is based on the Corporate Risk Management Policy, Operational Risk Policy and Internal Controls Policy, and on risk management processes such as the recording of risks identified, controls, and risk assessment and treatment (supported by the BWISEGRC system). All these policies are reviewed annually and submitted for approval to the Executive Board and Board of Directors.

The governance of BM&FBOVESPA's risk management and internal controls is structured in terms of lines of defence, as described below:

1st line of defence - The Executive Board is responsible for sponsoring the implementation of efficient business practices and adequate and effective internal controls; to this end it must allocate the resources required by the process and define the appropriate infrastructure for management of business risks and the internal control system. Management is responsible for establishing, maintaining, promoting and evaluating efficient business practices and adequate and effective internal controls.

2nd line of defence – The Internal Controls, Compliance and Corporate Risk Department is responsible for defining the methods to be used to evaluate and monitor business risks, the internal control system and adherence to the processes implemented by Internal Controls and

Compliance, as well as for verifying compliance with the norms issued by the regulators, especially CVM and BCB.

3rd line of defence – The Auditing Department is responsible for independent evaluation of the activities of BM&FBOVESPA’s departments, enabling management to verify the adequacy of controls, the effectiveness of risk management and governance processes, the adequacy of the controls that support the issuance of financial statements, and compliance with norms and regulations.

4th line of defence - Independent outside auditors, who review the financial statements to ensure they do not contain material distortions and are drawn up in accordance with an adequate framework; and the regulators, especially BCB and CVM, which evaluate whether BM&FBOVESPA has an adequate infrastructure for the performance of its systemic activities and compliance with the applicable norms.



Figure 2. BM&FBOVESPA’s lines of defence

The corporate governance framework is reinforced by the actions of the Audit Committee, which supervises the activities of Internal Controls; monitors the quality and integrity of the internal control mechanisms; and evaluates the effectiveness and sufficiency of the internal control system (including legal, tax and labor law risks).

Central counterparty risk

The main risks associated with BM&FBOVESPA’s clearinghouse and CCP activities are credit, market and liquidity risks.

BM&FBOVESPA’s Board of Directors has defined low appetite for CCP risks, establishing that the safeguard structure must be capable of protecting BM&FBOVESPA against events whose severity is defined by a high confidence level (e.g. against a scenario in which two participants default simultaneously with a 99.97% market risk confidence level).

The CCP risk management policies and procedures are described in BM&FBOVESPA’s clearinghouse rulebooks, operating procedures manuals and risk management manuals. Any changes in risk

management that require amendments to the clearinghouse rules must be submitted to the Board of Directors for approval. Changes to risk management procedures, criteria and systems must be approved by the Market Risk Technical Committee and/or the Credit Risk Technical Committee. Changes to clearinghouse rules and manuals also require prior approval by BCB.

BM&FBOVESPA's clearinghouses have safeguard structures to cover credit and liquidity risks, as well as their own risk management systems.

Each clearinghouse's safeguard structure consists of the collateral posted by participants and two components that consists of BM&FBOVESPA's own funds, which are BM&FBOVESPA's contribution to the settlement fund and additional cash earmarked to the clearinghouse. The amount of collateral required from participants is calculated on the basis of the risk associated with transactions: for both end-of-day margin requirements and intraday monitoring, risk is calculated according to the stress test methodology with a risk horizon of up to ten days, full valuation, and heavy-tailed distribution.

The risk management systems used by the clearinghouses are described below.

BM&FBOVESPA Clearinghouse

- *CORE – CloseOut Risk Evaluation*: the risk calculation or margining system used both to calculate margin requirement for each customer at the end of the day (T+0) and the corresponding margin calls for T+1, and to monitor intraday risk. CORE is a stress test methodology to estimate the worst cash flow accumulated during the process of closing out a defaulter's portfolio, considering a closeout horizon of up to ten days, full valuation, and a confidence level of at least 99.96% (heavy-tailed distributions) for all contracts considered systemically relevant. The risk calculated by CORE captures market, liquidity and cash flow risks (for more information, see under Principle 6, Key Consideration 3).
- *Intraday risk system*: intraday risk monitoring system for each intermediary (full trading participants and settlement participants), using the CORE methodology to update approximately every 20 minutes throughout the day both risk for all portfolios at the customer level and risk for unallocated trades, aggregating trades and the movement of collateral performed up to the moment of calculation (for more information, see under Principle 4, Key Consideration 4).
- *Risk simulator*: margining for hypothetical portfolios based on the CORE methodology, offered to intermediaries and clearing members to assist them in their risk management activities, especially intraday risk monitoring.
- *Open interest concentration limits*: a system that controls and monitors compliance by each customer's positions with the concentration limits set by the clearinghouse. Positions are consolidated taking into consideration the customer's activities with all intermediaries and clearing members. Violations of position limits result in an additional margin call (concentration add-on), and/or compulsory position closeout. Concentration add-ons cover potential losses during the additional period (over and above the period considered for margining) potentially required to close out the position that exceeds the limit.

- *Collateral management*: a system that controls and processes all movements of collateral, segregating them at the customer level (in the case of collateral posted by investors for margin coverage), or at the level of the intermediary or clearing member (in the case of the collateral posted to cover intraday risk or to contribute to the settlement fund). The functioning of the system follows the rules, limit criteria and procedures for transfers and custody of the assets deposited.
- *Collateral issuance limits*: a system to control the issuer credit risk inherent in collateral consisting of CDs, letters of credit issued by banks, real estate letters of credit (LCIs) and agribusiness letters of credit (LCAs). The system manages the rules for issuer concentration at the level of the customer, intermediary and clearing member.
- *Backtesting*: a system for backtesting the margin model (CORE), run every day to evaluate margin requirement for each customer's portfolio.
- *Liquidity testing*: a system that analyses the sufficiency of liquid resources available to the clearinghouse.
- *Pre-trading risk (LiNe)*: a system that verifies the compliance of every order received by the trading system with the limits set for the customer by the respective intermediary before its insertion into the order book, rejecting orders that infringe any limit. Use of the system is mandatory for customers with direct market access (DMA 3 and DMA 4) and high-frequency traders.

Foreign Exchange Clearinghouse

- *Risk analysis*: a system that evaluates acceptance of new transactions based on the sufficiency of collateral posted and the trading limits set by the clearinghouse for participants. (The clearinghouse uses a pre-margin model; for more information, see under Principle 6, Key Consideration 3).
- *Collateral management*: see the description of the system used by BM&FBOVESPA Clearinghouse.
- *Pre-trading risk*: a system that verifies the compliance of every order received by the trading system with the trading limit set for the participant and the amount of collateral posted before its insertion into the trading system.
- *Backtesting*: a system for backtesting the margin model.
- *Liquidity testing*: a system that analyses the sufficiency of liquid resources available to the clearinghouse.

BM&FBOVESPA Clearinghouse's risk management systems replicate in their structure the individual customer segregation model adopted by BM&FBOVESPA for identifying and segregating positions and collateral. Risk calculation and margin requirement are defined at the level of the individual customer, while open position concentration limits and limits for collateral composition also apply to economic groups or groups of investors acting jointly. Risk management reports present exposures at all

possible levels, i.e. by customer (and groups of customers), aggregated by intermediary, and aggregated by clearing member. In the case of the Foreign Exchange Clearinghouse, the “customer” is the clearinghouse participant.

The effectiveness of the risk management policies, procedures and management systems is reviewed periodically in accordance with the following governance structure:

- The Board of Directors periodically receives recommendations from the Risk and Financial Committee, Executive Board and Audit Committee for the purposes of analysing and reviewing the clearinghouse risk profile and any changes to risk policies considered necessary.
- The Market Risk and Credit Risk Technical Committees continuously review the key aspects and risk factors that affect the clearinghouses, suggesting any changes they deem necessary.
- Internal Controls, Compliance and Corporate Risk Department periodically reviews the model, while Auditing Department conducts assessments of key processes.
- Risk Management Department executes risk management procedures and monitors the performance of models, criteria and systems on a daily basis, proposing improvements when necessary.
- Outside auditors review the key components of the model annually.
- The Risk Analysis Advisory Committee, which consists of representatives of participants in BM&FBOVESPA’s clearinghouses, including investors, meets periodically and may present suggestions for improvements to the risk management model.

Furthermore, the model is subject to authorisation by BCB. Besides prior approval of the clearinghouses’ rulebooks and manuals, BCB conducts annual on-site inspections and continuously reviews the effectiveness of the risk management policies, procedures and systems using the reports and other information supplied to it every day (such as backtesting results, data on positions, exposures, collateral posted etc). In accordance with the policy established by BM&FBOVESPA’s Market Risk Technical Committee, the risk management methodologies are reviewed internally at least once a year, and the committee may require interim reviews whenever deemed necessary.

Key Consideration 2 - *An FMI should provide incentives to participants and, where relevant, their customers to manage and contain the risks they pose to the FMI.*

BM&FBOVESPA provides incentives and the necessary means for participants to manage and mitigate the risks associated with transactions under their responsibility.

Besides offering ample access to all information of material relevance to risk management (individual limits and exposures, for example), BM&FBOVESPA disseminates the methodologies and parameters used to calculate margin requirement, value collateral and set trading limits, among others. Participants have direct electronic access to clearinghouse systems to perform their functions in post-trading processes (allocation, settlement, collateral management, risk monitoring, margin requirement lookup etc). Thus the clearinghouses offer access to the full array of tools needed by

participants to manage risk as rigorously as BM&FBOVESPA, including access to the risk simulation tool.

Finally, participants are audited periodically by BSM, which reviews their processes for customer registration, suitability, order execution, trade settlement, asset and position custody management, and risk management, as well as their governance of investment agents, internal controls, supervision of transactions, money laundering prevention, certification of professionals, information security, business continuity, IT infrastructure monitoring and operation, change management, and infrastructure support.

A degree of shared responsibility and the safeguard structure of BM&FBOVESPA's clearinghouses promote an adequate alignment of interests between participants and clearinghouses, incentivising active engagement in risk management practices. The co-responsibility structure formalises obligations between participants with regard to settlement obligations (i.e. between customers and their intermediaries, between intermediaries and their clearing members, and between clearing members and clearinghouse), while the safeguard structure delineates the elements "defaulters pay", "survivors pay", and BM&FBOVESPA's own capital (in the shape of its contribution to the settlement fund and additional cash earmarked to the clearinghouse). See under Principle 4, Key Consideration 1 for more details.

Key Consideration 3 - *An FMI should regularly review the material risks it bears from and poses to other entities (such as other FMIs, settlement banks, liquidity providers, and service providers) as a result of interdependencies and develop appropriate risk-management tools to address these risks.*

Regular reviews of material risks arising from other entities are part of BM&FBOVESPA's overall risk management framework. These risks are reviewed by means of updates to the relationship matrix under the responsibility of the Credit Risk Technical Committee. The reviews form the basis for the development of business continuity plans (BCPs) in which the material risks are addressed. Furthermore, the map of clearinghouse processes is updated by Internal Controls, Compliance and Corporate Risk Department from time to time or when requested, and the risks associated with each process are reviewed as part of such updates.

BM&FBOVESPA's clearinghouses are not linked to other exchanges and have no interdependencies with other settlement service providers or central counterparties, settling only transactions performed in the markets managed by BM&FBOVESPA.

For cash settlement in local currency, the clearinghouses use BCB's reserve transfer system directly (central bank money). For settlement in US Dollars, they use top-tier correspondent banks in New York. With regard to the collateral posted by participants, the clearinghouses have links to CSDs, registration systems and banks depending on the type of asset (SELIC, BM&FBOVESPA Central Depository, CETIP, and top-tier banks in Brazil and New York).

Thus BM&FBOVESPA's clearinghouses are exposed to the following risks due to interdependencies with other entities:

- Failures of IT systems in the entities holding collateral posted by participants;
- Failures of banks that provide liquidity, banks with which BM&FBOVESPA deposits its own funds for clearinghouses, and correspondent banks (New York), especially where such banks are clearing members;
- Failures by suppliers of IT systems.

In the first two cases, the critical scenario would materialise only in the hypothetical case of application of the procedures used to deal with default by clearing members. To address this risk, BM&FBOVESPA's clearinghouses have safeguards that include settlement funds, access to liquidity assistance facilities, and indirect access to BCB's discount window via BM&FBOVESPA Bank, as well as BM&FBOVESPA's own cash reserves dedicated to the clearinghouses. The banks that provide liquidity are among the largest in Brazil. BM&FBOVESPA's cash reserves dedicated to the clearinghouses and the funds that constitute BM&FBOVESPA's contribution to the settlement funds must be invested in accordance with the restrictions imposed by BM&FBOVESPA's Financial Investment Policy to assure the immediate availability of funds.

In the third case, the risk of IT system supplier failures is not very significant because most clearinghouses' systems were developed in house. The main exception is BM&FBOVESPA Clearinghouse's clearing platform, which was developed externally, but the contract calls for the transfer of know-how to BM&FBOVESPA and access by BM&FBOVESPA to the source code.

Key Consideration 4 - *An FMI should identify scenarios that may potentially prevent it from being able to provide its critical operations and services as a going concern and assess the effectiveness of a full range of options for recovery or orderly wind-down. An FMI should prepare appropriate plans for its recovery or orderly wind-down based on the results of that assessment. Where applicable, an FMI should also provide relevant authorities with the information needed for purposes of resolution planning.*

BM&FBOVESPA engaged a firm of consultants with global operations to deliver an international benchmarking exercise covering the scenarios used in the recovery plans of the internationally most important CCPs. After evaluating the sixteen scenarios in the benchmarking report, BM&FBOVESPA identified four scenarios capable of constituting a threat to its business continuity and viability, as shown below, and proposed a specific recovery plan for each one.

1. Temporary insufficiency of funds in local currency to discharge BM&FBOVESPA Clearinghouse's cash settlement obligations in the event of default by one or more participants.
2. Definitive insufficiency of funds in local currency to discharge the obligations arising from a participant's default or from closeout of the defaulting participant's portfolio in BM&FBOVESPA Clearinghouse.
3. Impossibility of concluding closeout of a defaulting participant's portfolio in BM&FBOVESPA Clearinghouse in the requisite timeframe.

4. Cyberattacks on BM&FBOVESPA Clearinghouse’s settlement system.

The other scenarios were not considered mission-critical for the reasons shown in the table below, and no recovery plans were therefore required for these cases.

Scenario	Remarks
Losses to BM&FBOVESPA’s investment portfolio including investment of collateral posted in cash by participants	BM&FBOVESPA’s investment policy covers investment in Brazilian government bonds and government bond repos.
Low liquidity of the securities in which BM&FBOVESPA invests	BM&FBOVESPA’s investment policy restricts investment to liquid securities and instruments with daily liquidity.
Failure of BM&FBOVESPA’s trading or settlement platforms	BM&FBOVESPA has operational contingency plans for the most important systems, including the trading and settlement systems.
Operational failure of BCB’s Reserve Transfer System (STR), which processes cash settlement by BM&FBOVESPA Clearinghouse	BCB and the market participants that use settlement services are working on an operational contingency plan.
Operational failure of one or more custody agents engaged by BM&FBOVESPA	BM&FBOVESPA is its own custodian in SELIC, in BM&FBOVESPA Central Depository and in CETIP. The collateral posted by participants is linked to BM&FBOVESPA Clearinghouse’s accounts with CSDs and the clearinghouse’s approval is required for any movement of such collateral.
Impact of BCB’s actions	From the regulatory standpoint, in addition to complying with the regulatory framework BM&FBOVESPA monitors applicable changes so as to assess the impact on its business and identify opportunities to enhance its processes.
Poor performance by service providers and suppliers	BM&FBOVESPA operates with high availability, redundancy and disaster recovery for all IT infrastructure providers, so as to minimise the impact of failure by its suppliers and service providers. In addition, the performance of critical providers is monitored in terms of compliance with contractual requirements.
Unforeseen cash outgoings	BM&FBOVESPA only invests in highly liquid securities that can be rapidly monetised, as established by the investment policy approved by its Board of Directors. In addition, BM&FBOVESPA maintains liquidity facilities to support the operations of its clearinghouses in the event of liquidity requirements triggered by participants’ settlement failures.

Scenario	Remarks
Internal or external fraud and/or other criminal activities	<p>BM&FBOVESPA has implemented an anti-fraud program to detect internal fraud and refine its control environment. Indicators and procedures are used to monitor critical transactions by BM&FBOVESPA Central Depository and detect any pressure factors involving employees with access to inside information. Indicators to monitor CCP processes are also being created.</p> <p>Furthermore, BM&FBOVESPA offers a channel for complaints and whistleblowing operated by a specialised independent company. A code of conduct committee is responsible for analysing all reports and complaints, including those made anonymously, conducting investigations and deciding on action in cases of proven infringement. To date BM&FBOVESPA has not received any reports of internal fraud.</p>
Loss of related revenue	<p>BM&FBOVESPA has experienced loss of revenue due to operational failure in the fee settlement process. A historical analysis of these occurrences shows a very low impact.</p>
Legal liability not specific of BM&FBOVESPA's business as central counterparty	<p>BM&FBOVESPA and its subsidiaries are parties to administrative and judicial proceedings involving tax, labor law and civil claims. Provision for losses in these cases has been made in accordance with the guidelines established by CVM Ruling 594/09. Possible losses are reported in BM&FBOVESPA's reference form, as well as significant remote losses as defined by BM&FBOVESPA.</p>
Losses resulting from links and interdependencies between BM&FBOVESPA and its partners, affiliates and/or internal or external service providers	<p>BM&FBOVESPA has identified its interdependencies with partners, affiliates and internal and external service providers, and has established processes to monitor the results of these interdependencies. The historical analysis so far has not shown any losses therefrom.</p>

The first version of BM&FBOVESPA Clearinghouse's recovery plan was submitted to BCB in December 2016. BCB had not provided any feedback when this document was published. It should be stressed, however, that BM&FBOVESPA's rules allow the clearinghouse to use some of the measures and tools stipulated in the recovery plan. In other words, BM&FBOVESPA Clearinghouse can take the necessary action, regardless of the plan's approval.

The provisions contained by the aforementioned rules for the use of these tools deal with special situations - for BM&FBOVESPA and the Brazilian financial market - requiring emergency measures. Although there is no specific reference to the recovery plan in the rules, an event triggering the recovery plan would undoubtedly be characterised as a special situation justifying emergency

measures. BM&FBOVESPA Clearinghouse's rules (article 180-I) empowers the CEO to define the situations or events that require the implementation of emergency measures.

In this sense, BM&FBOVESPA Clearinghouse is already capable of executing the following tools:

- (i) To allocate uncovered losses caused by participant default
 - Postpone the full or partial settlement of CCP payment to creditor clearing members another day;
 - Total or partial default on payment of the multilateral net balance to a clearing member;
 - Use BM&FBOVESPA's free cash flow.

It should be noted that although the rulebook considers and treats the case in which the clearinghouse fails to pay the multilateral net balance due to a clearing member, it does not spell out the criteria for allocating losses among clearing members.

- (ii) To address uncovered liquidity shortfalls caused by participant default
 - Postpone the total or partial settlement of clearinghouse payment to creditor clearing members on the same day;
 - Postpone the total or partial settlement of clearinghouse payment to creditor clearing members to another day;
 - Replace financial settlement by in-kind settlement;
 - Use BM&FBOVESPA's free cash flow.

- (iii) To replenish financial resources and to allocate losses caused by participant default

- Use BM&FBOVESPA's free cash flow;
- Issue debt;
- Reduce dividend payout to the limit permitted by law;
- Reduce compensation paid to BM&FBOVESPA's executives;
- Sell BM&FBOVESPA's assets.

- (iv) For the clearinghouse to re-establish a matched book in the event that a participant's portfolio cannot be closed out

- Holding an auction to close out the defaulting participant's portfolio;
- Tear-up contracts.

The recovery plan proposes additional tools, as well as formulating the provisions contained in the rulebook in the language and structure proper to a recovery plan.

PRINCIPLE 4 – CREDIT RISK

PRINCIPLE 4 – CREDIT RISK: *An FMI should effectively measure, monitor, and manage its credit exposure to participants and those arising from its payment, clearing, and settlement processes. An FMI should maintain sufficient financial resources to cover its credit exposure to each participant fully with a high degree of confidence. In addition, a CCP that is involved in activities with a more-complex risk profile or that is systemically important in multiple jurisdictions should maintain additional financial resources sufficient to cover a wide range of potential stress scenarios that should include, but not be limited to, the default of the two largest participants and their affiliates that would potentially cause the largest aggregate credit exposures to the CCP in extreme but plausible market conditions. All other CCPs should maintain, at a minimum, total financial resources sufficient to cover the default of the one participant and its affiliates that would potentially cause the largest aggregate credit exposures to the CCP in extreme but plausible market conditions.*

Key Consideration 1 - *An FMI should establish a robust framework to manage its credit exposures to its participants and the credit risks arising from its payment, clearing, and settlement processes. Credit exposure may arise from current exposures, potential future exposures, or both.*

The framework for managing credit risk exposure to participants in BM&FBOVESPA's clearinghouses includes the following components:

- *Admission criteria:* rules and minimum operational and financial requirements, among others, for the admission of clearing members and intermediaries, as well as maintenance of access authorisation in the case of already admitted participants. Risk Management Department and BSM independently monitor compliance by participants with the criteria for admission.
- *Co-responsibility structure:* defines credit relationships and hence responsibilities between investors and intermediaries, intermediaries and clearing members, and clearing members and the clearinghouse.
- *Safeguard structure:* a tiered structure of guarantees designed to absorb potential losses associated with default by one or more participants. The guarantees are sized in accordance with a stress test methodology. Current exposures and potential future exposures define the total value of the guarantees required for the safeguard structure, especially margin requirement (see under Principle 6 for more information on the margining model). BM&FBOVESPA Clearinghouse's safeguard structure consists of margin requirement, minimum nonoperating collateral and a settlement fund (to which clearing members and BM&FBOVESPA contribute). The Foreign Exchange Clearinghouse's safeguard structure consists of margin requirement and a settlement fund (to which clearinghouse participants and BM&FBOVESPA contribute).
- *BM&FBOVESPA's cash:* own funds earmarked to coverage of clearinghouse risks. The amount of cash to be allocated is sized, like the rest of the safeguard structure, so as to cover at least a

scenario in which two clearing members default simultaneously (Cover 2) that would potentially cause the largest aggregate credit exposure for the clearinghouse in market conditions given by more severe market risk scenarios than those used to calculate margin requirement.

- *Daily mark-to-market*: daily calculation of market value for all open positions and collateral, resulting in daily revisions of margin requirement and settlement values.
- *Intraday and daily margin calls*: assurance of adequate amounts of guarantees available in the safeguard structure.
- *Open position concentration limits*: upper limits for long and short positions per instrument and investor or group of investors (investors belonging to the same business conglomerate or acting jointly, for example), applicable to the sum of an investor's positions under all related intermediaries and the respective clearing members.
- *Daily price fluctuation limits*: limits for positive and negative variations in the prices of instruments in each trading session, so as to limit the daily amounts to be settled via clearinghouses.
- *Collateral limits* (BM&FBOVESPA Clearinghouse): upper limits for the use of certain types of asset as collateral, such as limits for illiquid collateral and private issuers. The limits apply to collateral posted by an investor (or group of investors) aggregated under all intermediaries linked to the investor and their clearing members, as well as collateral posted by intermediaries and their clearing members. For participants that trade in more than one category (investor and/or intermediary and/or clearing member), the limits apply in toto to all collateral posted by such a participant, including the collateral posted by participants that belong to the same conglomerate.
- *Intraday risk limit* (BM&FBOVESPA Clearinghouse): a limit assigned to each intermediary (full trading participants and settlement participants) for the highest collateral deficit allowed during the day in transactions under its responsibility. The clearinghouse's intraday risk system monitors intermediaries' collateral deficits during the day to permit same-day risk coverage.
- *Trading limit* (Foreign Exchange Clearinghouse): maximum exposure to risk associated with transactions executed by participants without additional collateral being required.
- *Pre-trading risk limits*: limits assigned by intermediaries to their customers for the purpose of controlling pre-trading risk (assessing risks associated with orders before insertion into the trading system). High-frequency traders and customers with direct market access (types DMA 3 and DMA 4) must use the pre-trading risk control tool offered by BM&FBOVESPA, which applies ceilings to customer limits.
- *Participant monitoring*: daily monitoring by Credit Risk Management of clearinghouse participants' credit quality and liquidity conditions (including certain investors considered relevant by BM&FBOVESPA, and private issuers of securities accepted as collateral).

The clearinghouses do not incur third-party credit risk in connection with settlement in local currency, since each clearinghouse is solely responsible for execution of these activities and uses its own account with BCB in the Reserve Transfer System (STR) to receive and make payments from and

to its clearing members. For settlement in US Dollars, the correspondent banks used by the clearinghouses are submitted periodically to credit assessments by the Credit Risk Technical Committee.

The credit exposure management framework is reviewed whenever enhancements are necessary owing to changes in the trading, clearing and settlement environments, changes in market practices, or new product launches. Changes to the framework are subject to prior approval by the Market Risk and Credit Risk Technical Committees, Executive Board, Board of Directors, and BCB.

Key Consideration 2 - *An FMI should identify sources of credit risk, routinely measure and monitor credit exposures, and use appropriate risk-management tools to control these risks.*

BM&FBOVESPA faces three main types of credit risk: (i) the risk of financial losses associated with failure by providers of infrastructure for settlement processes; (ii) the risk of losses due to default by one or more participants, associated with the market and liquidity risks inherent in closeout of positions and collateral execution; and (iii) the credit risk associated with issuers of assets used in the clearinghouses' safeguard structures.

Sources of credit risk are identified by Risk Management Department and the Credit Risk Technical Committee.

BM&FBOVESPA monitors credit exposure every day using credit stress tests that assume default by participants and their affiliates. The financial impact of such defaults is simulated using the CORE methodology, assuming market risk scenarios of greater severity than those used to calculate margin requirement.

The credit quality of participants, collateral issuers and infrastructure suppliers is assessed using external metrics (balance sheet data at the same level of detail as is available to BCB, information disclosed by credit rating agencies, and market indicators) and internal metrics (daily settlement volumes, margin requirements and collateral posted, for example). If a participant's credit quality deteriorates, BM&FBOVESPA can take steps to reduce its exposure, such as lowering the limits assigned to the participant and requiring additional collateral. If a participant is undergoing bankruptcy, reorganisation, intervention or court-ordered or out-of-court liquidation, BM&FBOVESPA can also prohibit new transactions that cause an increase in exposure, determine position closeout, and cancel the participant's access authorisation.

BM&FBOVESPA Clearinghouse

BM&FBOVESPA Clearinghouse monitors its credit exposure on an ongoing intraday basis and at the end of each day.

In intraday monitoring, the operating balance (**OB**) of each intermediary (full trading participants and settlement participants) is monitored by the intraday risk system. For this purpose the system recalculates the risk of each customer and each intermediary approximately every 20 minutes

throughout the day, considering the positions, trades and movement of collateral performed until the moment of calculation.

The operating balance is given by the difference between (a) the intraday risk limit (**IRL**) assigned by BM&FBOVESPA (and reducible by the clearing member) plus the collateral (**C**) posted by the intermediary or its clearing member to raise the limit, and (b) the intraday risk of the intermediary (**Risk**), i.e. $OB = IRL + C - Risk$. The intermediary's intraday risk has four parts: one part referring to the risk of trades not yet allocated to customers, calculated without netting out buy and sell trades; a second part referring to the residual risk of allocated customer-collateralized trades, given by the sum of the highest collateral deficits associated with the accounts of such customers (relative to customer-collateralized positions and the corresponding collateral); a third part referring to allocated participant-collateralized trades, which considers all trades collateralized by participants; and a fourth part referring to any additional margin (e.g. if an open interest concentration limit is breached).

The intermediary must keep its operating balance positive ($OB > 0$) throughout the day and must take the necessary steps to ensure this. If $OB < 0$, the clearinghouse sets a deadline (on the same day) for the intermediary to comply by posting its own collateral, allocating unallocated trades, requiring customers to post intraday collateral, and/or performing risk-mitigating trades. If the intermediary fails to comply by the deadline, the clearinghouse may require the clearing member to post intraday collateral of its own, among other measures.

At the end of the day all exposures are recalculated at the level of the customer on the basis of updated positions, collateral, and closing or settlement prices. The results indicate whether extra collateral or margin calls are needed. If so, they must be covered on the next business day.

Both to calculate margin requirement for customers and participants at the end of the day and for intraday monitoring, risk is calculated using the CORE methodology, which consists of a stress test methodology to estimate the worst cash flow accumulating during the process of closing out a defaulter's portfolio, considering a closeout horizon of up to ten days, full valuation, a confidence level of at least 99.96% and heavy-tailed distributions for all contracts considered systemically relevant (for details of CORE, see under Principle 6, Key Consideration 3).

The clearinghouse's rulebook and risk management manual contain a detailed description of the procedures for calculating risk and margin, and for intraday risk monitoring.

Foreign Exchange Clearinghouse

The Foreign Exchange Clearinghouse uses the pre-margin model whereby advance posting of collateral is a necessary condition for acceptance of transactions.

The clearinghouse assigns each participant a trading limit, which represents the largest long or short position the participant may hold on each settlement date without having to post extra collateral. The participant's exposure is updated by adding the amount of a new transaction to the cleared net balance for each settlement date (T+0, T+1 and T+2) and the new situation is compared with its trading limit. Exposure is calculated using the stress test method and considering market risk scenarios with a confidence level of at least 99.96%. Any transaction that would result in a higher

exposure than the trading limit assigned is accepted only after the extra collateral required has been deposited.

Besides prior posting of collateral, therefore, the clearinghouse may require extra collateral, including on an intraday basis, from participants whose marked-to-market balances pending settlement present a risk to the clearinghouse's settlement process.

There are three trading limits (L1, L2 and L3) that involve the entire exposure of the settlement cycle. Limits L1 and L2 are based on the Foreign Exchange Clearinghouse's assessment of the participants' credit risk and entail different margin levels. Limit L3, which is identical for all participants, represents a critical threshold above which pre-settlement of a trade is required by depositing the full amount that exceeds the limit.

The clearinghouse's rulebook and risk management manual contain a detailed description of the procedures for calculating risk and margin.

Key Consideration 3 - *A payment system or SSS should cover its current and, where they exist, potential future exposures to each participant fully with a high degree of confidence using collateral and other equivalent financial resources (see Principle 5 on collateral). In the case of a DNS payment system or DNS SSS in which there is no settlement guarantee but where its participants face credit exposures arising from its payment, clearing, and settlement processes, such an FMI should maintain, at a minimum, sufficient resources to cover the exposures of the two participants and their affiliates that would create the largest aggregate credit exposure in the system.*

See under Key Consideration 4.

Key Consideration 4 - *A CCP should cover its current and potential future exposures to each participant fully with a high degree of confidence using margin and other prefunded financial resources (see Principle 5 on collateral and Principle 6 on margin). In addition, a CCP that is involved in activities with a more-complex risk profile or that is systemically important in multiple jurisdictions should maintain additional financial resources to cover a wide range of potential stress scenarios that should include, but not be limited to, the default of the two participants and their affiliates that would potentially cause the largest aggregate credit exposure for the CCP in extreme but plausible market conditions. All other CCPs should maintain additional financial resources sufficient to cover a wide range of potential stress scenarios that should include, but not be limited to, the default of the participant and its affiliates that would potentially cause the largest aggregate credit exposure for the CCP in extreme but plausible market conditions. In all cases, a CCP should document its supporting rationale for, and should have appropriate governance arrangements relating to, the amount of total financial resources it maintains.*

BM&FBOVESPA Clearinghouse and the Foreign Exchange Clearinghouse have their respective safeguard structures to cover current exposures and potential credit exposures. In each

clearinghouse, the safeguard structure consists of collateral posted by participants and a settlement fund (FLI in BM&FBOVESPA Clearinghouse; FLOC in the Foreign Exchange Clearinghouse). In the event of participant default, these can be promptly accessed by the clearinghouse concerned.

BM&FBOVESPA Clearinghouse

BM&FBOVESPA Clearinghouse's safeguard structure must be used in the following order in the event of default:

1. Collateral posted by the defaulting customer (margin requirement, including additional margin).
2. Collateral posted by the defaulting intermediary.
3. Collateral posted by the defaulting clearing member, except its contribution to the FLI.
4. FLI - defaulting clearing member's contribution.
5. FLI - BM&FBOVESPA's contribution.
6. FLI - non-defaulting clearing members' contributions.
7. BM&FBOVESPA's cash exclusively earmarked for the clearinghouse.

The intermediary's collateral (item 2) means the collateral posted by an intermediary to raise its intraday risk limit and achieve the minimum non-operating collateral (access requirement), as well as any extra collateral. The same applies to the clearing member's collateral (item 3).

The customer's margin requirement and the intermediary's intraday risk are determined using a portfolio (positions plus collateral) risk assessment methodology, assuming extreme market conditions (scenarios for variations in risk factors – prices, rates and volatilities – that affect the value of positions and collateral), with a risk horizon of up to ten days, considering heavy-tailed distributions, and with a confidence level of at least 99.96% for variations in risk factors considered systemically important (CORE methodology). The scenarios for such variations include historical, quantitative and prospective scenarios.

A credit stress test is used to assess the level of protection afforded by the safeguard structure, which should be at least N=2 largest participants (Cover 2). A daily check is performed to ensure that BM&FBOVESPA's cash dedicated to the clearinghouse, as established by the Board of Directors, together with the other elements of the safeguard structure, is sufficient to cover simultaneous default by the two largest participants, with a higher confidence level for market risk than the level used to calculate margin requirement.

The FLI consists of variable contributions made by clearing members according to risk band (measured monthly on the basis of daily margin requirements in the six months prior to the date of measurement), and a fixed contribution by BM&FBOVESPA. BM&FBOVESPA's contribution is R\$600 million and represents roughly 50% of the fund. If the settlement fund is used in toto or in part, the funds later injected to replenish it must not be used to cover losses due to the same default.

Foreign Exchange Clearinghouse

The Foreign Exchange Clearinghouse's safeguard structure must be used in the following order in the event of default:

1. Collateral posted by the defaulting participant
2. FLOC - defaulting participant's contribution
3. FLOC - BM&FBOVESPA's contribution
4. FLOC - non-defaulting participants' contributions

The FLOC comprises fixed contributions by clearing members and a contribution by BM&FBOVESPA. BM&FBOVESPA's contribution represents at least 50% of the fund, since the clearinghouse rules state that it must be at least equal to the total amount required from clearing members. As in the case of the FLI, if the FLOC is used in toto or in part, the funds later injected to replenish it must not be used to cover losses due to the same default. The FLOC contribution required from each participant is defined on the basis of its trading limit.

Participant risk is calculated using a stress test with a two-day risk horizon and assuming heavy-tailed distributions for exchange-rate variation, with a confidence level of at least 99.96%.

As in the case of BM&FBOVESPA Clearinghouse, a credit stress test is used to assess the level of protection afforded by the safeguard structure, and a daily check is performed to ensure that BM&FBOVESPA's cash dedicated to the clearinghouse, as established by the Board of Directors, together with the other elements of the safeguard structure, is sufficient to cover simultaneous default by the two largest participants, with a higher confidence level for market risk than the level used to calculate margin requirement.

All definitions relating to the clearinghouses' safeguard structures (calculation methodologies and parameters, use criteria, assets accepted as collateral etc.) are published on BM&FBOVESPA's website and in the clearinghouses' rulebooks and risk management manuals. The values of collateral posted to cover margin requirements by type of asset accepted are also published on BM&FBOVESPA's website.

To ensure that the safeguard structures provide adequate coverage, BM&FBOVESPA defines the minimum level of cash it must have in hand for dedicated use by the clearinghouses if residual losses remain after the settlement funds have been fully used in the event of default. This minimum cash requirement is established by the Board of Directors on the basis of a recommendation by the Risk and Financial Committee. The committee's recommendation is based on the aforementioned credit stress test, using more severe market risk scenarios than those used to calculate margin requirements, as well as the minimum coverage required by the regulator and BM&FBOVESPA's risk appetite.

Key Consideration 5 - *A CCP should determine the amount and regularly test the sufficiency of its total financial resources available in the event of a default or multiple defaults in extreme but plausible market conditions through rigorous stress testing. A CCP should have clear procedures to report the results of its stress tests to appropriate decision makers at the CCP and to use these results to evaluate*

the adequacy of and adjust its total financial resources. Stress tests should be performed daily using standard and predetermined parameters and assumptions. On at least a monthly basis, a CCP should perform a comprehensive and thorough analysis of stress testing scenarios, models, and underlying parameters and assumptions used to ensure they are appropriate for determining the CCP's required level of default protection in light of current and evolving market conditions. A CCP should perform this analysis of stress testing more frequently when the products cleared or markets served display high volatility, become less liquid, or when the size or concentration of positions held by a CCP's participants increases significantly. A full validation of a CCP's risk-management model should be performed at least annually.

As mentioned under the previous Key Considerations to this Principle 4, stress testing is inherent in the margin calculation models and intraday risk management procedures that determine financial resources in the form of guarantees deposited with the safeguard structures of BM&FBOVESPA's clearinghouses. Thus these resources reflect participants' current risk profile and ultimately that of the clearinghouses, considering market risk scenarios with a severity of at least 99.96% (which represents 1 crisis every 10 years or more) applied to marked-to-market positions and collateral.

Risk Management Department monitors the adequacy of the margining model's parameters and assumptions every day using (i) a daily margin backtesting procedure for all portfolios, and (ii) daily monitoring of the market risk scenarios, which are compared with the observed variations in market prices. Any violations detected using procedures (i) and (ii) are analysed by Risk Management Department and submitted to the Market Risk Technical Committee, potentially leading to a revision of the parameters and/or the model. The results of the portfolio margin backtests are reported to BCB on a daily basis.

In addition to and independently from the margin backtesting procedure, the Market Risk Technical Committee re-examines every fortnight or whenever deemed necessary the parameters of the margining methodology and credit stress test, such as the scenarios for risk factors.

BM&FBOVESPA's cash dedicated to the clearinghouses, established by the Board of Directors in accordance with the recommendation of the Risk and Financial Committee, is also calculated using a daily stress test.

As noted under Key Consideration 2, the Risk Management Department monitors credit exposure every day using a credit stress test. The credit exposure resulting from the test is the threshold for the total amount of financial resources available in the safeguard structure required to obtain the desired level of coverage in more extreme market conditions than those assumed for the purposes of calculating margin requirement. Any actual or potential breach of this threshold is reported to the Chief Operating Officer, who may choose the action or actions to be taken to restore the desired coverage: increasing customers' margin requirement, lowering the concentration for open positions, and requiring additional margin from specific customers. The result of the test is also reported to the Board of Directors and its Risk and Financial Committee every month or whenever deemed necessary. Having consulted the Risk and Financial Committee, the Board of Directors may decide to restore the

desired level of coverage by raising the amount of the required contributions to the settlement fund and increasing BM&FBOVESPA's cash earmarked to the clearinghouses for risk coverage purposes.

In recent years BM&FBOVESPA's cash dedicated to the clearinghouses, established by the Board of Directors, together with the other elements of the safeguard structures, assured sufficient funds to cover N=2 largest participants.

Internal Controls, Compliance and Corporate Risk Department independently performs monthly simulations of the possible financial impact of several scenarios of participant default on the funds available for the treatment of such failures.

Key Consideration 6 - *In conducting stress testing, a CCP should consider the effect of a wide range of relevant stress scenarios in terms of both defaulters' positions and possible price changes in liquidation periods. Scenarios should include relevant peak historic price volatilities, shifts in other market factors such as price determinants and yield curves, multiple defaults over various time horizons, simultaneous pressures in funding and asset markets, and a spectrum of forward-looking stress scenarios in a variety of extreme but plausible market conditions.*

Given that the margin calculation methodology consists of a stress test, a large number of scenarios are taken into account for each of the risk factors that influence the prices of assets and derivatives, such as exchange rates, yield curves, stock indices, commodity prices and volatility surfaces. The scenarios are developed by the Market Risk Technical Committee and consist of forward-looking scenarios, historical scenarios (January 2002 to May 2016) and quantitative scenarios (for details of each type of scenario, see under Principle 6). The stress scenarios used for margining include (i) all ten-day price trajectories observed in the market from 2002 until May 2016 (historical simulations), (ii) price trajectories generated by statistical models that use heavy-tailed distributions and incorporate the joint movement of prices using the copula technique (Monte Carlo simulations), and (iii) prospective scenarios defined by the Market Risk Technical Committee, considering the possibility of a "correlation break" between the main risk factors. All told, 10,000 scenarios are developed and used for all risk factors (i.e. 10,000 sets, each of which contains a scenario for the trajectory of each risk factor for a horizon of 1-10 days). Thus the margining system uses 10,000 scenarios to compute margin requirement for each customer, even in intraday processing. BM&FBOVESPA can alter any scenario without notice if necessary.

In assessing BM&FBOVESPA's cash dedicated to the clearinghouses, the Risk and Financial Committee tests scenarios with escalating levels of severity (market risk scenarios with greater severity than those used to calculate margin requirement and scenarios assuming simultaneous default by escalating numbers of participants). The committee itself develops these scenarios. As noted above, the results of the daily credit stress test are also analysed.

Key Consideration 7 - *An FMI should establish explicit rules and procedures that address fully any credit losses it may face as a result of any individual or combined default among its participants with*

respect to any of their obligations to the FMI. These rules and procedures should address how potentially uncovered credit losses would be allocated, including the repayment of any funds an FMI may borrow from liquidity providers. These rules and procedures should also indicate the FMI's process to replenish any financial resources that the FMI may employ during a stress event, so that the FMI can continue to operate in a safe and sound manner.

BM&FBOVESPA's clearinghouse risk management rules and manuals clearly establish the rules for covering losses due to participant default, in particular the following:

- The responsibilities of each participant in the obligation settlement chain (i.e. customers, intermediaries and clearing members), with regard to the posting of collateral or the flows of funds for trades and positions;
- A defaulting participant's obligation to identify to the clearinghouse the participant whose failure has caused the default (i.e. a defaulting clearing member's obligation to identify the defaulting intermediary and a defaulting intermediary's obligation to identify the defaulting customer).
- The rules for using the collateral posted by defaulting participants (customer, intermediary and clearing member) and the contributions of BM&FBOVESPA and non-defaulting clearing members to the settlement fund, including the order in which they are to be used (see the order in which collateral is to be used under Key Consideration 4).
- The possibility of using the collateral posted by defaulting participants and the settlement fund to reimburse liquidity providers if the liquidity assistance mechanisms have been used.

The only component of the safeguard structure that can be replenished after use due to participant default is the settlement fund. The rules for replenishment of the fund are set out in the clearinghouse rulebooks. The main rules are as follows:

- If BM&FBOVESPA's contribution is used, the Board of Directors may determine partial or total replenishment.
- If the contributions of non-defaulting clearing members are used, the clearinghouse sets a deadline for replenishment of the contributions concerned, and the contributions made for replenishment purposes may be used only to cover future defaults.
- The total value of contributions required from a clearing member to replenish the fund in any 20-day period is limited to three times the value of its contribution.
- Any clearing member that fails to discharge its obligation to replenish the settlement fund may be declared defaulter or operational defaulter by the clearinghouse.
- BM&FBOVESPA may implement a charge to recover the amount necessary to replenish the settlement fund, in which case the amount recovered is transferred to the non-defaulting clearing members that replenished the fund.

If losses due to the default remain after the settlement fund is fully utilized, BM&FBOVESPA may use its cash reserve dedicated to the clearinghouses.

Situations in which losses exceed the amount available in the safeguard structure are dealt with in BM&FBOVESPA Clearinghouse's recovery plan, the first version of which was submitted to BCB in December 2016. BCB had not provided any feedback when this document was published.

In addition, the clearinghouses' rulebooks also contain the applicable rules in the event of BM&FBOVESPA's bankruptcy or request for reorganisation, and in the event of non-payment by the clearinghouses to one or more clearing members, including position closeout and preservation of the net settlement of rights and obligations.

Some of the measures and tools called for by BM&FBOVESPA Clearinghouse's recovery plan – submitted to BCB, as mentioned under Principle 3, Key Consideration 4 – for coverage of losses due to participant default in excess of the safeguard structure can be implemented by BM&FBOVESPA Clearinghouse as of now in accordance with the rules already in force at BM&FBOVESPA. In other words, the clearinghouse can use them now, independently of the plan.

The provisions contained in the aforementioned rules for implementation of these tools deal with special situations, for BM&FBOVESPA and the Brazilian financial markets, that require emergency measures. Although there are no specific references to the recovery plan in the rules, any event that triggered the recovery plan would undoubtedly be classed a special situation and require emergency measures. The BM&FBOVESPA Clearinghouse rulebook (article 180-I) empowers BM&FBOVESPA's CEO to define the situations and events that require the implementation of emergency measures. For a more detailed description, see under Principle 3, Key Consideration 4.

PRINCIPLE 5 – COLLATERAL

PRINCIPLE 5 – COLLATERAL: *An FMI that requires collateral to manage its or its participants' credit exposure should accept collateral with low credit, liquidity, and market risks. An FMI should also set and enforce appropriately conservative haircuts and concentration limits.*

Key Consideration 1 - *An FMI should generally limit the assets it (routinely) accepts as collateral to those with low credit, liquidity, and market risks.*

The main criteria used by BM&FBOVESPA to determine whether a specific asset can be accepted as collateral are as follows:

- No legal obstacles to its use as collateral
- Pricing transparency and efficiency in trading and post-trading environments
- Minimum liquidity level
- Existence of liquidity providers
- It must be possible to estimate market and credit risk with a tolerable degree of accuracy
- In the case of private securities, such as CDs, LCIs, LCAs and bank letters of credit, the issuer must comply with the applicable requirements established as conditions for access, as well as those established in the clearinghouse's rulebook and risk management manual.

BM&FBOVESPA's clearinghouses accept the following assets as collateral, besides cash in the form of Brazilian currency:

BM&FBOVESPA Clearinghouse

- Brazilian government bonds traded in Brazil
- Gold as a financial asset
- Shares of a stock issued by a publicly-traded company listed on BM&FBOVESPA
- Certificates of deposit of shares of a stock (units) issued by a publicly-traded company listed on BM&FBOVESPA
- American Depositary Receipts (ADRs) representing stocks eligible to be accepted as collateral*
- Bank certificates of deposit (CDs)
- Real Estate Letters of Credit Real estate credit bills (LCIs)
- Agribusiness Letters of Credit (LCAs)
- US dollars*

Foreign Exchange Clearinghouse

- Brazilian government bonds traded in Brazil
- US dollars

- US Treasury bonds*
- German Treasury bonds*
- Bank letters of credit (LCs)
- Exchange-traded fund (ETF) shares traded in Brazil
- Shares of the investment fund BM&FBOVESPA Margem Garantia Renda Fixa Referenciado DI Fundo de Investimento em Cotas de Fundos de Investimento (FIC)**
- Shares of the investment fund Fundo de Investimento Liquidez Câmara BM&FBOVESPA (FILCB)

(*) Only non-resident investors of types and jurisdictions specified in BM&FBOVESPA Clearinghouse’s risk management manual may use these assets as collateral.

(**) Fund designed specifically for constitution of collateral, with automatic pledge of fund shares to clearinghouse.

Market risk associated with collateral is mitigated through the application of shocks. Liquidity risk relating to collateral execution is mitigated by liquidity assistance facilities (see under Principle 7), and in the case of BM&FBOVESPA Clearinghouse also by the imposition of specific acceptance limits depending on the type of asset.

With regard to credit risk, BM&FBOVESPA Clearinghouse sets limits for issuers of CDs, LCIs, LCAs and bank letters of credit. In the following descriptions, the term “participants” refers to persons or entities that act as customers and/or intermediaries and/or clearing members.

- *Limits for acceptance of CDs, LCIs, LCAs and bank letters of credit:* Limits are assigned to each issuing bank by the Credit Risk Technical Committee, which takes into account quantitative and qualitative aspects that determine the bank’s credit quality. The committee can alter or block any limit at its sole discretion and at any time. The limits listed below apply to CDs, LCIs, LCAs and letters of credit issued by the same bank:
 - A limit for the total posted to the clearinghouse
 - A limit for the total posted by the same customer or customer group
 - A limit for the total posted by customers under the responsibility of or linked to an intermediary or clearing member linked to the issuing bank
 - A limit for the use of a master letter of credit
- *Limit for CDs, LCIs and LCAs with no early redemption clause:* A limit per participant or group of participants for posting collateral that consists of assets with restrictions or conditions regarding early redemption.

- *Limits for Brazilian government bonds posted as collateral for third parties:* Limits set by the clearinghouse for government bonds held by participants when posted as collateral for customers. These limits refer to total financial volume posted as third-party collateral and to the volume that can be distributed to the same third party. The clearinghouse grants these limits and their maintenance depends on the compliance with the procedures, parameters and conditions established in its manuals and rulebooks.
- *Limits for acceptance of stocks, ADRs, units and ETF shares:* A limit per asset for the total posted in the form of the asset by the same customer or group of customers. These limits are defined on the basis of the asset's liquidity.
- *Limit for use of illiquid collateral:* A limit for the total amount of illiquid assets posted as collateral by the same participant or group of participants, regardless of the other limits applicable to the assets concerned. The clearinghouse classes assets as liquid or illiquid according to the time taken to monetise them. Local currency, Brazilian government bonds, and bank letters of credit with same-day liquidity are classed as liquid. Other assets accepted as collateral are classed as illiquid. An upper limit is applied to the illiquid portion of collateral posted by each participant, including customers: this limit corresponds to a fraction of the funds available (see under Principle 7, Key Consideration 1, for details).
- *Limit for collateral posted abroad:* A limit granted by the clearinghouse to non-resident investors for collateral posted abroad, as a means of assuring compliance with the limit established by BCB Circular 3838/17. Based on operational criteria, the clearinghouse sets for each non-resident investor (i) a financial limit in BRL or (ii) a limit in the form of a percentage of the total margin required by the clearinghouse.

Besides these limits, other restrictions apply to collateral acceptance, such as not allowing persons linked to a given company to post securities issued by that company as collateral to mitigate wrong-way risk, for example.

The list of eligible assets, criteria for valuing collateral, criteria for limits and other restrictions are publicly available.

The Market Risk Technical Committee and Credit Risk Technical Committee review and assess the policies, practices and parameters relating to the posting of collateral at least once a month.

The asset types eligible for acceptance as collateral by BM&FBOVESPA's clearinghouses and the acceptance criteria and limits are established in the clearinghouses' rulebooks and manuals, which are approved by BCB. Any change in the list of accepted assets and in the acceptance criteria and limits requires approval by BCB.

BM&FBOVESPA's clearinghouses do not rehypothecate or reuse assets posted as collateral by participants.

Key Consideration 2 - *An FMI should establish prudent valuation practices and develop haircuts that are regularly tested and take into account stressed market conditions.*

BM&FBOVESPA Clearinghouse assesses market risk associated with a customer's collateral together with the customer's positions. The adequacy of collateral price variation scenarios is checked by backtesting the margining model.

All assets posted as collateral except CDs, LCIs, LCAs and bank letters of credit are marked to market daily at the closing price, and shocks representing market risk are then applied. The use of liquidity-based criteria for collateral acceptance mitigates the risk of distorted values due to marking assets posted as collateral to market.

Shocks applied after marking to market are given by the scenarios for price variation in the risk factors that determine the prices of assets posted as collateral. Their adequacy is verified as part of the validation of these scenarios, conducted every day by Risk Management Department and fortnightly or whenever necessary by the Market Risk Technical Committee.

Key Consideration 3 - *In order to reduce the need for procyclical adjustments, an FMI should establish stable and conservative haircuts that are calibrated to include periods of stressed market conditions, to the extent practicable and prudent.*

BM&FBOVESPA Clearinghouse calculates risk using the CORE methodology, which includes collateral valuation, so there is no need for procyclical adjustment to the market risk scenarios used. These scenarios are stable by definition, as described under Principle 6, Key Consideration 3.

The same applies to the Foreign Exchange Clearinghouse, since this clearinghouse's collateral is valued using the same market risk scenarios.

Key Consideration 4 - *An FMI should avoid concentrated holdings of certain assets where this would significantly impair the ability to liquidate such assets quickly without significant adverse price effects.*

Most of the collateral posted to BM&FBOVESPA's clearinghouses (more than 82% of the total in each clearinghouse) consists of Brazilian government bonds, considered the most liquid assets in the Brazilian market.

Posting of other eligible assets is subject to the limits mentioned under Key Consideration 1, which help avoid concentration. Because collateral posted to BM&FBOVESPA's clearinghouses is segregated by individual customer, concentrated holdings of certain assets are easily identifiable.

Key Consideration 5 - *An FMI that accepts cross-border collateral should mitigate the risks associated with its use and ensure that the collateral can be used in a timely manner.*

With regard to legal risk, in 2015 BM&FBOVESPA completed a study to review its acceptance of collateral posted abroad, concluding that such collateral enjoys the same legal certainty and the same degree of enforceability as collateral constituted in Brazil relative to certain types of collateral posted by certain types of non-resident investor domiciled in the United States, United Kingdom or France. The degree of legal certainty indicated by the study applies to collateral abroad accepted by BM&FBOVESPA Clearinghouse and the Foreign Exchange Clearinghouse, considering the types of asset accepted (see under Key Consideration 1) and the profile of the participants who currently use them as collateral for these clearinghouses.

With regard to the operational risk associated with access to collateral, Risk Management Department performs monthly collateral execution tests with the depository entities located abroad. In the case of USD, only cases in which conversion to local currency is required incur operational risk, which is the same as the operational risk usually associated with foreign-exchange transactions.

Market and liquidity risks are mitigated by the application of shocks for market risk, by the limit on illiquid collateral (BM&FBOVESPA Clearinghouse), and by the maintenance of liquidity facilities for fast conversion of USD into local currency.

Exposure to credit risk derives from the correspondent banks in New York, where collateral is deposited. To mitigate this risk, BM&FBOVESPA uses only top-tier banks, which are periodically monitored by Risk Management Department and the Credit Risk Technical Committee.

Key Consideration 6 - *An FMI should use a collateral management system that is well-designed and operationally flexible.*

The primary features of the collateral management system operated by BM&FBOVESPA's clearinghouses are as follows:

- Identification of the customer/depositor and segregation at the customer/depositor level, in accordance with each clearinghouse's account structure.
- Eligibility rules and limits by asset class to mitigate credit and liquidity risks.
- Real-time integration with risk and settlement systems, and with CSDs.
- Shocks and daily marking-to-market.
- Criteria and timetables for asset transfers.
- Execution rules (default events and order of use) and operational collateral execution capacity.
- Simulation tool.
- Access to information in the system and transfer instruction commands via messaging or in screen.

Collateral is never reused or rehypothecated, since all assets posted as collateral are transferred or linked to accounts held by the clearinghouse concerned with depository entities. Moreover,

segregation of collateral in the name of its depositor also gives BM&FBOVESPA's clearinghouses full control of deposits, withdrawals, substitutions, transfers and liquidations.

The collateral management systems were developed in house by BM&FBOVESPA, and a dedicated IT team provides support, assuring robustness and flexibility.

Collateral management is the responsibility of a division of the Risk Management Department.

PRINCIPLE 6 – MARGIN

PRINCIPLE 6 – MARGIN: A CCP should cover its credit exposures to its participants for all products through an effective margin system that is risk-based and regularly reviewed.

Key Consideration 1 - A CCP should have a margin system that establishes margin levels commensurate with the risks and particular attributes of each product, portfolio, and market it serves.

BM&FBOVESPA uses the term “margin” to mean the collateral required from participants by clearinghouses to cover credit exposure. Thus it refers to both margin requirements and margin calls. Margin does not include other components of daily settlement obligations, such as daily settlement prices, settlement prices for OTC derivatives at maturity or for early settlement (registered in the mode with clearinghouse guarantee), options premiums (in the case of BM&FBOVESPA Clearinghouse) or settlement amounts for foreign-exchange transactions (in the case of the Foreign Exchange Clearinghouse), although all these influence the calculation of margin requirements and margin calls. For both clearinghouses, the confidence level used in this calculation, as defined by the Market Risk Technical Committee, is at least 99.96%.

Given the high confidence level, considering heavy tails, BM&FBOVESPA’s approach to calculate margin is a stress testing approach, based on scenarios for price variations in the primitive risk factors that influence portfolio value. The risk methodology and the parameters used to calculate risk are approved by the Market Risk Technical Committee. Independently, BM&FBOVESPA’s margining systems (the risk model and associated IT systems) are approved by BCB and inspected annually by BCB, internally and externally audited, and periodically reviewed by Internal Controls, Compliance and Corporate Risk Department.

Additional margin may be required by the clearinghouses from any participant at any time for prudential reasons.

Foreign Exchange Clearinghouse

The Foreign Exchange Clearinghouse uses a pre-margin model whereby advance posting of collateral is a necessary condition for acceptance of transactions. Given the payment-versus-payment (PvP) mechanism, margin requirement aims to cover market risk during reversal of a defaulting participant’s position, without netting out different settlement dates (T+0, T+1, T+2). Risk calculation is based on marking to market and position stress tests using severe scenarios for the BRL/USD exchange rate, assuring a confidence level of at least 99.96%.

BM&FBOVESPA Clearinghouse

BM&FBOVESPA Clearinghouse’s margining system is based on the integrated calculation of portfolio risk (positions in the listed and OTC markets plus collateral) at the customer level. Using the CORE methodology, potential credit exposure is estimated as the worst scenario for closeout of all

customer positions in case of default, given a closeout strategy, i.e. the worst financial loss due to the closeout process considering adverse price movements given by scenarios for the variation in each primitive risk factor (interest rates, exchange rates, volatilities, stock prices, stock indices etc). The calculation considers specific position closeout assumptions for each type of contract settled via the clearinghouse and each type of asset accepted as collateral by the clearinghouse, such as assumptions regarding risk horizons (closeout period), settlement cycles, cash flow structures (daily settlement price vs. settlement at maturity) and liquidity levels. The estimated time to close out the portfolio and extensions to position risk horizons are defined on the basis of the contract's daily liquidity. To assure consistency in selecting the worst closeout scenario, positions and collateral are valued jointly for each scenario.

The clearinghouse also requires extra collateral for positions that exceed the concentration limits for open positions, and may require intermediaries and clearing members to post collateral on an intraday basis if justified by its monitoring of intraday risk (see under Key Consideration 3).

The customer's margin call calculated at the end of the day (T+0) must be covered by collateral posted in cash or assets not later than 1:00 p.m. on the next day (T+1). Any portion of a margin call not covered by the deadline must be covered by the clearing member during the cash settlement window, in which case it is debited to the clearing member's multilateral net balance for same-day settlement (2:10-2:50 pm: window for debtor clearing members to pay the clearinghouse; 2:50-3:50 pm: window for the clearinghouse to pay creditor clearing members). Collateral posting therefore becomes an obligation to be settled with the clearinghouse in national currency by the clearing member. If the clearing member fails to settle this obligation with the clearinghouse, it is declared an operational defaulter or defaulter, and the procedures established for operational default or default situations are applied. Thus the enforceability of the requirement to meet the deadline for collateral posting is based on the possibility of declaring in default a participant that fails to discharge its collateral posting obligation.

In the event of default, the clearinghouse accesses its safeguard structure and can use the collateral posted by the defaulting participants. If this is not sufficient, the settlement fund and BM&FBOVESPA's cash dedicated to the clearinghouses are used.

Clearinghouse participants have full access to information on margin values and limits. Participants in the Foreign Exchange Clearinghouse, under the pre-margin model, can consult the values of the collateral they have posted and required values at all times. In BM&FBOVESPA Clearinghouse, intermediaries and clearing members are informed about margin call every day with enough notice to post the requisite amount by the deadline set. They also have access to the intraday risk tool used by the clearinghouse to monitor customer risk during the day, and to the risk simulator, which enables them to simulate margin requirements and margin calls for any of their customers. In the absence of sharp fluctuations in prices, positions and collateral, the customer's intraday collateral balance (the difference between collateral posted and intraday risk) can be used as an estimate of the customer's margin call for T+1.

The rules of BM&FBOVESPA's clearinghouses establish the responsibilities of participants regarding settlement obligations, including the obligation to deposit margin requirement. The margining

methodologies used by the clearinghouses are documented in detail in the respective risk management manuals, available from BM&FBOVESPA's website (www.bmfbovespa.com.br, Regulation / Regulations and manuals / Post-trade). The parameters for the model are published in files or directly on BM&FBOVESPA's website, enabling participants to use them in their own risk management activities. More details on the margin calculation model are presented under Key Consideration 3.

Key Consideration 2 - *A CCP should have a reliable source of timely price data for its margin system. A CCP should also have procedures and sound valuation models for addressing circumstances in which pricing data are not readily available or reliable.*

The main source of price data for BM&FBOVESPA's clearinghouse margin systems is Risk Management Department's pricing division, which is staffed by a team of specialists and has systems dedicated to providing the prices used in several critical processes, including calculation of margins and settlement amounts. The accuracy and reliability of the prices and financial indicators collected are assured by the use of information obtained from direct sources and liquid markets on the basis of trades actually executed.

BM&FBOVESPA's pricing manual, available only in Portuguese as *Manual de Apreçamento* from its website (www.bmfbovespa.com.br, Serviços, Market Data, Consultas, Mercado de Derivativos, Metodologia), describes the methodologies used to calculate the settlement prices for BM&FBOVESPA's futures contracts. The methodologies draw on primary sources for prices considering the trades and/or orders that meet minimum requirements for validity, as well as alternative sources used if the primary source does not produce valid trades and/or orders.

The pricing manual also states that BM&FBOVESPA, through its Market Risk Technical Committee, may arbitrate settlement prices at its sole discretion if the inputs to the methodologies described in it should be totally or partially unavailable owing to economic or operational events that may compromise price synchronicity or hinder application of the corresponding methodology.

Key Consideration 3 - *A CCP should adopt initial margin models and parameters that are risk-based and generate margin requirements sufficient to cover its potential future exposure to participants in the interval between the last margin collection and the closeout of positions following a participant default. Initial margin should meet an established single-tailed confidence level of at least 99 percent with respect to the estimated distribution of future exposure. For a CCP that calculates margin at the portfolio level, this requirement applies to each portfolio's distribution of future exposure. For a CCP that calculates margin at more-granular levels, such as at the subportfolio level or by product, the requirement must be met for the corresponding distributions of future exposure. The model should (a) use a conservative estimate of the time horizons for the effective hedging or closeout of the particular types of products cleared by the CCP (including in stressed market conditions), (b) have an appropriate method for measuring credit exposure that accounts for relevant product risk factors*

and portfolio effects across products, and (c) to the extent practicable and prudent, limit the need for destabilising, procyclical changes.

The margin models used by BM&FBOVESPA's clearinghouses are risk-based, as noted under Key Consideration 1, with stress testing to estimate the potential future exposure associated with the process of portfolio closeout in the event of participant default.

There is no inherent procyclicality in the model because its parameters (daily liquidity and scenarios for risk factors) are determined ex ante, unconditionally and exogenously to the model by the Market Risk Technical Committee.

BM&FBOVESPA's clearinghouses seek to minimize position closeout risk by defining closeout periods suited to the various types of market and product, and by using stress scenarios compatible with those periods. In the case of BM&FBOVESPA Clearinghouse in particular, the CORE methodology explicitly treats this aspect by taking the maximum daily liquidity of each contract into account when defining the closeout strategy. Thus the presence of positions in contracts with low liquidity may result in a higher margin requirement.

The risk factor variation scenarios are a key element of the margining methodologies. They are based on historical data (since 2002) as well as quantitative and prospective variables. The Market Risk Technical Committee is responsible for defining the policy, parameters and methodology for these scenarios. For each risk factor, the committee sets variation ceilings and floors considered plausible for all risk horizons (1-10 days in the case of BM&FBOVESPA Clearinghouse; 2 days in the case of the Foreign Exchange Clearinghouse); these function as an envelope for factor returns in the horizons mentioned, and no other scenario for the factor exceeds this envelope. Envelopes are defined prospectively based on quantitative models for the available historical returns and forward-looking analysis by specialists in risk, considering a 99.96% confidence level for the distribution of future returns of risk factors individually (one crisis every ten years). This scenario framework substantially mitigates the procyclicality of the margin models used by BM&FBOVESPA's clearinghouses.

Any scenarios and other parameters can be changed without notice, even intradaily.

The margin models are described in detail in the clearinghouses' risk management manuals, which are available from BM&FBOVESPA's website, and their parameters can also be obtained via the website.

BM&FBOVESPA Clearinghouse

BM&FBOVESPA Clearinghouse's margin model is based on the calculation of portfolio risk at the customer level. The measure of risk used by the CORE methodology is the worst cash flow requirement accumulated during the process of closing out the portfolio of a defaulting customer, given adverse price movements defined in the risk factor variation scenarios for the portfolio in question, i.e. for the customer's positions and collateral.

The CORE methodology:

- Considers market, liquidity and cash flow risks, distinguishing them appropriately in the modeling process;
- Represents the portfolio closeout process in detail, evaluating potential losses and gains during the process;
- Offers, in addition to risk measures, the closeout strategy to be followed, i.e. a set of buy and sell instructions for all positions as well as instructions for collateral execution;
- Considers, in determining closeout or settlement, the cash flow structure of each type of contract and collateral and the amount to be closed out in a speedy and orderly manner, i.e. without significant adverse effects on price;
- Assures adequate treatment of potential cash flow mismatches during closeout, comprehensively representing the potential flows of each type of asset and contract and recognising their different cash flow structures;
- Does not commit pricing errors derived from approximation techniques, since it uses the full valuation method to value all positions, including positions in non-linear instruments, under all scenarios.

The main stages of customer margin requirement calculation are as follows:

1. The portfolio closeout strategy is determined;
2. Execution of the closeout strategy is simulated under different scenarios for the risk factors present in the portfolio (10,000 scenarios), calculating for each scenario the daily cash flows accumulated on each of the closeout period as a result of the closeout process;
3. For each simulation/scenario, the worst accumulated daily cash flow is taken;
4. The worst of the worst accumulated daily cash flows, if negative, represents the worst potential loss.

Margin requirement is therefore given not only by the potential loss at the end of the closeout period, but also by any transient losses representing financing requirements during the closeout process.

The risk horizon, or time required to close out a position, is defined as a period of between 1 and 10 days depending on the types of contract in the portfolio: 2 days for equity options, 2-10 days for futures, securities lending positions and equity forwards, 5 days for financial options, and 10 days for OTC derivatives (swaps, flexible options, and non-deliverable forwards). Thus the scenarios for market variations of risk factor prices are defined for risk horizons of 1, 2, 3, ... 10 days and a coherent timeline for each risk factor's price trajectory.

Inclusion of the daily liquidity of each contract or instrument in margin calculation means that the customer portfolio closeout period is a function of the size of its positions. For each position that exceeds the level of daily liquidity of the contract or instrument, the methodology assumes closeout on each day of at most the proportion of the position limited to the level of liquidity. To mitigate the risk of longer position closeout periods and higher price impacts, the clearinghouse sets

concentration limits for open positions, requiring participants with positions that exceed such limits to post extra collateral.

The set of 10,000 scenarios used to evaluate each customer's portfolio comprises historical, quantitative and prospective scenarios, always limited to the envelopes defined by the Market Risk Technical Committee.

- The historical scenarios comprise all mobile risk factor variation windows with sizes of between 1 and 10 consecutive days. The sample used, which ranges from January 2002 to May 2016 and is updated whenever necessary, encompasses multiple periods of stress in more than ten years of data. The historical simulation captures the dependency structure as well as the individual variations observed throughout the sample period.
- The quantitative scenarios are simulated on the basis of quantitative models estimated using historical data with the aim of reproducing stylised events from the financial literature. Risk is broken down into two parts: specific (or idiosyncratic) risk and joint movement risk. Specific risk is modelled independently and on the basis of heavy-tailed distributions (e.g. asymmetric t or GPD). Joint distribution is obtained using statistical techniques relating to concurrent extreme events, such as the grouped t-copula. The quantitative scenarios are obtained via Monte Carlo simulation from the distributions described above. The quantitative approach is capable of producing scenarios that are plausible, given the history, but did not necessarily occur in the period covered by the sample.
- The prospective scenarios are determined by the Market Risk Technical Committee on the basis of a risk analysis that, in addition to the quantitative elements and the history of risk factor returns, considers the following: (i) the evolution of idiosyncratic risk and joint movement risk over time as a result of changes in the fundamentals (of countries and companies) and in the market microstructure; (ii) the lack of a history of returns for new assets and new asset classes; (iii) identification of the plausibility of severe events that have never occurred; and (iv) sudden changes in the domestic or international political and/or economic outlook. Based on this prospective risk analysis, the committee may include additional scenarios for risk factors that plausibly cause breaks in the dependency structure not covered by the sample of historical or quantitative scenarios.

Given the segregation of all positions and collaterals in individual customer accounts, the proprietary portfolio of a clearing member or intermediary represents a particular case of a customer portfolio, and the criteria and parameters used to calculate margin do not differ from those applicable to other customers.

Foreign Exchange Clearinghouse

The value of the collateral required from participants by the pre-margin model is determined by stress testing.

The exposure associated with closeout of a defaulting participant's positions is the result of multiplying the positions to be settled on T+0, T+1 and T+2, marked to market, by the percentage

variation in the exchange rate for 2 days, given by the envelope for this risk factor for BM&FBOVESPA Clearinghouse defined by the Market Risk Technical Committee.

Key Consideration 4 - *A CCP should mark participant positions to market and collect variation margin at least daily to limit the build-up of current exposures. A CCP should have the authority and operational capacity to make intraday margin calls and payments, both scheduled and unscheduled, to participants.*

Every day BM&FBOVESPA's clearinghouses mark to market all positions and collaterals of all customers in the exchange and OTC markets, based on settlement prices and reference prices for T+0 collected by the pricing division of the Risk Management Department.

The clearinghouses use marked-to-market values to update margin requirement, collateral and margin calls, as well as calculating daily settlement values. The Foreign Exchange Clearinghouse calculates amounts in local currency and USD for the daily settlement cycles for T+0, T+1 and T+2. BM&FBOVESPA Clearinghouse calculates amounts in local currency for the daily settlement cycle for T+0, according to its settlement window's timetable. Until settlement, daily settlement values affect the risk assigned to each participant. In each clearinghouse the daily settlement cycle follows the specific timetable for its settlement window.

The possibility of intraday margin calls is an essential part of the process of managing BM&FBOVESPA Clearinghouse's intraday risk, whose function is to assure same-day risk coverage. In this process, BM&FBOVESPA Clearinghouse monitors throughout the day the operating balance (**OB**) of each intermediary (full trading participant or settlement participant), given by the difference between (a) the intraday risk limit (**IRL**) assigned by the Credit Risk Technical Committee plus the collateral (**C**) posted by the intermediary or its clearing member to raise the limit, and (b) the intraday risk associated with the intermediary (**Risk**), i.e. $OB = IRL + C - Risk$. The intermediary's intraday risk has four parts: the risk of unallocated trades, the residual risk associated with allocated customer-collateralized trades, the risk associated with allocated participant-collateralized trades, and the risk associated with the possibility of an additional margin call.

For monitoring purposes, risk is recalculated many times during the day (approximately every 20 minutes) for each customer and each intermediary, incorporating new trades and movements of collateral performed on the day until the moment of calculation. BM&FBOVESPA Clearinghouse does not mark positions or collateral to market intradaily but is capable of doing so if necessary.

The intermediary must keep its operating balance positive ($OB > 0$) throughout the day. If $OB < 0$, the clearinghouse sets a deadline (on the same day) for the intermediary to comply by posting its own collateral, allocating unallocated trades, requiring customers to post intraday collateral, and/or performing risk-mitigating trades. If the intermediary fails to comply by the deadline, the clearinghouse may require the clearing member to post intraday collateral of its own, among other measures.

The clearinghouse has the authority and operational capacity to make and process intraday margin calls and payments. Its rulebooks and manuals contain specific provisions on this possibility. Operationally speaking, the risk management system processes intraday risk calculations and the movements of collateral, so that the intraday margin call process is straightforward.

In the Foreign Exchange Clearinghouse, given the pre-margin model, the risk management system recalculates each participant's risk with every new transaction, and acceptance of transactions is conditional upon the sufficiency of posted collateral and compliance of positions with trading limits.

Key Consideration 5 – *In calculating margin requirements, a CCP may allow offsets or reductions in required margin across products that it clears or between products that it and another CCP clear, if the risk of one product is significantly and reliably correlated with the risk of the other product. Where two or more CCPs are authorised to offer cross-margining, they must have appropriate safeguards and harmonised overall risk-management systems.*

For the purposes of calculating customers' margin requirements, BM&FBOVESPA Clearinghouse allows offsetting of risks across products that it clears, based on the existence of common risk factors in positions in different products and risk factors with proven joint movement. The presence of the same risk factor in positions in different products and assets posted as collateral can give rise to offsets, depending on the signs of the positions and the liquidity of the products and collaterals concerned. Another source of possible risk offsets in the process of calculating customers' margin requirements is joint movement by different risk factors in the portfolio, regardless of the product and collateral from which they derive. The clearinghouse uses scenario modelling to control the selection of risk factors eligible for offsetting by joint movement and the intensity of these offsets.

In the main stages of margin requirement calculation, as described under Key Consideration 3, offsets naturally result from the stage involving simulation of execution of the closeout strategy under different scenarios for the risk factors present in the portfolio (10,000 scenarios), and calculation for each scenario of daily cash flows accumulated on each day of the closeout period.

BM&FBOVESPA's clearinghouses do not participate in cross-margining programs with other CCPs, so there are no offsets or reductions in margin requirement due to positions settled via other clearinghouses, even if they have risk factors in common.

Key Consideration 6 - *A CCP should analyse and monitor its model performance and overall margin coverage by conducting rigorous daily backtesting – and at least monthly, and more-frequent where appropriate, sensitivity analysis. A CCP should regularly conduct an assessment of the theoretical and empirical properties of its margin model for all products it clears. In conducting sensitivity analysis of the model's coverage, a CCP should take into account a wide range of parameters and assumptions that reflect possible market conditions, including the most-volatile periods that have been experienced by the markets it serves and extreme changes in the correlations between prices.*

Backtesting of BM&FBOVESPA's margin methodology has two main components: backtesting of scenarios for risk factor returns, and backtesting of portfolio closeout.

Scenario backtesting evaluates the adequacy of the risk factor variations assumed by the scenarios used to calculate margin, taking the factors individually. The current level of protection is compared to the historical data for factor return. The expected confidence level is at least 99.96%.

Portfolio closeout backtesting evaluates the margin methodology, especially with regard to its risk offsetting and position closeout assumptions. In brief, assuming the event of customer default, portfolio closeout is simulated and the amount of margin required from the customer at the moment of default is compared with the total cost of closeout calculated under current market conditions. Insufficient margin requirement to cover the observed cost of closing out any customer's portfolio is considered a "failure" of the model. Only actual portfolios are analysed in these backtests. This is done on a dynamic basis, corresponding to the closeout of positions during the days following the default (in the case of BM&FBOVESPA Clearinghouse, closeout is simulated in accordance with the closeout strategy defined by the CORE methodology).

The Risk Management Department backtests BM&FBOVESPA Clearinghouse's margin model every day, both for risk factor return scenarios and for all customer portfolios. Breaches evidenced by risk factor scenario backtesting may entail changes to the scenarios, while portfolio closeout cost breaches may also entail changes to other parameters or premises of the model. In the past 12 months, no potential deficiencies of the margin models have been detected as a result of backtesting.

The results of portfolio backtesting are sent to BCB on a daily basis.

The Risk Management Department conducts monthly sensitivity tests of the clearinghouses' margin models. In the case of BM&FBOVESPA Clearinghouse, the analysis focuses on the model's sensitivity to the parameters for liquidity risk, market risk and cash flow risk. In the case of the Foreign Exchange Clearinghouse, sensitivity to market risk is assessed.

Key Consideration 7 - *A CCP should regularly review and validate its margin system.*

As noted under Principle 3, Key Consideration 1, and Principle 4, Key Consideration 5, validation of the risk management models is part of the continuous process of evaluation of BM&FBOVESPA's clearinghouses' risk management structures performed by the Market Risk and Credit Risk Technical Committees. In addition, the model is also submitted to:

- BCB for approval;
- The Risk Analysis Advisory Committee (market participants) for review, whose outcome is reported to Risk Management Department;
- Internal Controls, Compliance and Corporate Risk Department for periodic reviews, whose results are reported to Risk Management Department and BCB;
- Internal and external audits, whose outcomes are reported to the Audit Committee of BM&FBOVESPA's Board of Directors.

PRINCIPLE 7 – LIQUIDITY RISK

PRINCIPLE 7 – LIQUIDITY RISK: *An FMI should effectively measure, monitor, and manage its liquidity risk. An FMI should maintain sufficient liquid resources in all relevant currencies to effect same-day and, where appropriate, intraday and multiday settlement of payment obligations with a high degree of confidence under a wide range of potential stress scenarios that should include, but not be limited to, the default of the participant and its affiliates that would generate the largest aggregate liquidity obligation for the FMI in extreme but plausible market conditions.*

Key Consideration 1 - *An FMI should have a robust framework to manage its liquidity risks from its participants, settlement banks, nostro agents, custodian banks, liquidity providers, and other entities.*

It is important to note the following with regard to the settlement model used by BM&FBOVESPA's clearinghouses:

- There is no such figure as a nostro agent;
- The settlement bank for settlement in local currency is the Central Bank of Brazil;
- Commercial banks are used as settlement banks only for settlement in USD; they are selected by BM&FBOVESPA's Executive Board on the basis of recommendations by the Credit Risk Technical Committee.

CMN Resolution 2882/01, article 3 (V), states that in the Brazilian Payment System (SBP) clearinghouses must “*guarantee, in case of a counterparty default, the timely completion of daily settlements equivalent to the largest single obligation*”.

The liquidity needs of BM&FBOVESPA's clearinghouses in the settlement process when one or more clearing members default consist of funds in local currency and as well as funds in USD. In the case of BM&FBOVESPA Clearinghouse, however, low settlement volumes associated with “2687 investors” (non-resident investors who trade solely in agricultural markets pursuant to CMN Resolution 2687/00) mean that potential liquidity requirements in USD are irrelevant compared with local-currency requirements.

BM&FBOVESPA's liquidity management structure comprises (i) the maintenance of safeguards, (ii) the use of specific criteria for the mitigation of liquidity risk in the event of participant default, in the process of monetising collateral and, in the case of the Foreign Exchange Clearinghouse, in the conversion of local currency into USD and vice-versa, (iii) monitoring of the adequacy of the available liquid resources in the event of default, and (iv) monitoring of external providers of liquidity facilities, clearing members and intermediaries, banks that hold cash collateral, and correspondent banks.

(i) Safeguards and liquidity criteria:

The rulebooks of BM&FBOVESPA's clearinghouses require them to establish risk protection and containment mechanisms, especially liquidity assistance facilities and the right to use posted collateral to cover unsettled debtor balances in a timely manner.

To guarantee the liquidity required to discharge obligations in the stipulated timeframe, the clearinghouses have (a) access to BCB's discount window, via BM&FBOVESPA Bank (this access is important because more than 82% of the collateral posted to the clearinghouses consists of Brazilian government bonds); (b) collateralised and non-collateralised liquidity assistance facilities in local currency and USD (agreements to buy and sell USD), depending on the clearinghouse, provided by top-tier banks in Brazil and abroad under formal bilateral agreements (more information on liquidity assistance facilities can be found under Key Consideration 5); (c) BM&FBOVESPA's cash dedicated to the clearinghouses; (d) assets deposited as contributions to the settlement fund and to constitute minimum non-operating collateral (in the latter case, only in BM&FBOVESPA Clearinghouse); and possibly (e) BM&FBOVESPA's free cash flow.

(ii) In addition, BM&FBOVESPA Clearinghouse sets liquidity-based limits on the acceptance of assets as collateral, consisting of a limit on the acceptance of illiquid collateral, limits on the acceptance of stocks, ADRs, units and ETFs, and a limit for the posting of CDs, LCIs and LCAs with no early redemption clause (see under Principle 5, Key Consideration 1).

- The illiquid collateral acceptance limit is set as a function of the liquid resources available to the clearinghouse for rapid monetisation of such collateral. According to this criterion, the value of each asset posted as collateral by participants or groups of participants is divided into two parts, liquid and illiquid. The liquid portion corresponds to 50% or less of the funds available to the clearinghouse via liquidity assistance facilities collateralised by the asset concerned. The rest is the illiquid portion. Cash collateral in local currency, Brazilian government bonds and bank letters of credit with same-day liquidity are considered wholly liquid regardless of the amount posted as collateral. The sum of the illiquid portions of all the assets posted by a participant must be less than a fraction (50% or less, representing at least two simultaneous defaults) of the funds available to the clearinghouse via other liquidity assistance facilities plus BM&FBOVESPA's cash dedicated to the clearinghouses. Any amount posted above this limit by the participant in the shape of assets subject to the limit for illiquid collateral is ignored by the clearinghouse; the participant must replace them with collateral classified as liquid according to this criterion. The above fractions of liquid resources are a function of the number of simultaneous defaults used as a premise, so that liquidity funds are adequately spread and can be used to treat all defaults.
- The limit for acceptance of each share of stock, ADR, ETF share or unit is set on the basis of asset liquidity for the total amount deposited in the form of the asset in question by the same customer or group of customers.
- The limit for acceptance of CDs, LCIs and LCAs with no early redemption clause limits the posting of collateral by a participant or group of participants in the form of assets that are less liquid for lack of an early redemption clause.

The Foreign Exchange Clearinghouse in turn sets trading limits for its participants as ceilings for their positions on each settlement date (T+0, T+1 and T+2) in order to limit its exposure in the currency conversion process to the amount established in its agreements to buy and sell USD.

(iii) Monitoring of available liquid resources

To monitor the adequacy of the available liquidity, Risk Management Department (a) performs a daily check of the sufficiency of liquid resources available to cover simultaneous defaults by the clearing members with the N largest debtor balances in the day's settlement window, excluding the lines provided by the hypothetically defaulting clearing members (liquidity backtesting) – see under Key Consideration 9; (b) checks participant compliance with the collateral acceptance limits daily, denying the posting of assets or requiring participants to replace assets that violate the limits; and (c) monitors intradaily information on BM&FBOVESPA's cash, the use of liquidity assistance facilities, and the margin calls to be covered in cash during the multilateral settlement window.

(iv) Monitoring of participants, providers of liquidity facilities and other external entities

The Credit Risk Technical Committee periodically assesses participant credit quality, including liquidity aspects. The same applies to the banks that provide liquidity and the banks with which collateral is deposited in local currency and USD. With regard to custodians that hold other collateral posted by participants, it should be stressed that BM&FBOVESPA is the custodian of its clearinghouses' accounts with BM&FBOVESPA Central Depository, CETIP, SELIC, Euroclear, and DTCC (Depository Trust & Clearing Corporation).

BM&FBOVESPA sends BCB a complete report on the existing liquidity assistance facilities each month.

Key Consideration 2 - *An FMI should have effective operational and analytical tools to identify, measure, and monitor its settlement and funding flows on an ongoing and timely basis, including its use of intraday liquidity.*

Through their systems BM&FBOVESPA's clearinghouses calculate settlement obligations, including collateral requirements, for all participants, at all levels (customers, intermediaries and clearing members), and monitor settlement and financial flows in real time.

Financial flows are monitored:

- By the Settlement Department using (i) the "Settlement Pilot" in the case of local-currency settlement flows, via BCB's Reserve Transfer System (STR), and (ii) the "Dollar Pilot" in the case of USD flows, including in both cases the flows deriving from the use of intraday liquidity via BM&FBOVESPA's cash dedicated to the clearinghouses and non-collateralised lines;
- By the Risk Management Department using the collateral management system in the case of financial flows relating to the posting and withdrawal of cash collateral and collateral monetisation;
- Jointly by both departments in the case of flows relating to collateral that involves the STR or correspondent banks abroad, and when they involve the use of collateralised liquidity facilities.

The settlement and dollar pilots, as well as the collateral management system, are used for continuous real-time monitoring and are also available to intermediaries and clearing members to help them with their own activities.

Risk Management Department and Internal Controls, Compliance and Corporate Risk Department also monitor liquidity via intraday reports containing information on the availability of the systems operated by the banks that provide liquidity, the amounts available from liquidity assistance facilities, the expected volume of margin calls to be covered in cash by clearing members in the multilateral settlement window, the results of liquidity testing, and the values of the various components of BM&FBOVESPA's total resources.

The deployment of liquid resources depends largely on the analysis of the default event that creates the need for liquidity.

Key Consideration 3 - *A payment system or SSS, including one employing a DNS mechanism, should maintain sufficient liquid resources in all relevant currencies to effect same-day settlement, and where appropriate intraday or multiday settlement, of payment obligations with a high degree of confidence under a wide range of potential stress scenarios that should include, but not be limited to, the default of the participant and its affiliates that would generate the largest aggregate payment obligation in extreme but plausible market conditions.*

See under Key Consideration 4.

Key Consideration 4 - *A CCP should maintain sufficient liquid resources in all relevant currencies to settle securities-related payments, make required variation margin payments, and meet other payment obligations on time with a high degree of confidence under a wide range of potential stress scenarios that should include, but not be limited to, the default of the participant and its affiliates that would generate the largest aggregate payment obligation to the CCP in extreme but plausible market conditions. In addition, a CCP that is involved in activities with a more-complex risk profile or that is systemically important in multiple jurisdictions should consider maintaining additional liquidity resources sufficient to cover a wider range of potential stress scenarios that should include, but not be limited to, the default of the two participants and their affiliates that would generate the largest aggregate payment obligation to the CCP in extreme but plausible market conditions.*

As noted under Key Consideration 1, the liquid resources available to the clearinghouses, in the currencies pertinent to each one, to assure the fulfillment of their payment obligations within the timeframe established for the daily settlement windows (as required by CMN Resolution 2882) are sufficient to cover at least (i) default by the two clearing members that owe the largest settlement amounts in BM&FBOVESPA Clearinghouse (Cover 2); and (ii) default by the clearing member that owes the largest settlement amount in the Foreign Exchange Clearinghouse (Cover 1).

The adequacy of the liquid resources to the requirements of BM&FBOVESPA's clearinghouses is verified daily using a liquidity stress test (see under Key Consideration 9). In this context, liquid resources means the funds provided by liquidity assistance facilities from banks and BM&FBOVESPA's cash dedicated to the clearinghouses, as well as the use of assets deposited as contributions to the settlement fund and as minimum non-operating collateral (the latter only for BM&FBOVESPA Clearinghouse) and the clearinghouses' indirect access via BM&FBOVESPA Bank to BCB's discount window for rapid monetisation of Brazilian government bonds, an important mechanism for access to liquidity in situations of stress.

Furthermore:

- BM&FBOVESPA's cash dedicated to the clearinghouses is established and periodically reviewed by the Board of Directors on the basis of the Risk and Financial Committee's analysis and recommendations, and must comply with BM&FBOVESPA's Financial Investment Policy, consisting therefore of Brazilian government bonds and funds that invest only in such bonds, with immediate liquidity.
- The limit for acceptance of illiquid collateral in BM&FBOVESPA Clearinghouse is a function of the available liquidity resources (a control that is unnecessary in the Foreign Exchange Clearinghouse which accepts only collateral in local currency, USD and highly liquid Brazilian government bonds).
- The Foreign Exchange Clearinghouse does not allow participants to hold positions exceeding the total amount of liquid resources provided under agreements to buy and sell USD, using trading limits for this purpose.
- The adequacy of the amount of liquid resources available to each of the clearinghouses is monitored daily by Risk Management Department through liquidity backtesting reports showing whether these resources would be sufficient in the event of simultaneous default by clearing members.
- The collateral posted by participants consists mostly (more than 82%) of highly liquid Brazilian government bonds, and margin requirements are calculated at the customer level using methodologies based on stress testing and with a confidence level of at least 99.96%.

Internal Controls, Compliance and Corporate Risk Department performs an independent monthly assessment of liquidity risk, which it reports to the Board of Directors' Risk and Financial Committee and the Chief Financial Officer to help manage the investment of BM&FBOVESPA's own funds.

Given the controls implemented by BM&FBOVESPA, including the allocation and sizing of its cash dedicated to the clearinghouses, and in accordance with the independent assessment performed by Internal Controls, Compliance and Corporate Risk Department, the stress tests show that there is no liquidity deficit.

Key Consideration 5 - *For the purpose of meeting its minimum liquid resource requirement, an FMI's qualifying liquid resources in each currency include cash at the central bank of issue and at*

creditworthy commercial banks, committed lines of credit, committed foreign exchange swaps, and committed repos, as well as highly marketable collateral held in custody and investments that are readily available and convertible into cash with prearranged and highly reliable funding arrangements, even in extreme but plausible market conditions. If an FMI has access to routine credit at the central bank of issue, the FMI may count such access as part of the minimum requirement to the extent it has collateral that is eligible for pledging to (or for conducting other appropriate forms of transactions with) the relevant central bank. All such resources should be available when needed.

As noted under Key Consideration 1, the liquid resources available to BM&FBOVESPA's clearinghouses to cover its liquidity requirements consist of:

- Funds obtained via liquidity assistance facilities from top-tier banks;
- Funds obtained via liquidity assistance facilities from BM&FBOVESPA Bank;
- BM&FBOVESPA's cash dedicated to the clearinghouses;
- Assets deposited as contributions to the settlement fund and as minimum non-operating collateral (the latter only for BM&FBOVESPA Clearinghouse);
- BM&FBOVESPA's free cash flow (defined at the sole discretion of BM&FBOVESPA's Board of Directors).

Funds obtained via liquidity assistance facilities from top-tier banks

The liquidity assistance facilities are formalised in bilateral agreements that specify the amount of funding to be supplied by the bank, the assets accepted as collateral and the corresponding haircuts (where applicable), the times at which the bank must make the funds available, repayment periods, and the costs involved.

The commercial banks that supply liquidity (i) are among the ten largest banks in Brazil according to the rank order provided by BCB, (ii) have access to BCB's discount window, (iii) each have some R\$100 billion in cash equivalents, far more than the liquidity to be supplied to BM&FBOVESPA under the aforementioned agreements, and (iv) are rated Aa1 or Aaa by Moody's, AAA or AA+ by Fitch, or AA- by Standard & Poor's (all ratings national scale).

Indirect access to BCB's discount window via BM&FBOVESPA Bank

The liquidity assistance facilities from BM&FBOVESPA Bank provide the clearinghouses with indirect access to BCB's discount window for monetisation of Brazilian government bonds (posted as collateral by participants and BM&FBOVESPA's own Brazilian government bonds). Thus the clearinghouses' liquidity requirements, including in the event of consecutive default by participants, are met as long as there is collateral in the shape of Brazilian government bonds.

BM&FBOVESPA's cash dedicated to the clearinghouses

The availability of cash dedicated to the clearinghouses is assured by BM&FBOVESPA's Financial Investment Policy. The policy's main guidelines are assuring the maintenance of an adequate level of liquidity, preserving capital, and assuring the sustainability of BM&FBOVESPA's business activities.

According to the policy, BM&FBOVESPA's investment of its own funds must comply with allocation limits relating to: (i) the type of asset (100% in Brazilian government bonds, Brazilian government bond repos, and investment funds with same-day redemption that hold in portfolio only such bonds and repos, and have as managers, administrators and custodians only institutions authorised by the policy (basically institutions with high credit ratings)); (ii) the type of return (at least 85% floating rate); and (iii) liquidity (at least 90% with immediate liquidity, i.e. same-day redemption). The CFO is responsible for compliance with the policy and the Board of Directors for approving any changes thereto.

Assets deposited as contributions to the settlement fund and as minimum non-operating collateral

In the case of the Foreign Exchange Clearinghouse, these are Brazilian government bonds deposited by clearing members and by BM&FBOVESPA as contributions to this clearinghouse's settlement fund.

In the case of BM&FBOVESPA Clearinghouse, they are assets deposited in the form of shares in the FILCB (Fundo de Investimento Liquidez Câmara BM&FBOVESPA) as contributions to the settlement fund and minimum non-operating collateral (access requirements). FILCB shares are the only assets accepted for these purposes.

The FILCB is formally constituted as an investment fund, and is administered, managed and custodied by BM&FBOVESPA Bank. It comprises contributions by BM&FBOVESPA and clearing members to the settlement fund, and deposits of minimum non-operating collateral by full trading participants and settlement participants. Its purpose is to provide the clearinghouse with liquidity, which is achieved by means of loans of Brazilian government bonds from the fund to the clearinghouse, upon collateral posting in favor of the fund (such collateral consists of assets settled by the clearinghouse or eligible assets to be accepted from participants). The government bonds borrowed by the clearinghouse are used, via the intermediation of BM&FBOVESPA Bank, in rediscount transactions with BCB, obtaining the necessary liquidity.

BM&FBOVESPA's free cash flow

The portion of BM&FBOVESPA's cash flow not dedicated to specific activities and subject to BM&FBOVESPA's Financial Investment Policy.

Key Consideration 6 - *An FMI may supplement its qualifying liquid resources with other forms of liquid resources. If the FMI does so, then these liquid resources should be in the form of assets that are likely to be saleable or acceptable as collateral for lines of credit, swaps, or repos on an ad hoc basis following a default, even if this cannot be reliably prearranged or guaranteed in extreme market conditions. Even if an FMI does not have access to routine central bank credit, it should still take account of what collateral is typically accepted by the relevant central bank, as such assets may be more likely to be liquid in stressed circumstances. An FMI should not assume the availability of emergency central bank credit as a part of its liquidity plan.*

There are no supplementary liquid resources besides those mentioned under previous Key Considerations. The clearinghouses do not have liquidity supplied by participants via rule-based arrangements.

Key Consideration 7 - *An FMI should obtain a high degree of confidence, through rigorous due diligence, that each provider of its minimum required qualifying liquid resources, whether a participant of the FMI or an external party, has sufficient information to understand and to manage its associated liquidity risks, and that it has the capacity to perform as required under its commitment. Where relevant to assessing a liquidity provider's performance reliability with respect to a particular currency, a liquidity provider's potential access to credit from the central bank of issue may be taken into account. An FMI should regularly test its procedures for accessing its liquid resources at a liquidity provider.*

The providers of liquidity to BM&FBOVESPA's clearinghouses are:

- BCB, via BM&FBOVESPA Bank (local-currency liquidity assistance facilities and FILCB);
- BM&FBOVESPA (cash dedicated to the clearinghouses and free cash flow);
- Commercial banks (local-currency and USD liquidity assistance facilities).

The commercial banks are selected to be liquidity providers among top-tier banks based on their reputation and credit ratings from independent agencies. They are subject to a credit quality review by the Credit Risk Technical Committee, periodically or whenever the committee deems necessary. The committee's review uses an analysis of each bank's financial health produced by the credit risk division of the Risk Management Department. This analysis takes into account, among other things, data from financial statements (liquidity, loans, asset quality, leverage, delinquencies, earnings) obtained from disclosures to BM&FBOVESPA with the same level of detail as disclosures to BCB ("level 8", higher than disclosures to the market); market indicators, if available (bond yields, price to book, price to earnings, market cap, CDS spreads); and information disclosed by rating agencies. It also appraises each bank's business model and strategy, management expertise and experience, and information about its parent if it is a subsidiary of a foreign bank.

The Risk Management Department and Settlement Department work with the banks that supply liquidity facilities to perform monthly tests to assure timely use of the facilities (checking the right staff will be contacted at each bank, for example, and that they are cognizant of the procedures and know how to implement them, as well as making sure the timing specified in the agreement, if any, will be complied with). The tests are conducted in rotation by different professionals in BM&FBOVESPA's collateral management and settlement teams so that all staff are prepared to carry out the requisite operational procedures in the event of an actual need to use the liquidity facilities. The results are reported to the Market Risk Technical Committee.

The institutions that supply liquidity to BM&FBOVESPA's clearinghouses are fully cognizant of BM&FBOVESPA's business activities: BCB is a regulator and the commercial banks are clearinghouse participants.

Key Consideration 8 - *An FMI with access to central bank accounts, payment services, or securities services should use these services, where practical, to enhance its management of liquidity risk.*

In accordance with the applicable legal framework in Brazil, only financial institutions such as banks but not clearinghouses have full access to BCB's services:

- BM&FBOVESPA's clearinghouses have direct access to BCB with regard to their settlement accounts, which receive payments in local currency (BRL) made by debtor clearing members and perform transfers in local currency from the clearinghouses to creditor clearing members. Such transfers are effected in bank reserves via the Reserve Transfer System (STR) operated by BCB.
- With regard to liquidity risk management in the collateral monetisation process, BM&FBOVESPA's clearinghouses have:
 - indirect access to BCB's discount window via BM&FBOVESPA Bank for monetisation of Brazilian government bonds;
 - a liquidity provision mechanism via lending of government bonds from the Fundo de Investimento Liquidez Câmara BM&FBOVESPA (FILCB);
 - direct access to BCB/SELIC, with their own custody accounts to hold the Brazilian government bonds posted as collateral; transfer of these depends exclusively on instructions from the clearinghouses, with no need for third-party involvement.

With regard to settlement in USD, BM&FBOVESPA does not have direct access to the Federal Reserve's settlement system. Settlement in USD is processed via commercial banks located in New York, which have access to the Fed's discount window. Use of the Fed's services to process settlement in USD is not feasible owing to the difficulty of implementing this model, especially in light of the economic and financial prerequisites applicable in the United States.

Key Consideration 9 - *An FMI should determine the amount and regularly test the sufficiency of its liquid resources through rigorous stress testing. An FMI should have clear procedures to report the results of its stress tests to appropriate decision makers at the FMI and to use these results to evaluate the adequacy of and adjust its liquidity risk-management framework. In conducting stress testing, an FMI should consider a wide range of relevant scenarios. Scenarios should include relevant peak historic price volatilities, shifts in other market factors such as price determinants and yield curves, multiple defaults over various time horizons, simultaneous pressures in funding and asset markets, and a spectrum of forward-looking stress scenarios in a variety of extreme but plausible market conditions. Scenarios should also take into account the design and operation of the FMI, include all entities that might pose material liquidity risks to the FMI (such as settlement banks, nostro agents, custodian banks, liquidity providers, and linked FMIs), and where appropriate, cover a multiday period. In all cases, an FMI should document its supporting rationale for, and should have*

appropriate governance arrangements relating to the amount and form of total liquid resources it maintains.

Margin requirement at the final customer level is calculated daily using a stress testing methodology. In the case of BM&FBOVESPA Clearinghouse, collateral and positions are treated together for the purposes of calculating customer margin requirements, and shocks are applied to collateral using the same scenarios (for variations in primitive risk factors) as those used to evaluate positions. In addition, the collateral posted by each participant is subject to limits based on the volume of liquid resources available. Liquidity risk is therefore supported by the clearinghouses and participants (via the collateral they post).

The daily analysis of the sufficiency of liquidity resources performed by the Risk Management Department is also based on stress testing with scenarios for simultaneous defaults. The same applies to the monthly analysis performed by the Internal Controls, Compliance and Corporate Risk Department.

Liquidity stress test

The liquidity stress test performed by Risk Management Department uses six scenarios, described in detail below. For each of these scenarios the test measures the largest liquidity requirement deriving from simultaneous default by two debtor clearing members and reduced by use of the liquidity resources available to the clearinghouse. After evaluation of the six scenarios, the largest remaining liquidity requirement is selected. The liquidity resources available to the clearinghouse are considered sufficient if there is no remaining liquidity requirement after their use. The liquidity resources available to the clearinghouse are as follows:

- Non-collateralised liquidity facilities provided by top-tier Brazilian banks; facilities provided by the clearing members assumed to be in default under the liquidity stress scenario concerned are not considered.
- Collateral posted by the customers involved in the settlement failure; the test conservatively ignores surplus collateral and considers only highly liquid assets posted as collateral (cash in local currency, and Brazilian government bonds convertible into cash almost instantly via access to the BCB's discount window through BM&FBOVESPA Bank – regular access tests indicate monetisation in 5 minutes).
- The Foreign Exchange Clearinghouse's settlement fund, which consists entirely of Brazilian government bonds; BM&FBOVESPA's contribution to the fund represents approximately 50% of the total (this contribution must be at least equal to the total required from clearing members, as established in the clearinghouse's rulebook).
- BM&FBOVESPA Clearinghouse's settlement fund, which consists entirely of FILCB shares deposited by BM&FBOVESPA and clearing members. FILCB shares are the only asset eligible to be deposited for this purpose in BM&FBOVESPA Clearinghouse's safeguard structure. BM&FBOVESPA's contribution is fixed and equivalent to R\$600 million. Clearing members each

contribute between R\$2 million and R\$15 million according to their individual risk band, pursuant to BM&FBOVESPA Access Manual.

- Minimum non-operating collateral (BM&FBOVESPA Clearinghouse), consisting entirely of FILCB shares deposited by full trading participants and settlement participants. FILCB shares are the only asset eligible to be deposited for this purpose in BM&FBOVESPA Clearinghouse's safeguard structure. BM&FBOVESPA's contribution is fixed and equivalent to R\$600 million. Full trading participants and settlement participants each contribute between R\$2 million and R\$15 million according to their individual risk band, pursuant to BM&FBOVESPA Access Manual.
- BM&FBOVESPA's cash dedicated to the clearinghouses, consisting of Brazilian government bonds.

Scenarios

The liquidity stress test is performed on the morning of the same-day settlement cycle. The scenarios assume default by two clearing members and vary in two dimensions – settlement cycle and use of customer collateral, as described below.

1. Settlement cycle

Each scenario evaluates a specific settlement cycle:

- Cash settlement of real obligations due on T+0
- Cash settlement of simulated obligations due on T+1
- Cash settlement of simulated obligations due on T+2

Financial obligations of customers, intermediaries and clearing members are considered; obligations due on T+1 and T+2 are simulated using the CORE methodology.

2. Rule for selecting customers whose collateral is used by BM&FBOVESPA Clearinghouse

BM&FBOVESPA's Clearinghouse establishes the following rule for selecting customers whose collateral can be used by the clearinghouse:

- A. If the defaulting clearing member identifies defaulting customers, only these customers' collateral may be used.
- B. If the defaulting clearing member does not identify defaulting customers, the collateral of all debtor customers under the clearing member can be used up to the limit of their respective obligations.

The following table summarises the six scenarios.

Scenario	Settlement date	Financial obligation to clearinghouse	Rule for selecting customers
1	T+0	Actual	A
2	T+0	Actual	B
3	T+1	Simulated via CORE	A
4	T+1	Simulated via CORE	B
5	T+2	Simulated via CORE	A
6	T+2	Simulated via CORE	B

Simulation of future cash settlement using CORE methodology

The CORE methodology (used to calculate customer margin requirement) considers multiple risk horizons, from 1 to 10 days, and calculates margin requirement as the worst accumulated cash flow resulting from position and collateral closeout, evaluated from the first to the tenth risk horizon, assuming the closeout process occurs in an orderly manner (the methodology set a ceiling on the positions and collateral that can be settled daily without affecting market prices). Thus margin requirement considers (i) market risk, (ii) liquidity risk, and (iii) cash flow risk.

Because transactions to close out positions and collateral are considered on a daily basis in the closeout horizon, the CORE methodology uses ten-day price trajectories for risk factors called market risk scenarios and defined in terms of three different but complementary generation strategies: (i) historical simulation, (ii) simulation using quantitative models, and (iii) a choice of prospective scenarios. The CORE methodology measures the liquidity of customer positions and collateral during the closeout process, so it runs the liquidity stress test on every customer.

All analyses take into account the clearinghouses' settlement structures (deferred net settlement, T+1 settlement for derivatives, T+0, T+1 or T+2 for FX transactions, T+3 for equities, settlement windows, rules for investment and return of cash collateral, collateral execution procedures). In the case of BM&FBOVESPA Clearinghouse, for example, payments by debtor clearing members to the clearinghouse must occur between 2:10 pm and 2:50 pm, and payment by the clearinghouse to creditor clearing members must occur between 2:50 pm and 3:50 pm – the clearinghouse must obtain the necessary funds in this 60-minute period even in the event of default by a debtor clearing member. With regard to collateral return, surplus collateral is returned on request by the participant and in the same asset type. Thus only cash collateral is returned in cash: cash collateral corresponded on August 28, 2017, to about 0.64% (R\$1.67 billion) of the total collateral posted to BM&FBOVESPA Clearinghouse and 2.35% (R\$158 million) of the total posted to the Foreign Exchange Clearinghouse. BM&FBOVESPA can invest cash collateral, provided this is done in compliance with the restrictions established in the Financial Investment Policy (basically the same as those applicable to the investment of BM&FBOVESPA's own funds).

The sizing of BM&FBOVESPA's cash earmarked to the clearinghouses, also the basis for evaluating the sufficiency of the collateral posted by participants, including the settlement funds, is also derived from stress testing, with (i) risk factor variation scenarios that are more severe than those used to calculate margin requirement, and (ii) multiple default scenarios. All decisions on the subject are duly recorded and supporting documents archived.

The amounts and forms of the liquidity assistance agreements are defined by the Executive Board, after taking recommendations from the Market Risk and Credit Risk Technical Committees. The results of the test to trigger and use liquidity facilities are reported to these committees.

Finally, as noted under Principle 3, validation of the clearinghouses' risk management model is part of a continuous process of evaluation by the Market Risk and Credit Risk Technical Committees, and the model is subject to authorisation by BCB, review by the Risk Analysis Advisory Committee, and periodic review by Internal Controls, Compliance and Corporate Risk Department and external auditors.

Key Consideration 10 - *An FMI should establish explicit rules and procedures that enable the FMI to effect same-day and, where appropriate, intraday and multiday settlement of payment obligations on time following any individual or combined default among its participants. These rules and procedures should address unforeseen and potentially uncovered liquidity shortfalls and should aim to avoid unwinding, revoking, or delaying the same-day settlement of payment obligations. These rules and procedures should also indicate the FMI's process to replenish any liquidity resources it may employ during a stress event, so that it can continue to operate in a safe and sound manner.*

CMN Resolution 2882/01 and BCB Circular 3057/01 establish the clearinghouses' obligations in the event of participant default, including the creation of adequate mechanisms and safeguards to assure the settlement of transactions, such as contracting for liquidity assistance facilities.

The clearinghouse rulebooks state that BM&FBOVESPA is required to establish risk protection and containment mechanisms, especially liquidity assistance facilities, and that it is entitled to use posted collateral to cover debtor balances in a timely manner.

The clearinghouses have fully documented procedures for the use of collateral and liquidity assistance facilities, including the return of funds obtained by such means, which must occur as quickly as possible.

- In the case of non-collateralised facilities and BM&FBOVESPA's cash dedicated to the clearinghouses, funds are returned by executing or monetising the collateral posted by the defaulting participant.
- In the case of collateralised liquidity assistance facilities (Brazilian government bond repos), resources can be returned in cash (if the default was operational and the defaulting participant effected late payment) or as the same collateral (i.e. the collateral posted by the defaulting participant).

- In the case of use of the FILCB (BM&FBOVESPA Clearinghouse), funds can be returned to the FILCB in the form of the borrowed government bonds or by executing the collateral given to the FILCB when the lending transaction was performed (assets settled by the clearinghouse or accepted by it as collateral).

Once the above measures have been completed by the clearinghouse, the resources available to it return to the original amounts.

In the case of contracts to buy and sell USD (Foreign Exchange Clearinghouse), the clearinghouse must deliver BRL or USD to complete the transaction and uses the defaulting participant's rights and collateral for this purpose. Currency delivered to the clearinghouse as part of a transaction to buy or sell USD is not refunded.

PRINCIPLE 8 – SETTLEMENT FINALITY

PRINCIPLE 8 – SETTLEMENT FINALITY: *An FMI should provide clear and certain final settlement, at a minimum by the end of the value date. Where necessary or preferable, an FMI should provide final settlement intraday or in real time.*

Key Consideration 1 - *An FMI's rules and procedures should clearly define the point at which settlement is final.*

The rulebooks of BM&FBOVESPA's clearinghouses explicitly state that settlement of a payment, transfer instruction or other obligation is irrevocable and unconditional when processed by the clearinghouse concerned. See article 12 of BM&FBOVESPA Clearinghouse's rulebook and article 19 of the Foreign Exchange Clearinghouse's rulebook.

Brazil is the most relevant jurisdiction for the settlement activities conducted by BM&FBOVESPA's clearinghouses. The applicable legal and regulatory framework is embodied above all in Law 10214/01, CMN Resolution 2882/01 and BCB Circular 3057/01.

- Article 11 of the rules annexed to BCB Circular 3057/01 states that in systemically important systems (such as BM&FBOVESPA's clearinghouses), cash settlement of the net obligations resulting from accepted transactions must occur directly in BCB.
- CMN Resolution 2882/01, article 3, establishes rules for the payment system of which BM&FBOVESPA's clearinghouses are part, particularly the irrevocable and unconditional settlement of obligations in an account held at BCB, and requires delivery of the traded asset and completion of the corresponding payment to be mutually conditioned.
- Law 10214/01, article 4, states that with regard to clearing members, clearinghouses recognise the full discharge of obligations when they receive BCB's confirmation that the corresponding settlement accounts have been credited with the requisite amounts.

Settlement in local currency between BM&FBOVESPA's clearinghouses and clearing members takes place via BCB's Reserve Transfer System (STR), which is the LVPS in Brazil relevant for BM&FBOVESPA's clearinghouses. According to the STR's rules (attached to BCB Circular 3100/02), settlement of an order to transfer funds is irrevocable and unconditional once performed. An order to transfer funds is considered settled at the moment when the balances in the accounts involved are altered in BCB's records to reflect the transfer.

Key Consideration 2 - *An FMI should complete final settlement no later than the end of the value date, and preferably intraday or in real time, to reduce settlement risk. An LVPS or SSS should consider adopting RTGS or multiple-batch processing during the settlement day.*

BM&FBOVESPA's clearinghouses are structured to complete final settlement on the value date, as required by CMN Resolution 2822/01, article 3 (III) ("the settlement of obligations, which are

irrevocable and unconditional, in an account held at the Central Bank of Brazil, must occur the earliest possible, at the scheduled day”).

Besides the fixed-income transactions that can be performed for same-day settlement via BM&FBOVESPA Clearinghouse, the Foreign Exchange Clearinghouse provides intraday settlement, for transactions registered for same-day settlement, processing only one settlement batch each day. See Foreign Exchange Clearinghouse Rulebook, Chapter VIII, *Settlement*, section II, *Settlement Sessions*; and Foreign Exchange Clearinghouse Operating Procedures Manual, Chapter 14, *Foreign Exchange Transaction Settlement*.

BM&FBOVESPA’s clearinghouses have never experienced deferral of final settlement not provided for in their rules.

Key Consideration 3 - *An FMI should clearly define the point after which unsettled payments, transfer instructions, or other obligations may not be revoked by a participant.*

There is no possibility for participants to cancel or revoke instructions or obligations accepted for settlement by BM&FBOVESPA’s clearinghouses, as evidenced by their rules and other normative documents.

Furthermore, according to the clearinghouse rules, failure to effect a payment determined by a clearinghouse characterises default by the participant concerned.

PRINCIPLE 9 – MONEY SETTLEMENTS

PRINCIPLE 9 – MONEY SETTLEMENTS: *An FMI should conduct its money settlements in central bank money where practical and available. If central bank money is not used, an FMI should minimise and strictly control the credit and liquidity risk arising from the use of commercial bank money.*

Key Consideration 1 - *An FMI should conduct its money settlements in central bank money, where practical and available, to avoid credit and liquidity risks.*

Settlement in local currency

BCB considers BM&FBOVESPA's clearinghouses systemically important. As a result, according to BCB Circular 3057/01, money settlement of the net balance of transactions accepted by the clearinghouses must be effected directly in BCB.

Transfers of funds in local currency (BRL) between clearing members and BM&FBOVESPA's clearinghouses for the settlement of obligations are therefore made in bank reserves via the Reserve Transfer System (STR) operated by BCB.

Settlement via a "special settlement account" (CEL) is also offered by BM&FBOVESPA Clearinghouse to investors accredited for the purpose, as an alternative to multilateral settlement via clearing members. In this settlement method, the customer's obligations and rights are settled via the account held in the customer's name with BM&FBOVESPA Bank, without the participation of the brokerage house or clearing member responsible for the customer: if the customer is a debtor, the customer transfers funds to this account; if the customer is a creditor, the customer receives funds in this account from BM&FBOVESPA Bank. Settlement via a CEL account also takes the form of transfers of bank reserves via the STR: (i) funds received from customers by BM&FBOVESPA Bank are transferred by the latter to the clearinghouse via the STR, and (ii) funds owed to investors are transferred to BM&FBOVESPA Bank via the STR. The timeline for settlement via CEL is contained in the window for multilateral settlement by clearing members (via the STR), so that in the event of CEL settlement failure the obligations of the customer concerned are transferred to the responsible clearing member and brokerage house.

Settlement in US dollars

Settlement in USD performed by BM&FBOVESPA Clearinghouse and the Foreign Exchange Clearinghouse is not made in bank reserves via the Federal Reserve because this would not be feasible, owing mainly to the difficulty of complying with the economic and financial requirements applicable in the United States.

Key Consideration 2 - *If central bank money is not used, an FMI should conduct its money settlements using a settlement asset with little or no credit or liquidity risk.*

For settlement in USD, BM&FBOVESPA's clearinghouses use commercial banks located in New York, named as "correspondent banks" (Citibank in the case of BM&FBOVESPA Clearinghouse; Bank of America Merrill Lynch, Citibank, JP Morgan Chase and Standard Chartered in the case of the Foreign Exchange Clearinghouse).

It should be noted that at the end of each day no balances remain in the clearinghouses' accounts with the correspondent banks, since the funds deposited in them by debtor participants are transferred to creditors on the day they are received by the clearinghouse (not later than the end of this payment window – 2:05 pm in the case of the Foreign Exchange Clearinghouse, 3:50 pm in the case of BM&FBOVESPA Clearinghouse).

Key Consideration 3 - *If an FMI settles in commercial bank money, it should monitor, manage, and limit its credit and liquidity risks arising from the commercial settlement banks. In particular, an FMI should establish and monitor adherence to strict criteria for its settlement banks that take account of, among other things, their regulation and supervision, creditworthiness, capitalisation, access to liquidity, and operational reliability. An FMI should also monitor and manage the concentration of credit and liquidity exposures to its commercial settlement banks.*

The Foreign Exchange Clearinghouse and BM&FBOVESPA Clearinghouse's "2687 customers" (see under Principle 1, Key Consideration 1) use commercial banks for settlement. These institutions are top-tier banks selected by BM&FBOVESPA's Executive Board on the basis of recommendations by the Credit Risk Technical Committee.

This committee evaluates the institutions regularly. Its analysis is based on reputation, balance sheet, credit ratings awarded by independent agencies, credit risk implicit in debt securities issued and credit derivatives, stock price, and operational efficiency.

BM&FBOVESPA currently does not directly impose on its clearinghouses' correspondent banks any restrictions designed to limit the risks deriving from these banks' participation in the settlement process, although it can do so at any time and at its sole discretion. However, the Foreign Exchange Clearinghouse does set buy and sell limits for each participant, which indirectly limit the risks deriving from the involvement of commercial banks in the settlement process.

As noted above, at the end of each day no balances remain in the clearinghouses' accounts with the correspondent banks.

Key Consideration 4 - *If an FMI conducts money settlements on its own books, it should minimise and strictly control its credit and liquidity risks.*

BM&FBOVESPA's clearinghouses do not conduct money settlement on their own books.

Key Consideration 5 - *An FMI's legal agreements with any settlement banks should state clearly when transfers on the books of individual settlement banks are expected to occur, that transfers are to be final when effected, and that funds received should be transferable as soon as possible, at a minimum by the end of the day and ideally intraday, in order to enable the FMI and its participants to manage credit and liquidity risks.*

Transfers of USD between BM&FBOVESPA's correspondent banks and those of its participants are performed via Fedwire, so that transfers to BM&FBOVESPA's accounts with its correspondent banks are final and irrevocable when effected, and funds are transferable intraday once received.

PRINCIPLE 10 – PHYSICAL DELIVERIES

PRINCIPLE 10 – PHYSICAL DELIVERIES: *An FMI should clearly state its obligations with respect to the delivery of physical instruments or commodities and should identify, monitor, and manage the risks associated with such physical deliveries.*

Key Consideration 1 - *An FMI's rules should clearly state its obligations with respect to the delivery of physical instruments or commodities.*

BM&FBOVESPA Clearinghouse conducts settlement by physical delivery only for coffee futures, anhydrous fuel ethanol futures, spot gold, and gold derivatives. Its obligations and responsibilities with respect to settlement by physical delivery are set out in the specifications of these contracts, and in the Rulebook, Operating Procedures Manual and Risk Management Manual.

Key Consideration 2 - *An FMI should identify, monitor, and manage the risks and costs associated with the storage and delivery of physical instruments or commodities.*

Commodities to be physically delivered under the aegis of BM&FBOVESPA Clearinghouse must be stored/deposited with warehouses or other depository institutions accredited by BM&FBOVESPA. Accreditation entails compliance with a set of financial, legal and tax requirements, as well as the obligation to acquire insurance, and requirements regarding storage conditions. The requirements and obligations are stipulated in BM&FBOVESPA's Access Manual. Compliance with them is monitored by BM&FBOVESPA's Central Registration Department, and also by BSM in the case of gold depositories.

The procedures, processes and controls adopted by the clearinghouse to identify, monitor and manage the risks and costs associated with the storage, deposit and delivery of commodities include accrediting depository institutions and verifying compliance with the requirements mentioned above. From time to time depository institutions send BM&FBOVESPA updated information on financial and insurance matters.

Intermediaries and clearing members are subject to audits that verify whether their systems and resources are capable of assuring compliance with the requirements and obligations relating to physical delivery.

BM&FBOVESPA's Services and Classification division is responsible for inspecting depositories and checking storage and deposit conditions. In the case of the products that BM&FBOVESPA is responsible for classifying, routine inspections of depository establishments and classified lots are performed by the above division. For other products, the quality and quantity of warehoused lots are tested, classified and certified by a Grading Supervisor entity (accredited by BM&FBOVESPA), and this entity issues a classification report.

In other words, the risk identified by BM&FBOVESPA is that an unforeseen event could prevent physical delivery or affect the contractual characteristics of the commodity to be delivered. This risk

is small and mitigated by the mandatory purchase of insurance cover by the depository establishment (an insurance policy is one of the documents required by BM&FBOVESPA for the process of admitting depository establishments). Among other reasons for the risk being small is that the volume settled by physical delivery in BM&FBOVESPA Clearinghouse is extremely small. In second-half 2016, for example, the largest volume settled by physical delivery corresponded to only 0.04% of the total financial volume settled by the clearinghouse.

The rules and procedures for delivery are set out in BM&FBOVESPA Clearinghouse's Rulebook, Operating Procedures Manual and Risk Management Manual. BM&FBOVESPA Clearinghouse's system, also accessible to participants, controls all stages of the physical delivery process, including registration of intent to effect physical delivery, specification of the commodity to be delivered, choice of commodity by buyers, maintenance of billing information, and calculation of settlement amounts. When there are no buyers interested in receiving the full quantity specified for delivery by sellers, BM&FBOVESPA Clearinghouse matches sellers and buyers for delivery and receipt respectively, in accordance with the chronological order of positions (oldest first).

PRINCIPLE 11 – CENTRAL SECURITIES DEPOSITORIES

PRINCIPLE 11 – CENTRAL SECURITIES DEPOSITORIES: *A CSD should have appropriate rules and procedures to help ensure the integrity of securities issues and minimise and manage the risks associated with the safekeeping and transfer of securities. A CSD should maintain securities in an immobilised or dematerialised form for their transfer by book entry.*

Key Consideration 1 - *A CSD should have appropriate rules, procedures, and controls, including robust accounting practices, to safeguard the rights of securities issuers and holders, prevent the unauthorised creation or deletion of securities, and conduct periodic and at least daily reconciliation of securities issues it maintains.*

In its activities as a provider of CSD services, BM&FBOVESPA operates in a well-defined regulatory environment with rules and procedures duly approved by BCB and CVM, and has appropriate controls to assure the integrity of the securities (and rights to such securities) deposited with the BM&FBOVESPA Central Depository.

As for the regulatory environment, Law 12810/13, articles 22-31, CVM Instructions 541/13, 542/13 and 543/13, and BCB Circular 3743/15 clearly establish and regulate the activities of CSDs. The following aspects of the regulations in force should be highlighted:

- The definition of a CSD's activities;
- The empowerment of BCB and CVM to regulate and supervise these activities;
- The institutions authorised to operate as CSDs and the authorisation process;
- Establishment of the fiduciary ownership principle in favour of the CSD (whereby the CSD has effective control of the securities deposited with it, acting as fiduciary owner toward the issuer but keeping such securities separate from its own equity);
- Mandatory identification of actual owners (individual customer segregation model);
- The impossibility of negative balances in an investor's deposit account;
- Recognition that records of securities deposited with the CSD in the holder's name represent effective ownership of such securities;
- Recognition of the legal validity of the liens and encumbrances constituted in the CSD environment.

BM&FBOVESPA Central Depository activities are governed by rules and operating procedures approved by BCB and CVM, as well as appropriate processes and controls to assure the integrity of securities (and rights to such securities) deposited with the BM&FBOVESPA Central Depository. The following are especially relevant:

- Control and processing of all balances, transfers and treatments of corporate events in deposit accounts at the level of the individual customer;

- Control of central depository deposits and withdrawals to ensure that the respective credits and debits under BM&FBOVESPA’s fiduciary ownership are concurrent with credits and debits to the deposit accounts concerned so as to avoid the “creation” or “loss” of securities;
- Robust accounting practices that do not permit the existence of negative account balances;
- Procedures performed with issuers, or the registrars appointed by issuers, to reconcile:
 - (i) the central depository accounts kept in the names of the owners (investors) with the account balances held directly on the issuers’ books under BM&FBOVESPA’s fiduciary ownership, thereby assuring the existence and ownership of the securities deposited with the central depository;
 - (ii) the corporate events calculated by BM&FBOVESPA on behalf of the owners with the issuers’ calculations regarding the balances held under BM&FBOVESPA’s fiduciary ownership, thereby assuring the accuracy of accounting records and payment of corporate events;
- Daily notification of issuers regarding the status of positions in the central depository, including owner identification and contact details, enabling issuers to perform reconciliation and access owners whenever necessary (e.g. to convene a shareholder meeting);
- Daily notification of custodians regarding deposit account movements and positions for which they are responsible, in real time and/or by batch processing, enabling custodians to perform reconciliation;
- Notification of investors (owners) regarding positions and account movements via notices and account statements sent directly to investors by email and/or on paper, and via a secure electronic channel accessible around the clock, seven days a week, on BM&FBOVESPA’s website;
- Internal and external auditing to verify processes, risks and internal controls in the central depository environment.

Safeguarding the rights of securities issuers and holders

The records kept by the issuer, or by the registrar appointed by the issuer, are the initial source of a security’s existence. All securities deposited with the central depository must necessarily be transferred in the issuer’s records to the fiduciary ownership of BM&FBOVESPA.

Concurrently with confirmation of the transfer and constitution of fiduciary ownership, the quantities of securities are credited to a deposit account in the owner’s name at BM&FBOVESPA Central Depository, and from this moment on BM&FBOVESPA is responsible for control of the securities.

The securities held by BM&FBOVESPA Central Depository are registered in its deposit accounts directly in the name of the owners. These records given them effective ownership rights to the securities, which are segregated from BM&FBOVESPA’s capital and from the own-account positions of the custodians engaged by the owners.

Relations between the central depository and issuers, or their appointed registrars, are defined in the applicable legislation and in BM&FBOVESPA’s rules and procedures, which establish and preserve

the rights and obligations (i) of the issuer regarding the securities it issues, and (ii) of the central depository in safekeeping the securities.

Account balances, custody movements and treatment of corporate events affecting the securities are governed by rules, procedures and controls designed to assure appropriate accounting and maintenance of positions held on behalf of their owners and to mitigate any risks associated with other services offered to participants by BM&FBOVESPA.

All processes and controls, including reconciliation performed internally and with issuers, are audited annually by BM&FBOVESPA's Auditing Department and independent auditors authorised by CVM. Risk mapping and internal controls are reviewed annually by Internal Controls, Compliance and Corporate Risk Department.

Control of account balances: The balances of securities (and of the corporate events affecting such securities), custody movements (deposits, withdrawals and transfers) and treatment of corporate events are all booked in deposit accounts with complete identification of account owners.

To assure the control, consistency and integrity of account balances, BM&FBOVESPA uses a process of internal reconciliation and a process of verification with issuers. Internal reconciliations are executed in at least seven regular processing windows during the day via automatic procedures to verify the consistency of account balances with registered account movements. The process involving issuers' records verifies the consistency of the balances held by the central depository on behalf of the owners with the balances held directly on the issuer's books under BM&FBOVESPA's fiduciary ownership, assuring the existence of the correct amounts of securities deposited.

Deposits: Account movements triggered by securities deposit instructions are processed by dual command, involving the issuer (or its appointed registrar) and the custodian of the security's owner. Upon dual command, the issuer must transfer ownership of the security registered on its books as owned by the investor concerned to BM&FBOVESPA's fiduciary ownership. Concurrently with this transfer, the amount of the security is credited to the investor's deposit account with the central depository. The controls that are part of this process ensure that crediting the security to BM&FBOVESPA's fiduciary ownership and crediting the same security to the investor's deposit account do not result in duplication or creation of securities, thereby maintaining the ownership rights and integrity of the securities held in the deposit accounts.

Withdrawals: Withdrawal instructions are accepted only if the specified amount of the securities concerned is available in the investor's deposit account, since negative balances are not allowed. The process begins with a request from the investor's custodian, which is copied to the issuer, who transfers fiduciary ownership of the security concerned, registered on its books in BM&FBOVESPA's name, to the beneficial owner. Concurrently with this transfer, and the resulting extinction of fiduciary ownership, the specified amount of the security is debited against the investor's deposit account, with no duplication or deletion of securities, thereby maintaining the investor's ownership rights to the securities directly in the issuer's records.

Custody transfers: Custody transfers may be (i) a response to an instruction to settle a transaction from one of BM&FBOVESPA's clearinghouses, or (ii) a free-of-payment transfer ordered by a

custodian. In both cases, custody transfer instructions are accepted only if the specified amount of the securities concerned is available in the investor's deposit account, since negative balances are not allowed. In the case of free-of-payment transfers (item ii above), if the owner or custodian of the security changes, or if both change, on the next day BM&FBOVESPA notifies the owner of the security by physical mail and/or email, as well as posting the information to its secure internet channel, so that the investor can check whether the debit is consistent with the order sent to the custodian.

Treatment of corporate events: Corporate events are treated at the level of the investor's deposit account. In the case of corporate events in securities, BM&FBOVESPA performs the calculations concerned considering the balance in each deposit account and credits the securities originating in the event directly to the investor's account, thereby preserving the rights associated with the securities deposited. In the case of corporate events in cash, the result of the calculation processed by BM&FBOVESPA, including tax liability, is reconciled with the issuer responsible for payment, or with the issuer's registrar. After reconciliation, BM&FBOVESPA receives the cash and transfers it to the custodian, which credits the funds directly to the investor. Voluntary corporate events create exercise rights to the event directly in the investor's deposit account. BM&FBOVESPA coordinates rights exercise and the respective payments.

Prevention of the unauthorised creation or deletion of securities

As established in the Operating Procedures Manual of BM&FBOVESPA Central Depository, securities are created/credited or deleted/debited against the owner's deposit account only after the issuer confirms (i) that ownership of the securities entered on its books in the owner's name has been transferred to BM&FBOVESPA's fiduciary ownership, in the case of deposits; or (ii) that fiduciary ownership of the securities entered on its books in BM&FBOVESPA's name has been transferred to the beneficial owner, in the case of withdrawals.

These restrictions are configured and controlled in the systems maintained by BM&FBOVESPA Central Depository.

Key Consideration 2 - *A CSD should prohibit overdrafts and debit balances in securities accounts.*

BM&FBOVESPA Central Depository systems do not allow overdrafts or debit balances in the deposit accounts held in the names of securities owners.

Key Consideration 3 - *A CSD should maintain securities in an immobilised or dematerialised form for their transfer by book entry. Where appropriate, a CSD should provide incentives to immobilise or dematerialise securities.*

All securities accepted for deposit are already dematerialised by virtue of the applicable regulations. Thus all the securities held by BM&FBOVESPA Central Depository are dematerialised and no physical certificates are issued.

Key Consideration 4 - *A CSD should protect assets against custody risk through appropriate rules and procedures consistent with its legal framework.*

BM&FBOVESPA has appropriate mechanisms to protect securities and mitigate custody risks associated with the operations of its participants and their internal processes.

The following points should be noted with regard to these protection and custody risk mitigation mechanisms associated with the activities of custodians:

- The individual customer segregation model, which in the event of custodian insolvency permits rapid portability of balances to another custodian, preserving the ownership rights of securities holders;
- The setting of custody limits according to the custodian's financial capacity;
- The use of systems with control rules and automated tools to assist custodians with the management of operational risk and internal control processes;
- The provision of information to custodians, enabling them to perform reconciliation, and directly to securities holders enabling them to control custodians;
- The process of self-regulation executed by BSM, involving risk-based supervision and periodical audits of custodians.

With regard to the risks associated with BM&FBOVESPA Central Depository activities, the protection and mitigation mechanisms include the processes and controls in place to assure the integrity of the securities held deposited and the ownership rights of their owners (as stressed under Key Consideration 1), as well as the annual review of risk mapping and internal controls by the Internal Controls, Compliance and Corporate Risk Department.

Furthermore, the responsibilities of BM&FBOVESPA Central Depository are established in the applicable legislation and in the rules and operating procedures approved by BCB and by CVM, and its CSD activities are subject to supervisory audits by the regulators as well as external and internal auditing to verify compliance with the applicable legislation.

BM&FBOVESPA has an investor compensation mechanism (local acronym MRP) managed by BSM to ensure that investors, and only investors, are compensated for losses resulting from operating errors by participants when intermediating transactions performed on the exchange or providing custody services. Investors can submit claims for compensation within 18 months of the event that caused a loss, and any compensation is limited to R\$120,000 per claim. The MRP can be triggered mainly in the following situations:

- Non-execution or faulty execution of orders
- Inadequate use of cash, securities or other assets, including financing or lending of securities operations
- Delivery to investors of illegitimate or restricted securities or other assets

- Inauthentic endorsement of securities or other assets, or use of an illegitimate power of attorney or other document required for securities transfer
- Business closure

Key Consideration 5 - *A CSD should employ a robust system that ensures segregation between the CSD's own assets and the securities of its participants and segregation among the securities of participants. Where supported by the legal framework, the CSD should also support operationally the segregation of securities belonging to a participant's customers on the participant's books and facilitate the transfer of customer holdings.*

In accordance with the applicable legislation and BM&FBOVESPA Central Depository rules, the securities deposited with the BM&FBOVESPA Central Depository must be registered in deposit accounts directly in the names of the owners. This ensures that the account holders are the legal owners of such securities (and of the rights arising from them). It also assures segregation both from BM&FBOVESPA's equity and from the proprietary positions of the custodian.

Transfers of custody between deposit accounts held under different custodians are allowed and occur in real time. The original custodian must order the transfer of custody between a deposit account under its responsibility and a deposit account under the responsibility of another custodian. Transfers between accounts belonging to the same account holder require a single order of the original custodian, and transfers between accounts belonging to different account holders require confirmation of acceptance (dual command) by the custodian that is receiving the securities and a justification by the transferring custodian (e.g. gift, private sale, corporate succession)

Key Consideration 6 - *A CSD should identify, measure, monitor, and manage its risks from other activities that it may perform; additional tools may be necessary in order to address these risks.*

BM&FBOVESPA is a vertically integrated market infrastructure operator and as such it provides CSD, listing, trading and CCP services, as well as securities lending, OTC derivatives registration, fixed-income securities registration, and information services.

Additionally, BM&FBOVESPA manages Tesouro Direto (Treasury Direct), a program for individual investors to buy and sell federal government debt securities developed by the National Treasury in partnership with BM&FBOVESPA. The system is processed in an integrated environment developed by the National Treasury and operated by BM&FBOVESPA. Besides purchases and sales, BM&FBOVESPA also performs settlement of transactions, together with the corresponding movements of the securities in the Central Bank's Special System for Settlement and Custody (SELIC). BM&FBOVESPA does not act as central counterparty, there is no trading on the exchange market, the investor's counterparty is always the National Treasury, and liquidity is guaranteed by the National Treasury. In this way, and considering BM&FBOVESPA's responsibilities described in

Tesouro Direto's rules, BM&FBOVESPA is not exposed to credit, market or liquidity risks owing to participation in this activity.

All activities, risks and internal controls associated with BM&FBOVESPA Central Depository services, without exception, are mapped, evaluated and monitored by the Internal Controls, Compliance and Corporate Risk Department.

BM&FBOVESPA is not exposed to credit and/or liquidity risks as a provider of CSD services.

PRINCIPLE 12 – EXCHANGE-OF-VALUE SETTLEMENT SYSTEMS

PRINCIPLE 12 – EXCHANGE-OF-VALUE SETTLEMENT SYSTEMS: *If an FMI settles transactions that involve the settlement of two linked obligations (for example, securities or foreign exchange transactions), it should eliminate principal risk by conditioning the final settlement of one obligation upon the final settlement of the other.*

Key Consideration 1 - *An FMI that is an exchange-of-value settlement system should eliminate principal risk by ensuring that the final settlement of one obligation occurs if and only if the final settlement of the linked obligation also occurs, regardless of whether the FMI settles on a gross or net basis and when finality occurs.*

According to CMN Resolution 2882/01, article 3, mutual conditioning of asset delivery and the corresponding payment is a rule of the Brazilian Payment System.

BM&FBOVESPA Clearinghouse adopts the principle of delivery-versus-payment (DvP) to settle transactions in the equity market (stocks, BDRs, subscription bonuses, subscription rights, subscription receipts, mutual fund shares) and fixed-income market, and for contracts involving physical delivery, i.e. coffee and anhydrous fuel ethanol futures, and gold derivatives.

The Foreign Exchange Clearinghouse adopts the principle of payment-versus-payment (PvP) in the settlement of spot foreign-exchange transactions.

The finality of settlement of linked obligations is considered simultaneous, as established in the clearinghouses' rulebooks and manuals.

PRINCIPLE 13 – PARTICIPANT DEFAULT RULES AND PROCEDURES

PRINCIPLE 13 – PARTICIPANT DEFAULT RULES AND PROCEDURES: *An FMI should have effective and clearly defined rules and procedures to manage a participant default. These rules and procedures should be designed to ensure that the FMI can take timely action to contain losses and liquidity pressures and continue to meet its obligations.*

Key Consideration 1 - *An FMI should have default rules and procedures that enable the FMI to continue to meet its obligations in the event of a participant default and that address the replenishment of resources following a default.*

BM&FBOVESPA's clearinghouses have rules and procedures that allow them to take the necessary action if a participant defaults or becomes an operational defaulter to assure the fulfillment of their obligations within the requisite timeframe, in accordance with Law 102014/01, CMN Resolution 2882/01 and BCB Circular 3057/01. These rules and procedures, as well as the definition of the terms "operational defaulter" and "defaulter" as they apply to participants, are clearly and explicitly set out in their rulebooks and risk management manuals.

In BM&FBOVESPA Clearinghouse, participants are declared "operational defaulters" when they fail to discharge their obligations for operational reasons during a certain period of time at BM&FBOVESPA's discretion, and "defaulter" when they fail to discharge their obligations and are not declared, or cease to be, operational defaulters. The rules also state who is empowered to declare participants in such conditions, reflecting the chain of responsibilities (the clearinghouse in the case of clearing members, clearing members in the case of the brokerage houses to which they provide settlement services, and brokerage houses in the case of customers). The clearinghouse must immediately notify BCB when it declares clearing members and brokerage houses operational defaulters or defaulters.

Participants declared operational defaulters or defaulters must identify to the clearinghouse the participants under their responsibility who caused the failure, declaring them operational defaulters or defaulters. This identification is fundamental to identification of the collateral that can be used to address the failure. If it does not occur, the value of the failure is assigned to the debtor participants under the responsibility of the participant declared an operational defaulter or defaulter, in proportion to its multilateral net debit balances. BM&FBOVESPA Clearinghouse segregates positions and collateral at the final customer level, so it has complete information on the multilateral net balances of all participants. The proprietary positions and collateral of brokerage houses and clearing members are treated identically to customers' positions and collateral.

Among the measures that can be taken by the clearinghouse to deal with default by a clearing member (and hence default by one or more brokerage houses and one or more customers, jointly referred to as "defaulting participants"), the following should be stressed: (a) blocking of the collateral posted by the clearing member and participants under its responsibility; (b) use of the defaulting participants' rights and collateral, as well as other collaterals available in the safeguard structure, to discharge the clearinghouse's obligations to other clearing members; (c) a ban on new

transactions by the defaulting participants; (d) blocking of registration functionality for accounts under the responsibility of participants linked to the defaulting clearing member; (e) blocking of access by participants under the defaulting clearing member's responsibility to the trading and transaction registration systems, and reduction of the operational limits applicable to the defaulting clearing members and participants linked to it; (f) closeout at market prices of the positions registered in the names of the defaulting participants; (g) a requirement to post extra collateral; (h) transfer of non-defaulting customers' positions and collateral linked to the defaulting brokerage house and clearing member; and (i) closeout at market prices of the positions held by the customers referred to in item (h), if the transfer of their positions and collateral is not possible or viable according to the clearinghouse. In the case of clearing members declared operational defaulters, the same measures apply, except those relating to position closeout, and position and collateral transfer.

The sequence for use of collateral is as follows: (1) collateral posted by defaulting customers linked to defaulting brokerage houses and clearing members; (2) collateral surplus posted by defaulting customers linked to other brokerage houses and/or other clearing members, with their permission; (3) collateral posted by defaulting brokerage houses linked to defaulting clearing members, including minimum non-operating collateral; (4) collateral posted by defaulting clearing members; (5) contributions by defaulting clearing members to the settlement fund; (6) BM&FBOVESPA's contribution to the settlement fund; (7) other clearing members' contributions to the settlement fund; and (8) BM&FBOVESPA's cash dedicated exclusively to the clearinghouse.

This sequence can be changed in order to mitigate liquidity risk if the clearinghouse deems the collateral concerned to display distinct characteristics in terms of liquidity, but final allocation of losses among participants must follow the original applicable sequence.

See BM&FBOVESPA Clearinghouse Rulebook, Title II – *The Clearinghouse's Operations as Central Counterparty*, Chapter V – *Failure to Discharge Obligations*; Chapter IV – *Risk Management*; BM&FBOVESPA Clearinghouse Risk Management Manual, Chapter 2 – *Procedures for a default or operational defaulter event*.

In the Foreign Exchange Clearinghouse, a participant is declared an "operational defaulter" if it cannot settle an obligation on time for an operational reason, and "defaulter" if it cannot settle an obligation on time owing to lack of payment capacity.

The Foreign Exchange Clearinghouse can take the following measures when participants are declared operational defaulters: (a) a ban on new transactions by such participants; (b) blocking payments or delivery of USD to them; (c) blocking amounts due to them and collateral posted by them (including their contributions to the settlement fund) and use of such amounts and collateral by the clearinghouse to discharge its obligations to other participants; and (d) a requirement to post extra collateral. Operational defaulters are granted more time, albeit still within the clearinghouse's settlement window for creditor participants, to solve the problem. If they fail to do so within the extra time, they are declared in default.

In the case of a declaration of default, (a), (b) and (c) above are applied, the defaulter is excluded as a participant in the clearinghouse, and the clearinghouse settles its transactions due for settlement

on dates later than the default date using the amounts due to the defaulter and the collateral posted by the defaulter. The sequence for collateral use is as follows: (1) collateral posted by the defaulting participant; (2) the defaulting participant's contribution to the settlement fund; (3) BM&FBOVESPA's contribution to the settlement fund; and (4) other participants' contributions to the settlement fund.

See the Foreign Exchange Clearinghouse Rulebook, Chapter VIII – *Settlement*, Chapter IX – *Safeguards*; Foreign Exchange Clearinghouse Risk Management Manual, Chapter 8 – *Operational Defaulters and Defaulters*; Operating Procedures Manual, Chapter 16 – *Treatment of Operational Defaulter Agent*, Chapter 17 – *Treatment of Defaulter Agent*.

To cover their liquidity requirements during the treatment of default or operational default situations, BM&FBOVESPA's clearinghouses can trigger their liquidity assistance agreements with banks or use BM&FBOVESPA's own funds dedicated to them (see under Principle 7, Key Consideration 4). To collateralise the provision of funds via collateralised agreements or return funds obtained via non-collateralised agreements or BM&FBOVESPA's cash dedicated to the clearinghouses, the clearinghouses use the collateral posted by defaulting participants (or operational defaulters) as well as their respective settlement funds.

As established in the clearinghouse rulebooks, the following rules among others apply to the settlement funds:

BM&FBOVESPA Clearinghouse

- BM&FBOVESPA's contribution is R\$600 million (about 50% of the fund).
- If the contributions of non-defaulting participants are used, the sums later injected to replenish the fund must not be used to cover losses due to the same default or previous losses.
- The total value of additional sums required from a participant to replenish the fund in a 20-day period is limited to three times the value of its required individual contribution.
- If required contributions to the fund are increased as a result of a review by BM&FBOVESPA, the additional sums contributed to comply with the new required contributions may not be used to cover losses due to defaults that occurred prior to the announcement of the new contributions.

Foreign Exchange Clearinghouse

- BM&FBOVESPA's contribution must be at least equal to the total of all participants' contributions (thus representing at least 50% of each fund);
- If the contributions of non-defaulting participants are used, the sums with which the settlement fund is replenished may not be used to cover losses due to the default or prior to its occurrence;
- The total value of contributions required from a participant to replenish the fund in any period of 20 business days is limited to three times the value of its individual required contribution;
- If required contributions to the fund are increased as a result of a review by BM&FBOVESPA, the additional sums contributed to comply with the new required contributions may not be used to cover losses due to defaults that occurred prior to the announcement of the new contributions.

Key Consideration 2 - *An FMI should be well prepared to implement its default rules and procedures, including any appropriate discretionary procedures provided for in its rules.*

BM&FBOVESPA's clearinghouses have documented internal procedures that are followed by its departments in the event of participant default. Top management notifies stakeholders about default events in a timely manner by means of circular letters (to participants and the general public), and electronic messages or telephone calls (to the regulators). If discretionary decisions have to be made, BM&FBOVESPA's Executive Board is responsible for doing so.

Internal processes to manage default events are reviewed whenever there are significant changes in clearinghouse operating procedures and/or rules that might affect default management processes. Proposed changes may be submitted to the Executive Board for approval, depending on their content.

Key Consideration 3 - *An FMI should publicly disclose key aspects of its default rules and procedures.*

The rules and procedures of BM&FBOVESPA's clearinghouses relating to participant default are contained in their rulebooks and manuals, which are published on BM&FBOVESPA's website (www.bmfbovespa.com.br, Regulation / Regulations and manuals / Post-trade).

Key Consideration 4 - *An FMI should involve its participants and other stakeholders in the testing and review of the FMI's default procedures, including any close-out procedures. Such testing and review should be conducted at least annually or following material changes to the rules and procedures to ensure that they are practical and effective.*

Because customer default does not change the responsibilities of the brokerage house and its clearing member with regard to the obligations associated with the customer's transactions, which will be settled in accordance with regular procedures and rules, and because all positions and collateral are identified and segregated at the customer level, in the course of their regular daily activities BM&FBOVESPA and its participants carry out the most critical procedures relating to the measures required to deal with participant default, such as position closeout, collateral use, and the transfer to other participants of non-defaulting customers' positions and collateral.

The position closeout and collateral use procedures required to deal with participant default are tested whenever customer default occurs, since in this case the procedures are performed by the brokerage house responsible for the defaulting customer via the clearinghouse's usual regular processes applicable to the brokerage house's day-to-day activities.

The transfer of positions and collateral belonging to non-defaulting customers under the responsibility of a brokerage house declared in default is performed via the clearinghouse's regular

process for transferring positions and collateral registered in the customer account with the originating brokerage house to the customer account with the receiving brokerage house. This process is valid whether or not the originating brokerage house is in default.

As noted under Principle 7, Key Consideration 7, BM&FBOVESPA's clearinghouses perform monthly tests relating to the use of bank liquidity assistance facilities.

PRINCIPLE 14 – SEGREGATION AND PORTABILITY

PRINCIPLE 14 – SEGREGATION AND PORTABILITY: *A CCP should have rules and procedures that enable the segregation and portability of positions of a participant's customers and the collateral provided to the CCP with respect to those positions.*

Key Consideration 1 - *A CCP should, at a minimum, have segregation and portability arrangements that effectively protect a participant's customers' positions and related collateral from the default or insolvency of that participant. If the CCP additionally offers protection of such customer positions and collateral against the concurrent default of the participant and a fellow customer, the CCP should take steps to ensure that such protection is effective.*

The segregation of positions and collateral implemented by BM&FBOVESPA's clearinghouses is organised in accordance with the applicable Brazilian legal framework, especially Law 9613/98 and CVM Instructions 301/99 and 505/13, which require operators of organised securities markets and clearinghouses to identify and monitor the individual customers of transactions; and CVM Instruction 541/13, which stipulates that CSDs must keep securities in individual investors' deposit accounts (including encumbered or pledged assets and assets posted as collateral), each of which must be segregated from all other assets held in deposit accounts and other transactions.

The regulatory framework applicable to resident investors also applies to non-resident investors, in accordance with CMN Resolution 4373/14 and CMN Resolution 2687/00.

The arrangement that guarantees the segregation and protection of positions and collateral is the account structure of BM&FBOVESPA's clearinghouses. This structure reflects the legal requirement mentioned: every transaction is registered in an account that permits the identification of all participants responsible for it up to the final customer level, and the account in which a customer's transactions are booked is also used to control the collateral posted by that same customer. BM&FBOVESPA is therefore able to identify accurately the owner of each position and collateral. In the case of the Foreign Exchange Clearinghouse, the account structure is simpler since there is no chain of participants in the settlement process (a transaction is registered in the name of a clearinghouse participant, which is alone responsible for settlement).

The arrangement to guarantee portability in BM&FBOVESPA Clearinghouse is the specific process for transfer, through which a customer's positions and collateral can be transferred from an account held in its name under a brokerage house and clearing member to an account in its name under a different brokerage house and/or a different clearing member. The transfer is set up and completed via the clearinghouse's systems. Its completion depends on the consent of the clearing member that represents the receiving brokerage house; by consenting, this clearing member assumes responsibility for the positions and collateral transferred. The transfer procedures are defined in the clearinghouse's operating procedures manual (Chapter 6 – *Position Control*). In the case of the Foreign Exchange Clearinghouse, portability is irrelevant since there is no chain of responsibilities between participants.

All BM&FBOVESPA Clearinghouse's rules, procedures, processes and systems are based on identification of the customer and protect the customer's positions and collateral against default by the participants responsible for the customer and default by other customers – see the rules for collateral use and the requirement that a non-defaulting customer's positions and collateral under the responsibility of a defaulting brokerage house/clearing member be transferred to other brokerage houses/clearing members.

With regard to the legal solidity and enforceability of customer position and collateral protection and transfer, Brazil's legal framework, specifically Law 10,2014/01, CMN Resolution 2882/01 and BCB Circular 3057/01, provides a high level of assurance for BM&FBOVESPA's mechanisms relating to position and collateral protection and transfer. BM&FBOVESPA's rules and procedures are developed in accordance with this framework and approved by the competent regulators.

BM&FBOVESPA does not regard any jurisdiction other than Brazil as relevant to the ability of its clearinghouses to segregate or transfer investor positions and collateral. BM&FBOVESPA is not aware of any legal action taken against it in respect of its clearinghouses' rules and procedures governing the protection and transfer of customers' positions and collateral.

Key Consideration 2 - *A CCP should employ an account structure that enables it readily to identify positions of a participant's customers and to segregate related collateral. A CCP should maintain customer positions and collateral in individual customer accounts or in omnibus customer accounts.*

According to the account structure used by BM&FBOVESPA's clearinghouses, customer positions and collateral are registered in individually identified accounts and hence segregated from the positions and collateral of other investors, as described under Key Consideration 1.

The account structure also ensures that brokerage houses' and their clearing members' positions and collateral are registered in individual segregated accounts in the name of each participant.

The account structure used by BM&FBOVESPA's clearinghouses does not include omnibus accounts.

Key Consideration 3 - *A CCP should structure its portability arrangements in a way that makes it highly likely that the positions and collateral of a defaulting participant's customers will be transferred to one or more other participants.*

The individual customer segregation model used by BM&FBOVESPA Clearinghouse, and the rules and procedures governing the treatment of default, ensure that all customer positions and collateral are controlled by the clearinghouse, guaranteeing effective transfer. In the event of default the clearinghouse's interest in fully effective transfer is aligned with the interest of the defaulting participant and the non-defaulting customer.

Key Consideration 4 - *A CCP should disclose its rules, policies, and procedures relating to the segregation and portability of a participant's customers' positions and related collateral. In particular, the CCP should disclose whether customer collateral is protected on an individual or omnibus basis. In addition, a CCP should disclose any constraints, such as legal or operational constraints, that may impair its ability to segregate or port a participant's customers' positions and related collateral.*

The structure of individualised accounts at the customer level, the provisions governing segregation and portability of positions and collateral at the individual customer level, and the rules and procedures for addressing default events while assuring such segregation and portability are described in the rulebooks, operational procedures manuals and risk management manuals of BM&FBOVESPA's clearinghouses.

BM&FBOVESPA believes there are no constraints capable of impairing the ability of its clearinghouses to fully segregate or transfer the positions and collateral of any investor. It also considers that there are no risks, costs or uncertainties associated with its segregation and portability arrangements, since account segregation at the investor level, required by the applicable regulations, has already been implemented.

It should be noted, however, that in the case of BM&FBOVESPA Clearinghouse, solely and specifically with regard to collateral consisting of master letters of credit and third-party Brazilian government bonds, portability at the customer level does not apply because this type of collateral is not held by the final customer but by the participant responsible for the customer, which at its discretion allocates part of this collateral to cover the customer's margin requirement. It is also important to note that (i) position transfer requires the existence of sufficient collateral to cover risk at the receiving end; and (ii) if transfer should prove impossible (owing to insufficient collateral to cover risk at the receiving end, for example), then the positions must be closed out at the origin, in which case the process is covered by the master letter of credit and third-party Brazilian government bonds. Finally, as noted under Principle 5 (Collateral), BM&FBOVESPA Clearinghouse sets limits for the use of master letters of credit and third-party Brazilian government bonds, with daily monitoring of participant compliance by Risk Management Department. Moreover, the volume of such collateral is small (0.1% of total collateral on June 30, 2017).

PRINCIPLE 15 – GENERAL BUSINESS RISK

PRINCIPLE 15 – GENERAL BUSINESS RISK: *An FMI should identify, monitor, and manage its general business risk and hold sufficient liquid net assets funded by equity to cover potential general business losses so that it can continue operations and services as a going concern if those losses materialise. Further, liquid net assets should at all times be sufficient to ensure a recovery or orderly wind-down of critical operations and services.*

Key Consideration 1 - *An FMI should have robust management and control systems to identify, monitor, and manage general business risks, including losses from poor execution of business strategy, negative cash flows, or unexpected and excessively large operating expenses.*

BM&FBOVESPA has robust management and control systems to identify, monitor and manage its general business risks, including potential losses due to inadequate execution of business strategy, negative cash flows, unexpected and excessively large operating expenses, litigation, or operating failures. The governance structure for defining risk appetite and the definition of risk appetite itself are established by BM&FBOVESPA's Board of Directors.

BM&FBOVESPA has implemented two different approaches to identify, monitor and manage its general business risks: top-down and bottom-up. In the top-down approach, the risks to which BM&FBOVESPA is exposed and their profile are analysed and listed by the directors, and from this list a subset of mission-critical risks is extracted for monitoring and assessment. This analysis gives rise to results based on comprehensive information that generate BM&FBOVESPA's risk profile and an executive view of its general business risks.

In the bottom-up approach, BM&FBOVESPA's risk profile is created using information about operational details of processes. This level of detail provides a better definition of response to risk and risk classification measures, enabling continuous risk management supervision using indicators.

The risk profile is based on two variables, probability and impact, both measured in quantitative and qualitative terms on a pre-defined scale. Probability represents the likelihood of materialisation of the risk in a particular period, while impact represents the severity of its effects on BM&FBOVESPA's cash flow and capital.

When the Internal Controls, Compliance and Corporate Risk Department assesses risk, it focuses on the controls used to mitigate and manage the risks identified. The controls identified are periodically evaluated by Internal Auditing based on an auditing plan approved by the Audit Committee. If it is found that there are no controls to mitigate particular risks, the business area establishes action plans to implement controls.

Key risk indicators (KRIs) are established and monitored to determine the probability of materialisation of the main risks identified and their impact. For risks deemed to have a major impact, solutions are developed to minimise them.

BM&FBOVESPA has a Corporate Risk Advisory Committee, which meets once a month to evaluate and continuously monitor operational, strategic, financial, and regulatory risks.

Furthermore, BM&FBOVESPA has put in place a number of policies relating to internal controls, corporate risk and operational risk, information security, and the conduct of employees and participants.

Key Consideration 2 - *An FMI should hold liquid net assets funded by equity (such as common stock, disclosed reserves, or other retained earnings) so that it can continue operations and services as a going concern if it incurs general business losses. The amount of liquid net assets funded by equity an FMI should hold should be determined by its general business risk profile and the length of time required to achieve a recovery or orderly wind-down, as appropriate, of its critical operations and services if such action is taken.*

BM&FBOVESPA believes its general business risks, as per the draft recovery plan presented to BCB in December 2016, do not entail a recovery or orderly wind-down. Nevertheless, the Board of Directors has instructed management to keep in reserve sufficient liquid own funds to cover operating costs for six months (R\$714 million on August 28, 2017).

These funds are held in the form of highly liquid securities with sovereign credit risk and no market risk, in accordance with BM&FBOVESPA's Financial Investment Policy.

Key Consideration 3 - *An FMI should maintain a viable recovery or orderly wind-down plan and should hold sufficient liquid net assets funded by equity to implement this plan. At a minimum, an FMI should hold liquid net assets funded by equity equal to at least six months of current operating expenses. These assets are in addition to resources held to cover participant defaults or other risks covered under the financial resources principles. However, equity held under international risk-based capital standards can be included where relevant and appropriate to avoid duplicate capital requirements.*

See Key Consideration 2.

Key Consideration 4 - *Assets held to cover general business risk should be of high quality and sufficiently liquid in order to allow the FMI to meet its current and projected operating expenses under a range of scenarios, including in adverse market conditions.*

See Key Consideration 2.

Key Consideration 5 - *An FMI should maintain a viable plan for raising additional equity should its equity fall close to or below the amount needed. This plan should be approved by the board of directors and updated regularly.*

BM&FBOVESPA has a Capital Increase Plan for use if general business risks materialise. The plan was approved by the Board of Directors in December 2015.

PRINCIPLE 16 – CUSTODY AND INVESTMENT RISKS

PRINCIPLE 16 – CUSTODY AND INVESTMENT RISKS: *An FMI should safeguard its own and its participants' assets and minimise the risk of loss on and delay in access to these assets. An FMI's investments should be in instruments with minimal credit, market, and liquidity risks.*

Key Consideration 1 - *An FMI should hold its own and its participants' assets at supervised and regulated entities that have robust accounting practices, safekeeping procedures, and internal controls that fully protect these assets.*

BM&FBOVESPA's own assets and the assets of participants for which it is responsible are held under supervision and regulation governed by pertinent laws, rules and procedures, which assure the use of robust accounting practices, safekeeping procedures and internal controls that fully protect the assets concerned. For example, government bonds are held at SELIC, stocks, units and ETF shares are held at BM&FBOVESPA Central Depository, CDs are held at CETIP, and assets deposited abroad are held at Euroclear and/or DTCC.

Of all the assets posted as collateral by clearinghouse participants, only cash (local currency or USD) can be invested by BM&FBOVESPA, and such investment must comply with the restrictions established in BM&FBOVESPA's Financial Investment Policy in order to maintain a high level of liquidity and capital preservation (see under Principle 7, Key Consideration 5). The same restrictions apply to BM&FBOVESPA's own funds, except those used in the strategic investment program in Latin American exchanges (see under Key Consideration 4).

With regard to the assets deposited by investors for custody by BM&FBOVESPA Central Depository, see under Principle 11.

Key Consideration 2 - *An FMI should have prompt access to its assets and the assets provided by participants, when required.*

In its clearinghouse and CSD activities, BM&FBOVESPA has prompt access to its assets and the assets posted by participants, when required.

With regard to the assets deposited by investors for custody in BM&FBOVESPA Central Depository, the legal basis for this service is as follows:

- Law 6404/76 (article 41) and CVM Instruction 541/13 govern custody of fungible shares, stating that an institution acting as a depository for fungible shares has fiduciary ownership of the shares (granted to the CSD to ensure that assets held in custody are kept separate from other assets held by the same entity) and that the CSD's obligations are safekeeping of the assets deposited with it for the purposes of custody, ensuring that all payments and corporate events are sent to the beneficial owner of the assets, and issuing regular account statements.

BM&FBOVESPA has systems, plans and rules to ensure that the assets belonging to users of these systems are adequately protected and managed.

With regard to the activities of BM&FBOVESPA's clearinghouses:

- Law 10214/01, CMN Resolution 2882/01 and BCB Circular 3057/01 supply the legal basis for recognition of the finality and irrevocability of settlement, and ensure that clearinghouses have priority over the assets pledged as collateral in the event of participant default in order to permit continuity of the settlement process and the fulfillment of its obligations, and to guarantee the rights arising from ownership of assets held in custody.
- With regard to collateral posted abroad, a 2015 study to review acceptance of such collateral concluded that such collateral enjoys the same legal certainty and the same degree of enforceability as collateral constituted in Brazil (see Principle 1, Key Consideration 1).
- When collateral posted by participants is transferred, including for the purpose of executing such collateral, instructions to this effect are sent by the clearinghouses directly to the CSD without involving third parties. Brazilian government bonds are held in a clearinghouse account with SELIC and the clearinghouse itself is the account custodian; the same applies to ETF shares, units and stocks (held by BM&FBOVESPA Central Depository), CDs, LCIs, LCAs (held by CETIP and/or in BM&FBOVESPA's trade repository), and collateral posted abroad (held by Euroclear and/or DTCC). Cash collateral in local currency and USD is held in the clearinghouse's name and invested in compliance with BM&FBOVESPA's Financial Investment Policy, as noted under Key Consideration 1.

Key Consideration 3 - *An FMI should evaluate and understand its exposures to its custodian banks, taking into account the full scope of its relationships with each.*

BM&FBOVESPA evaluates its exposure to the banks it engages to manage its investments, taking into account the full scope of its relationship with each one. These banks are top-tier institutions in Brazil.

With regard to BM&FBOVESPA's activities as a CSD, the assets deposited by investors at BM&FBOVESPA Central Depository are held under BM&FBOVESPA Central Depository fiduciary ownership (see Key Consideration 2), not by custodians (which are responsible for the operating procedures related to the safekeeping of such assets).

As for the collateral posted to its clearinghouses by participants, BM&FBOVESPA operates directly in the respective central depositories and registration systems without the intermediation of custodians.

Thus BM&FBOVESPA is exposed to custodian banks only insofar as its cash holdings and cash collateral posted by clearinghouses participants are concerned.

Key Consideration 4 - *An FMI's investment strategy should be consistent with its overall risk management strategy and fully disclosed to its participants, and investments should be secured by,*

or be claims on, high-quality obligors. These investments should allow for quick liquidation with little, if any, adverse price effect.

BM&FBOVESPA's financial investment strategy is consistent with its risk management strategy. Its Financial Investment Policy imposes restrictions on investment of its own assets and those of third parties (participant collateral) with the aim of limiting exposure to market, credit, liquidity and operational risks, while assuring capital preservation and the sustainability of the business (see under Principle 7, Key Consideration 5).

As a result, BM&FBOVESPA invests mainly in Brazilian government bonds or financial instruments backed by them, with floating-rate returns, immediate liquidity, and minimal exposure to private credit risk.

The restrictions imposed by the Financial Investment Policy are valid for investment of BM&FBOVESPA's cash holdings and the cash collateral posted by participants in its clearinghouses, but not for the strategic investment program in Latin American exchanges. This program is defined by the Board of Directors as part of BM&FBOVESPA's strategic planning and involves solely BM&FBOVESPA's own funds (by June 30, 2017, some R\$281 million had been invested in equity interests in Bolsa de Comercio de Santiago, Bolsa Mexicana de Valores, Bolsa de Valores de Colombia and Bolsa de Valores de Lima).

BM&FBOVESPA's asset allocation and financial and other investments are disclosed in its financial statements, which are available from its investor relations portal (ri.bmfbovespa.com.br).

PRINCIPLE 17 – OPERATIONAL RISK

PRINCIPLE 17 – OPERATIONAL RISK: *An FMI should identify the plausible sources of operational risk, both internal and external, and mitigate their impact through the use of appropriate systems, policies, procedures, and controls. Systems should be designed to ensure a high degree of security and operational reliability and should have adequate, scalable capacity. Business continuity management should aim for timely recovery of operations and fulfilment of the FMI's obligations, including in the event of a wide-scale or major disruption.*

Key Consideration 1 - *An FMI should establish a robust operational risk-management framework with appropriate systems, policies, procedures, and controls to identify, monitor, and manage operational risks.*

BM&FBOVESPA has a robust framework for operational risk management comprising appropriate systems, policies, procedures and controls to identify, monitor and manage operational risks.

BM&FBOVESPA's Operational Risk Policy, available from BM&FBOVESPA's investor relations portal (ri.bmfbovespa.com.br), establishes the principles, guidelines and responsibilities of BM&FBOVESPA's operational risk management process, so as to enable the identification, assessment, treatment, monitoring and communication of the operational risks inherent in its business activities and the information technology that supports the operation of its trading and post-trading environments and systems, and its corporate processes. The Risk and Financial Committee and the Audit Committee conduct annual reviews of the policy, which is approved by the Board of Directors.

As noted in Principle 3, Key Consideration 1, BM&FBOVESPA's Corporate Risk Management Policy includes operational risks. The methodology for conducting the operational risk management process and the standards to be followed therein are defined by Internal Controls, Compliance and Corporate Risk Department, and approved by the Risk and Financial Committee.

With regard to the monitoring and management of the risks identified, the Corporate Risk Advisory Committee and the Board of Directors' Risk and Financial Committee evaluate monthly the evolution of corporate risks (strategic, financial, operational and regulatory risks) by analysing structured information and indicators. The former committee is made up of nine directors representing all executive offices of BM&FBOVESPA; its members support the prioritisation and treatment of risks. The latter committee is made up of at least four board members, who may or may not be independent. The Internal Controls, Compliance and Corporate Risk Department issues a semiannual corporate risk report on the evolution of strategic, financial, operational and legal risks in the period and the results of their monitoring. The report is discussed by the Corporate Risk Advisory Committee and submitted for approval to the Executive Board, Audit Committee, Risk and Financial Committee and Board of Directors. After approval it is sent to BCB, CVM and BSM.

To ensure that BM&FBOVESPA's operating procedures are implemented appropriately, the governance of its risk management and internal controls is structured in terms of lines of defence, as described under Principle 3, Key Consideration 1:

1st line of defence – implementation and maintenance of the system of internal controls.

2nd line of defence – analysis of the system of internal controls.

3rd line of defence – evaluation of the system of internal controls by internal auditing.

4th line of defence – evaluation by independent outside auditors and regulatory supervision.

The Internal Controls Policy, available from BM&FBOVESPA's investor relations portal (ri.bmfbovespa.com.br), establishes principles, guidelines and responsibilities designed to assure the strengthening and proper functioning of its internal control systems.

With regard to human resources, BM&FBOVESPA has formally defined norms and procedures for human resources management containing specific items relating to employee training, performance assessment, quality-of-life programs, and a long-term remuneration policy (stock grant plan). The effectiveness of this policy is regularly evaluated using indicators, including a measure of employee turnover. For fraud prevention, BM&FBOVESPA conducts activities such as periodic analysis of access, segregation of duties and functions, and training in the code of conduct.

With regard to the risk that changes and projects may affect the smooth functioning of its systems, BM&FBOVESPA's Project Management Office (PMO) tracks the progress of ongoing projects and monitors the main changes, assuring a formal new project approval process and adequate development of approved projects, including the availability of the financial, technological and human resources required to complete them. The PMO reports weekly on the progress of all strategic projects to the Executive Board, while the progress of departmental projects is reported to the respective teams. Three main areas are responsible for every project: IT, Operations, and the PMO.

Key Consideration 2 - *An FMI's board of directors should clearly define the roles and responsibilities for addressing operational risk and should endorse the FMI's operational risk management framework. Systems, operational policies, procedures, and controls should be reviewed, audited, and tested periodically and after significant changes.*

BM&FBOVESPA's Board of Directors has established and implemented a Corporate Risk Management Policy, an Operational Risk Policy, a Business Continuity Policy, an Information Security Policy, and an Internal Controls Policy. All these policies are reviewed annually and are available from the investor relations portal (ri.bmfbovespa.com.br).

Changes to the structure for managing corporate risks, including operational risk, are submitted by Internal Controls, Compliance and Corporate Risk Department to the Audit Committee and Risk and Financial Committee, which advise the BM&FBOVESPA's Board of Directors.

Internal audits are conducted by BM&FBOVESPA's Auditing Department, based on an annual work plan approved by the Audit Committee and defined according to the relevance of the risks borne by each business area as well as the historical data relating to previous work.

Participants are audited by BSM, which performs annual tests to make sure they comply with the rules established by the regulators and by BM&FBOVESPA, including the Operational Qualification Program (PQO).

BM&FBOVESPA's operational risk management framework is subject to external audit. The scope and extent of the tests performed are defined by the external auditors and approved by the Audit Committee.

Key Consideration 3 - *An FMI should have clearly defined operational reliability objectives and should have policies in place that are designed to achieve those objectives.*

BM&FBOVESPA has clearly defined operational reliability objectives, and has policies and rules in place, as well as business continuity plans, that are designed to achieve those objectives.

BM&FBOVESPA's clearinghouses are considered systemically important in Brazil, in accordance with the criteria of the Brazilian Payment System (SPB), and must therefore guarantee operational availability (uptime) equal to or better than 99.8%, as required by article 10 of BCB Circular 3057.

The governance of BM&FBOVESPA's risk management and internal controls is structured in lines of defence, as described under Principles 3 and 17.

Key Consideration 4 - *An FMI should ensure that it has scalable capacity adequate to handle increasing stress volumes and to achieve its service-level objectives.*

The Infrastructure and Production Department performs capacity tests as requested (performance, load, limit, availability), as well as certification tests.

The capacity planning methodology is documented, describing the systems evaluation procedures and techniques using prototypes, reference points and data capture, as well as performance modelling, simulation and load testing.

Demand for increased capacity stems from new business development, strategic positioning requirements and organic systems growth. Estimates are based on projections for service use and previous experience with growth of service use. Capacity revisions occur when systems change and new projects that may affect scalability are implemented (e.g. when BM&FBOVESPA Clearinghouse went live in August 2014).

BM&FBOVESPA uses tools to manage performance proactively, collecting data with which to evaluate capacity in terms of IT resources and performance. The process includes the production of capacity management reports, which serve as a basis for calibrating capacity and performance requirements, enabling IT to initiate projects to upgrade technological resources in line with demand.

Key Consideration 5 - *An FMI should have comprehensive physical and information security policies that address all potential vulnerabilities and threats.*

BM&FBOVESPA has physical and information security policies.

With regard to physical access to its environments, BM&FBOVESPA has implemented building access control using badges, data centre access control using a biometric system, monitoring by closed-circuit television (CCTV), and a surveillance system with its own monitoring centre that operates around the clock seven days a week, in compliance with Federal Law 7102/1983.

With regard to the control of environmental factors, BM&FBOVESPA has a Building Management System (BMS), a precision air conditioning system monitored 24x7 by a dedicated monitoring centre, a power network and Uninterruptible Power Supply (UPS) system, an on-site mission-critical team (24x7) with training in specific routines for mission-critical environments, a fire detection and firefighting system compliant with NFPA 72 (National Fire Alarm and Signalling Code) and NFPA 2001 (Standard on Clean Agent Fire Extinguishing Systems), preventive and predictive maintenance routines in line with mission-critical best practice, and facilities infrastructure testing according to a pre-defined annual program.

BM&FBOVESPA's data centre is housed in a separate environment equipped with access, temperature and humidity controls, specific dedicated fire prevention and firefighting equipment, and an alternative power source.

BM&FBOVESPA's change management and project management processes ensure that changes and major projects must be totally approved, and previously assessed for risk and analysis of impact on physical security.

With regard to information security, BM&FBOVESPA has an Information Security Policy, which is available from its investor relations portal (ri.bmfbovespa.com.br), and rules to be followed in the various situations in which information is treated. The Information Security Management Committee, which comprises members of several departments, evaluates BM&FBOVESPA's information security strategy and guidelines. Non-conformities with the Information Security Policy and rules are handled in accordance with the Corporate Risk Management Policy.

BM&FBOVESPA has a Security Operations Centre (SOC) which operates around the clock seven days a week. The SOC is responsible for security monitoring and treatment of IT incidents (detecting and responding to invasion attempts), ethical hacking, and internal and external audits that continuously assess information security controls.

BM&FBOVESPA's Information Security Department adopts international best practice and standards, such as the ISO 27000 family of standards.

Key Consideration 6 - *An FMI should have a business continuity plan that addresses events posing a significant risk of disrupting operations, including events that could cause a wide-scale or major disruption. The plan should incorporate the use of a secondary site and should be designed to ensure that critical information technology (IT) systems can resume operations within two hours following disruptive events. The plan should be designed to enable the FMI to complete settlement by the end of the day of the disruption, even in case of extreme circumstances. The FMI should regularly test these arrangements.*

BM&FBOVESPA has business continuity and crisis management rules, a business continuity policy, a business continuity committee, and a business continuity management system designed to minimise the financial, operational, legal and regulatory impacts of a lack or shortage of human, material and technological resources essential to the secure functioning of its operations.

According to BM&FBOVESPA's Business Continuity Policy, the business continuity management system must include mechanisms to (i) identify internal and external threats capable of compromising the continuity of operations, the possible impact on operations if such threats materialise, and the requirements for continuity, including legal and regulatory requirements; (ii) establish the roles and responsibilities of internal and external parties; (iii) develop a crisis management and response framework with adequate levels of authority and competence to assure effective communication; (iv) develop processes and mechanisms that assure a recovery of activities; (v) conduct training, testing and analysis to assure the maintenance and smooth functioning of the continuity plans.

BM&FBOVESPA's business continuity plans consists of operational contingency plans (OCPs), which establish alternative procedures to be executed in the event of critical process interruptions, with a list of key personnel and alternative activities; workplace contingency plans (WCPs), which restore failed processes using an alternative workplace, with a list of key teams and priority activities; technology disaster recovery plans (TDRPs), which activate the contingency technology infrastructure, with a list of teams, resources, technical procedures, execution sequence and premises; and crisis management plans (CMPs), which designate an officer responsible for analysing the impact of disruption, declaring a crisis, and keeping interested parties informed about the recovery.

The plans are updated and tested at least annually. Participants and suppliers of critical services are invited to take part in testing at least once a year.

BM&FBOVESPA has an annual calendar for testing its business continuity plans to check their capacity to achieve the recovery objectives set, among other things, considering large-scale material disruption scenarios, such as total loss of technological resources and/or the workplace. Mission-critical processes are identified on the basis of a business impact analysis (BIA) by Business Continuity Management, a division of the Internal Control, Compliance and Corporate Risk Department. For mission-critical processes according to the BIA, recovery time objectives (RTOs) and recovery point objectives (RPOs) are defined.

The Business Continuity Committee, with ten directors, monitors and evaluates the recovery objectives and test results, and selects the mission-critical processes that must have a two-hour RTO. These include, for example, trading session opening procedures, collateral and liquidity facilities management, settlement management, OTC trade registration management, intraday risk management, and operational crisis management.

These processes have formal business continuity plans and an alternative workplace with dedicated IT resources. The architecture of the technology that supports the processing of settlement is designed to eliminate single points of failure.

Data replication between the primary and secondary (contingency) data centres occurs in synchronous mode, and the technological environment is characterised by high availability (if a specific IT resource presents a problem, another resource on the same site can replace it) and disaster recovery (if resources on the same site present problems, resources on the backup site can replace them). Business areas have procedures to verify data integrity if processes are interrupted. These procedures can be run on the primary site or on the secondary site after execution of recovery procedures.

Key Consideration 7 - *An FMI should identify, monitor, and manage the risks that key participants, other FMIs, and service and utility providers might pose to its operations. In addition, an FMI should identify, monitor, and manage the risks its operations might pose to other FMIs.*

The risks arising from participants and service providers, as well as mitigating actions, are identified by BSM in the process of assessing the Operational Qualification Program (PQO), and by Internal Controls, Compliance and Corporate Risk Department.

The main risk factors arising from participants are failure of the external network used to settle transactions, participant operational failures, failure of Know Your Customer processes and money laundering prevention activities, participant custody fraud, special auction fraud, reliance on suppliers and service providers for critical processes, and inadequate participant technology infrastructure.

Through its clearinghouses' relationship matrix, BM&FBOVESPA maps FMIs with which it has relationships, assessing the risks associated with existing interdependencies, and using this information to identify scenarios and develop action plans to mitigate the impact of risk materialisation. These plans are part of BM&FBOVESPA's Business Continuity Plan.

BM&FBOVESPA publishes an annual timetable of Business Continuity Plan tests so that market participants are aware of and can take part in the tests.

BM&FBOVESPA's agreements with key service providers contain clauses that assure adequate service levels, including availability and contingency requirements.

PRINCIPLE 18 – ACCESS AND PARTICIPATION REQUIREMENTS

PRINCIPLE 18 – ACCESS AND PARTICIPATION REQUIREMENTS: *An FMI should have objective, risk-based, and publicly disclosed criteria for participation, which permit fair and open access.*

Key Consideration 1 - *An FMI should allow for fair and open access to its services, including by direct and, where relevant, indirect participants and other FMIs, based on reasonable risk-related participation requirements.*

In its clearinghouse, CSD and TR activities, BM&FBOVESPA allows fair and open access to its services based on risk-related requirements.

Participants in BM&FBOVESPA’s clearinghouses, CSD and TR activities are subject to the definitions, rules, criteria and requirements stipulated in their normative documents governing access, listed in the table below.

The requirements for participants’ access to BM&FBOVESPA’s environments, systems and markets encompass economic and financial characteristics, collateral posting, operations, functional aspects (including conduct), technical capabilities, and information security.

Financial market infrastructure	Applicable access rules
BM&FBOVESPA Clearinghouse Foreign Exchange Clearinghouse iBalcão BM&FBOVESPA’s Central Securities Depository	BM&FBOVESPA Access Rules BM&FBOVESPA Access Manual

CVM Instruction 461/07, which disciplines securities markets, states that the entities authorised by CVM to manage organised securities markets (such as BM&FBOVESPA) must issue rules governing participant admission procedures. Article 51, §2, states that “the requisites for admission as a person authorised to trade shall observe the principles of equality of access and respect for competition”. BM&FBOVESPA complies with this requirement and its access rules have been duly approved by the regulators.

To assure the transparency of its access conditions and facilitate open and fair access to its services, BM&FBOVESPA publishes the access rules and all other normative documents on its website (in Regulation / Regulations and Manuals).

According to BM&FBOVESPA’s access definitions, participants are divided into “authorised participants” and “registered participants”. Authorised participants are granted access by the Board of Directors and comprise clearing members (including participating banks in the Foreign Exchange Clearinghouse), full trading participants, trading participants and settlement participants in

BM&FBOVESPA Clearinghouse, custody agents, and registration participants. Registered participants comprise customers / investors, agribusiness and gold depositories, and issuers, among others.

Compliance with access requirements is a necessary condition for the granting of access to applicants and maintenance of access by participants.

Currently there are no external financial market infrastructures that require access to BM&FBOVESPA's infrastructure. Nor are there any FMIs that offer the same services as BM&FBOVESPA, except TRs for OTC derivatives and financial assets. Although BM&FBOVESPA's TR is not directly interconnected with others, its system can track transactions that migrate from or to other TRs.

Key Consideration 2 - *An FMI's participation requirements should be justified in terms of the safety and efficiency of the FMI and the markets it serves, be tailored to and commensurate with the FMI's specific risks, and be publicly disclosed. Subject to maintaining acceptable risk control standards, an FMI should endeavour to set requirements that have the least-restrictive impact on access that circumstances permit.*

BM&FBOVESPA's access requirements are justified in terms of protecting the safety and efficiency of its clearinghouse, CCP, CSD and TR activities, and of the markets they serve, as well as being tailored to and commensurate with the risks to which BM&FBOVESPA is exposed, especially the risks associated with its CCP function.

The first requirement applicable to participants is compliance with the rules and legal norms applicable to their activities, and with the obligation to obtain all the necessary authorisations from BCB, CVM and other competent authorities.

The main economic and financial requirements are the obligation to maintain minimum levels of equity and liquidity.

The collateral posting requirements apply to clearinghouse participants to assure maintenance of their safeguard structures. Clearing members, including the banks that participate in the Foreign Exchange Clearinghouse, must deposit collateral for the settlement funds held by the clearinghouses in which they participate. Furthermore, full trading participants and settlement participants in BM&FBOVESPA Clearinghouse must deposit "minimum non-operating collateral".

The operational and functional requirements participants must meet are those established in BM&FBOVESPA's Operational Qualification Program (PQO), as well as the requirements regarding the conduct of their proprietors and executives.

As part of the admission process, BSM performs a pre-operational audit to verify that the applicant's processes and internal controls comply with the criteria and requirements established by BM&FBOVESPA, basing this audit on the PQO's Basic Guidelines.

The Credit Risk Technical Committee performs a technical analysis of applications for access authorisations, based on pre-operational audit reports, the documentation filed by applicants for

admission, and credit risk assessments by Risk Management Department. Its recommendations go to the CEO, who in turn submits his recommendations to the Board of Directors.

According to BM&FBOVESPA's Bylaws, access rules and criteria must be approved by the Board of Directors. Moreover, according to the applicable rules and regulations, they must first be approved by BCB and CVM.

All access and other normative documents issued by BM&FBOVESPA are published on its website (in Regulation / Regulations and Manuals).

Key Consideration 3 - *An FMI should monitor compliance with its participation requirements on an ongoing basis and have clearly defined and publicly disclosed procedures for facilitating the suspension and orderly exit of a participant that breaches, or no longer meets, the participation requirements.*

BM&FBOVESPA monitors participants' compliance with the applicable requirements on an ongoing basis. It also clearly defines and publicly discloses the procedures for this supervision, as well as the penalties for non-compliance. According to CVM Instruction 461/07, the entities authorised by CVM to manage organised securities markets (such as BM&FBOVESPA) must issue rules governing the procedures for admission, suspension and exclusion of participants.

Given that compliance with the access requirements is a necessary condition for maintenance of access authorisations, participants are regularly monitored after being licensed. Compliance with economic and financial requirements is verified on a monthly basis by BSM and the Credit Risk Technical Committee independently. Compliance with the other requirements is verified at least annually by means of BSM's audits. Participants with a deteriorating risk profile are monitored more frequently by BSM. The Credit Risk Technical Committee also periodically analyses participants' financial situation and capacity.

Participants that fail to comply with access requirements are subject to the penalties specified in BM&FBOVESPA's access rules (warnings, fines, provisional suspension, and cancellation of access authorisations), as well as the penalties specified in BSM's rules (warnings, fines, suspension of activities for up to 90 days, and disqualification for up to ten years from holding positions in senior management or being on the staff, trading, and acting on behalf of participants or agents of BM&FBOVESPA or BSM).

Also among the duties of authorised participants established by BM&FBOVESPA's access rules is compliance with all rules and procedures called for by BM&FBOVESPA and BSM in their normative documents. Participants who fail to comply with the rulebooks and manuals of BM&FBOVESPA's clearinghouses, CSD and TR, according to the scope of their access authorisation, are therefore subject to the penalties mentioned in the previous paragraph, and may have their access authorisations suspended or cancelled.

PRINCIPLE 19 – TIERED PARTICIPATION ARRANGEMENTS

PRINCIPLE 19 – TIERED PARTICIPATION ARRANGEMENTS: *An FMI should identify, monitor, and manage the material risks to the FMI arising from tiered participation arrangements.*

Key Consideration 1 - *An FMI should ensure that its rules, procedures, and agreements allow it to gather basic information about indirect participation in order to identify, monitor, and manage any material risks to the FMI arising from such tiered participation arrangements.*

In its clearinghouse, CCP, CSD and TR activities, BM&FBOVESPA's rules and procedures allow it to gather the information about indirect participation needed to manage risk.

BM&FBOVESPA follows the individual customer segregation model, using individual segregated customer accounts for the registration of transactions, position control, and collateral management. Its clearinghouses, CSD and TR therefore have the capacity to gather and assess risk information at the customer/investor level. Direct participants must keep up to date all information regarding the indirect participants linked to them, as required by CVM. Additional information may also be collected and accessed by direct request or via the audits of direct participants executed by BM&FBOVESPA.

Customers, wealth managers, asset managers, distributors and global custodians are examples of indirect participants that use the services of BM&FBOVESPA's direct participants (brokerage houses, clearing members, custody agents etc).

Although BM&FBOVESPA's risk systems assess risk at the customer level, BM&FBOVESPA's Credit Risk Technical Committee also assesses the risks arising from the relationships and links among participants. The committee evaluates the economic and financial health of direct participants as well as indirect participants considered significant.

Key Consideration 2 - *An FMI should identify material dependencies between direct and indirect participants that might affect the FMI.*

BM&FBOVESPA knows the entire chain of responsibilities and is therefore able to map the dependencies between direct and indirect participants. Its analysis of these dependencies also takes into account groups of participants belonging to the same economic or financial conglomerates.

Key Consideration 3 - *An FMI should identify indirect participants responsible for a significant proportion of transactions processed by the FMI and indirect participants whose transaction volumes or values are large relative to the capacity of the direct participants through which they access the FMI in order to manage the risks arising from these transactions.*

BM&FBOVESPA continuously monitors the volume and frequency of all direct and indirect participants' transactions and positions. It has a transparent multilevel system that operates at the segregated customer level throughout its chain of processes, so that its clearinghouses, CSD and TR can monitor the risks arising from all participants (direct and indirect).

Residual risks at each level of the chain of responsibilities are assessed daily and checked "against" the net capacity of the participant responsible for the chain below. In this analysis participants are divided into groups, each group with a substantial probability of defaulting simultaneously.

BM&FBOVESPA mitigates operational risk by auditing direct participants. These audits also cover indirect participant data.

Key Consideration 4 - *An FMI should regularly review risks arising from tiered participation arrangements and should take mitigating action when appropriate.*

BM&FBOVESPA's rules and procedures are reviewed and updated, whenever considered necessary, by all the departments involved, each in its respective areas of competence (e.g. Legal, Risk Management, and Settlement). This process mitigates risks (the main provisions of the Normative Structure Policy require a governance process for the creation and issuance of rules and the establishment of procedures for regular reviews of all normative documents).

BM&FBOVESPA's Market Risk and Credit Risk Technical Committees are the main forums for proposing and defining mitigating actions, such as changes to rules, procedures, operational limits, and concentration limits for positions and collateral.

PRINCIPLE 20 – FMI LINKS

PRINCIPLE 20 – FMI LINKS: An FMI that establishes a link with one or more FMIs should identify, monitor, and manage link-related risks.

Key Consideration 1 - Before entering into a link arrangement and on an ongoing basis once the link is established, an FMI should identify, monitor, and manage all potential sources of risk arising from the link arrangement. Link arrangements should be designed such that each FMI is able to observe the other principles in this report.

BM&FBOVESPA's clearinghouses have operating agreements with some FMIs for the purposes of accepting or transferring collateral. Its clearinghouses, for example, have collateral accounts with SELIC for collateral consisting of Brazilian government bonds, and with CETIP for collateral consisting of CDs registered there. This arrangement is recognised in Brazilian law (Law 10214/01), assuring BM&FBOVESPA's fiduciary ownership of assets posted as collateral as well as segregation and correct identification of positions. SELIC and CETIP are part of the SPB, and regulated and supervised by BCB and/or CVM, which follow the PFMI in their supervisory and monitoring activities. For collateral posted abroad, BM&FBOVESPA Clearinghouse has accounts with Euroclear and DTCC to hold collateral consisting of US Treasuries, German Bunds and ADRs.

BM&FBOVESPA Central Depository has links with Caja de Valores (Argentina) and Iberclear (Spain) via agreements approved in advance by CVM and BCB. The agreement with Caja de Valores is based on a bilateral model enabling cross-listing of securities issued by Argentinian companies in Brazil and vice-versa. The agreement with Iberclear is unilateral, enabling only the listing of Brazilian securities in Spain. In the bilateral model, Brazilian issuers interested in operating under the agreement must apply for permission from CVM and BCB to list their securities in foreign markets. The agreements do not allow for the issuance or cancellation of certificates but only the direct trading of shares. No intermediation by custodians is involved, as this role is played by the CSDs that are parties to the agreements. Such agreements must be approved in advance by the regulatory authorities.

Once an agreement has been established, BM&FBOVESPA uses daily reconciliation procedures to validate the quantity of securities deposited in the partner CSD's account with BM&FBOVESPA Central Depository against the quantity reported by the partner CSD.

Securities held under the agreement by BM&FBOVESPA Central Depository are held in accounts identified in the name of the partner CSD but under BM&FBOVESPA's custody and subject to controls regarding account movement and treatment of corporate events. The ownership rules established in Brazilian law are enforced, and BM&FBOVESPA cannot be held liable for any aspects of receipts or shares issued abroad and governed by foreign laws.

Key Consideration 2 - A link should have a well-founded legal basis, in all relevant jurisdictions, that supports its design and provides adequate protection to the FMIs involved in the link.

The links between BM&FBOVESPA's clearinghouses and SELIC and CETIP are established in Brazil. The regulatory framework for collateral is Law 10214/01. With regard to the links with Euroclear and DTCC for collateral posted abroad, in 2015 BM&FBOVESPA completed an update of its assessment as to acceptance of such collateral, concluding that it enjoys the same legal certainty and the same degree of enforceability as collateral constituted in Brazil (see under Principle 1).

In the case of Caja de Valores (Argentina) and Iberclear (Spain), Brazil is the relevant jurisdiction, since BM&FBOVESPA's obligations in connection with these two links are constituted and executed in the environment of BM&FBOVESPA Central Depository.

The legal basis for BM&FBOVESPA's activities is detailed under Principle 1.

Key Consideration 3 - *Linked CSDs should measure, monitor, and manage the credit and liquidity risks arising from each other. Any credit extensions between CSDs should be covered fully with high-quality collateral and be subject to limits.*

Not applicable. BM&FBOVESPA Central Depository does not grant credit to linked CSDs.

Key Consideration 4 - *Provisional transfers of securities between linked CSDs should be prohibited or, at a minimum, the retransfer of provisionally transferred securities should be prohibited prior to the transfer becoming final.*

Not applicable. There are no provisional transfers of securities between BM&FBOVESPA Central Depository and other CSDs.

Key Consideration 5 - *An investor CSD should only establish a link with an issuer CSD if the arrangement provides a high level of protection for the rights of the investor CSD's participants.*

In its links with Caja de Valores and Iberclear, BM&FBOVESPA acts as "issuer CSD", thereby using the individual customer segregation model whereby assets are segregated in accounts held by the final investors, which in this case are the respective CSDs.

As for the controls operated by Caja de Valores and Iberclear, both of them acting as "investor CSDs", in terms of position segregation, account structure and portability arrangements the rules applied are those required by the laws in force in the countries where the respective "investor CSDs" are established. BM&FBOVESPA has no liability with regard to the circulation of receipts or shares issued abroad because this is governed by foreign law.

Key Consideration 6 - An investor CSD that uses an intermediary to operate a link with an issuer CSD should measure, monitor, and manage the additional risks (including custody, credit, legal, and operational risks) arising from the use of the intermediary.

Not applicable. BM&FBOVESPA does not act as an “investor CSD”.

Key Consideration 7 - Before entering into a link with another CCP, a CCP should identify and manage the potential spillover effects from the default of the linked CCP. If a link has three or more CCPs, each CCP should identify, assess, and manage the risks of the collective link arrangement.

Not applicable. BM&FBOVESPA has no links with other CCPs.

Key Consideration 8 - Each CCP in a CCP link arrangement should be able to cover, at least on a daily basis, its current and potential future exposures to the linked CCP and its participants, if any, fully with a high degree of confidence without reducing the CCP’s ability to fulfil its obligations to its own participants at any time.

Not applicable. BM&FBOVESPA has no links with other CCPs.

Key Consideration 9 - A TR should carefully assess the additional operational risks related to its links to ensure the scalability and reliability of IT and related resources.

Not applicable. BM&FBOVESPA’s TR has no links with other FMIs.

PRINCIPLE 21 – EFFICIENCY AND EFFECTIVENESS

PRINCIPLE 21 – EFFICIENCY AND EFFECTIVENESS: An FMI should be efficient and effective in meeting the requirements of its participants and the markets it serves.

Key Consideration 1 - *An FMI should be designed to meet the needs of its participants and the markets it serves, in particular, with regard to choice of a clearing and settlement arrangement; operating structure; scope of products cleared, settled, or recorded; and use of technology and procedures.*

BM&FBOVESPA's clearinghouse, CSD and TR are designed to meet the needs of their participants and the markets they serve, in accordance with the legal and regulatory requirements.

BM&FBOVESPA maintains active relationships with participants, especially through its advisory committees, as well as its distributor relations, sales, international, and market, product and service development departments. Participants' requirements are continuously discussed and analysed, and appropriate solutions are implemented whenever possible and feasible.

An example is BM&FBOVESPA Clearinghouse, resulting from projects to integrate the BM&FBOVESPA's clearinghouses and develop a new risk system. Now that integration of the equity, equity derivatives, fixed-income and securities lending markets into BM&FBOVESPA Clearinghouse has been completed, BM&FBOVESPA Clearinghouse clears and settles more than 90% of total trading volume on BM&FBOVESPA's markets. The benefits of integration and the new risk model include: (i) cost savings (via standardisation of rules, processes and systems, as well as more automation of operating routines); (ii) enhanced liquidity management (thanks to the establishment of a single settlement window); and (iii) more efficient capital allocation by participants, including customers (due to the integrated risk model and single collateral pool). At the end of the project, BM&FBOVESPA's clearing, settlement and CCP service, currently provided through three clearinghouses, will have a single set of rules, a single participant structure, a single registration system, a single process for allocation/position control/clearing/settlement, a single risk management system, and a single safeguard structure.

BM&FBOVESPA is a member of several Brazilian and international associations, participating in their working groups and committees, which enables it to keep up to date and engage more actively with the industry's needs and development.

As the issuer of an important stock in the Brazilian capital market, BM&FBOVESPA has a close relationship with its shareholders.

Key Consideration 2 - *An FMI should have clearly defined goals and objectives that are measurable and achievable, such as in the areas of minimum service levels, risk-management expectations, and business priorities.*

BM&FBOVESPA has clearly defined goals and objectives based on strategic guidelines established by the Board of Directors. These include guaranteeing excellence and market integrity; and focusing on customer and participant relationships.

For each of its guidelines, BM&FBOVESPA has established metrics and propositions with the aim of translating its strategy into practical action and measuring its business success. It has more than 50 key performance indicators (KPIs) to measure and assure the achievement of each guideline. All goals, objectives and KPIs are registered in the management system used to monitor initiatives, so that human resource methodologies can be linked to the performance management system.

Achievement of goals and objectives is one of the key factors determining the compensation paid to BM&FBOVESPA's executives and staff.

Key Consideration 3 - *An FMI should have established mechanisms for the regular review of its efficiency and effectiveness.*

BM&FBOVESPA has implemented a system to evaluate achievement of its objectives and KPIs, the latter being monitored monthly by area. Objectives are reviewed semiannually, and the variable remuneration program for all employees is linked to the extent to which goals are achieved. In addition, BM&FBOVESPA conducts an annual evaluation of its metrics and goals in conjunction with the strategic planning process to ensure that its objectives continue to reflect its strategy.

PRINCIPLE 22 – COMMUNICATION PROCEDURES AND STANDARDS

PRINCIPLE 22 – COMMUNICATION PROCEDURES AND STANDARDS: *An FMI should use, or at a minimum accommodate, relevant internationally accepted communication procedures and standards in order to facilitate efficient payment, clearing, settlement, and recording.*

Key Consideration 1 - *An FMI should use, or at a minimum accommodate, internationally accepted communication procedures and standards.*

BM&FBOVESPA uses internationally accepted communication procedures and standards.

The following communication procedures are used, for example:

- Web services for communication between BM&FBOVESPA Clearinghouse and (i) BM&FBOVESPA Central Depository (for gold), and (ii) iBalcão;
- Web services, FTP and MQ Series for communication:
 - between BM&FBOVESPA's clearinghouses and BM&FBOVESPA Central Depository, and BCB and participants in the STR (for cash settlement in local currency);
 - between BM&FBOVESPA's clearinghouses and other FMIs (SELIC and CETIP), for the movement of collateral;
- FTP for access to public files relating to the clearinghouses and iBalcão, available from BM&FBOVESPA's website;
- SWIFT protocol for communication:
 - between settlement banks abroad and the Foreign Exchange Clearinghouse and BM&FBOVESPA Clearinghouse (cash settlement in USD);
 - between BM&FBOVESPA Central Depository and CSDs in Spain (Iberclear) and Argentina (Caja de Valores), relating to processes executed under international agreements to list Brazilian securities in the countries concerned.

The following communication standards are used, for example:

- ISIN for identification of (i) assets held by BM&FBOVESPA Central Depository; (ii) OTC derivatives and financial assets registered with iBalcão; and (iii) instruments settled through BM&FBOVESPA's clearinghouses. BM&FBOVESPA is the Brazilian numbering agency and the only institution authorised to assign ISIN codes to securities in Brazil;
- ISO 4217 for identification of the types of currency accepted as underlying for OTC derivatives registered with iBalcão;
- ISO15022 (SWIFT) for settlement in USD through BM&FBOVESPA Clearinghouse (non-resident investors in accordance with CMN Resolution 2687) and the Foreign Exchange Clearinghouse;
- Messaging based on ISO20022:

- Used for communication by BM&FBOVESPA Clearinghouse with participants on matters relating to risk management, collateral management, registration of instruments, registration of participants and accounts, trade capture, allocation and give-up, position control, securities lending, cash settlement, pricing, and fees;
- Used by BM&FBOVESPA Central Depository for distance voting.
- SPB (a standard set by BCB in XML format) – used for communication by BM&FBOVESPA’s clearinghouses, BM&FBOVESPA Central Depository and OTC system (iBalcão) with the STR for cash settlement, and by BM&FBOVESPA’s clearinghouses with SELIC and CETIP for the movement of collateral.

With regard to activities relating to cross-border transactions, BM&FBOVESPA uses ISO15022 (SWIFT) and ISIN, as mentioned above.

BM&FBOVESPA does not translate or convert international into domestic standards or vice-versa, as its processes do not require this at present.

PRINCIPLE 23 – DISCLOSURE OF RULES, KEY PROCEDURES AND MARKET DATA

PRINCIPLE 23 – DISCLOSURE OF RULES, KEY PROCEDURES, AND MARKET DATA: *An FMI should have clear and comprehensive rules and procedures and should provide sufficient information to enable participants to have an accurate understanding of the risks, fees, and other material costs they incur by participating in the FMI. All relevant rules and key procedures should be publicly disclosed.*

Key Consideration 1 - *An FMI should adopt clear and comprehensive rules and procedures that are fully disclosed to participants. Relevant rules and key procedures should also be publicly disclosed.*

The rules and procedures governing BM&FBOVESPA Clearinghouse, the Foreign Exchange Clearinghouse, BM&FBOVESPA Central Depository and iBalcão are embodied in their respective normative documents – rulebooks, operating procedures manuals, and risk management manuals (the latter only in the case of the clearinghouses) –, and are publicly available from BM&FBOVESPA’s website (www.bmfbovespa.com.br, Regulation, Regulations and Manuals). They are as follows:

- BM&FBOVESPA Access Rules
- BM&FBOVESPA Access Manual
- BM&FBOVESPA Technology Infrastructure Access Manual

- BM&FBOVESPA Clearinghouse Rules
- BM&FBOVESPA Clearinghouse Operating Procedures Manual
- BM&FBOVESPA Clearinghouse Risk Management Manual

- BM&FBOVESPA Foreign Exchange Clearinghouse Rulebook
- BM&FBOVESPA Foreign Exchange Clearinghouse Operating Procedures Manual
- BM&FBOVESPA Foreign Exchange Clearinghouse Risk Management Manual

- BM&FBOVESPA Central Depository Rules
- BM&FBOVESPA Central Depository Operating Procedures Manual

- BM&FBOVESPA OTC Trade Repository Rulebook (iBalcão)
- BM&FBOVESPA Rulebook for Agribusiness Securities Registration
- BM&FBOVESPA Rules for the Registration of Real Estate Credit Notes (CCI)
- Manuals for products accepted for registration with BM&FBOVESPA’s registration system (LCI, CDB, LF, COE)

BM&FBOVESPA's rules and procedures (as embodied in its rulebooks and manuals) and all amendments to them must be approved by the regulatory authorities before they enter into force. Whenever possible, before submitting proposals for changes to the rules and procedures to the regulatory authorities, BM&FBOVESPA submits drafts to participants for prior discussion via the advisory committees or specific working groups. Once it has obtained the requisite regulatory approvals, BM&FBOVESPA notifies all participants via circular letter that the new normative documents have been published.

The production and alteration of internal normative documents are governed by BM&FBOVESPA's Normative Structure Policy. In accordance with this policy, the Legal Department and the Internal Controls, Compliance and Corporate Risk Department review all rules and procedures to ensure they comply with the regulatory framework, are compatible with BM&FBOVESPA's other normative documents, and are always up to date.

In addition to the specific normative documents for its FMIs, BM&FBOVESPA publishes its Bylaws, codes and policies on its investor relations portal (ri.bmfbovespa.com.br):

- BM&FBOVESPA's Bylaws
- Internal Regulation of the BM&FBOVESPA's Board of Directors
- Internal Regulation of the BM&FBOVESPA's Board of Executive Officers
- Internal Regulation of the Board Advisory Committees
- BM&FBOVESPA's Audit Committee Internal Regiment
- BM&FBOVESPA's Corporate Governance Guidelines
- BM&FBOVESPA's Code of Conduct
- BM&FBOVESPA's Disclosure and Securities Trading Policy Manual
- BM&FBOVESPA's Policy on Related Party Transactions and other Conflict of Interest Situations
- BM&FBOVESPA's Information Security Policy
- BM&FBOVESPA's Corporate Risk Management Policy
- BM&FBOVESPA's Operational Risk Policy
- BM&FBOVESPA's Internal Controls Policy
- BM&FBOVESPA's Business Continuity Policy

Key Consideration 2 - *An FMI should disclose clear descriptions of the system's design and operations, as well as the FMI's and participants' rights and obligations, so that participants can assess the risks they would incur by participating in the FMI.*

The rights and obligations of participants are embodied in BM&FBOVESPA's rulebooks and manuals, available from its website (see the list of normative documents provided under Key Consideration 1).

Additional information on costs, taxation, regulation, prices and parameters is also available from BM&FBOVESPA's website. Participants can access the BVMFNet portal to download the user's manuals for BM&FBOVESPA's systems and other supporting documents relating to systems and procedures.

In this manner participants can assess the risks they incur by participating in the FMI.

Key Consideration 3 - *An FMI should provide all necessary and appropriate documentation and training to facilitate participants' understanding of the FMI's rules and procedures and the risks they face from participating in the FMI.*

BM&FBOVESPA provides documentation and training to facilitate participants' understanding of its rules and procedures and the risks they incur by participating in its markets, systems and environments.

BM&FBOVESPA requires all participants' staff to be certified by the Operational Qualification Program (PQO) and to take tests periodically to obtain certification for the functions they perform or the area in which they operate.

BM&FBOVESPA regularly audits its participants to verify their ability to apply its rules and procedures.

BM&FBOVESPA also holds face-to-face meetings and seminars open to all participants, during which it clarifies new rules, procedures and systems, as well as courses offered by BM&FBOVESPA's Educational Institute. BSM offers lectures and meetings with participants to train them and clarify doubts about norms.

BM&FBOVESPA's Educational Institute is responsible for PQO certification and offers training, open courses and graduate courses on relevant topics of interest to professionals in the financial and capital markets.

Key Consideration 4 - *An FMI should publicly disclose its fees at the level of individual services it offers as well as its policies on any available discounts. The FMI should provide clear descriptions of priced services for comparability purposes.*

BM&FBOVESPA discloses via its website all the costs associated with each of the services it offers as well as its policies on any available discounts. The costs are presented in detail by type of fee associated with each service, contract and instrument, by type of event concerned, and by type of customer, where applicable.

Participants are notified formally (Circular Letters are sent by e-mail) of any changes to services and fees, including the dates on which changes will enter into force. Notification is given sufficiently in advance to give participants enough time to adapt their internal systems and procedures.

Key Consideration 5 - *An FMI should complete regularly and disclose publicly responses to the CPSS-IOSCO disclosure framework for financial market infrastructures. An FMI also should, at a minimum, disclose basic data on transaction volumes and values.*

The document containing information about BM&FBOVESPA in accordance with the CPMI-IOSCO framework and its quantitative complement are published on BM&FBOVESPA's website.

BM&FBOVESPA intends to update the document every two years or whenever material changes are made to its financial market infrastructures. The quantitative complement is set to be updated quarterly.

Information about transaction volumes and values, open interest and posted collateral, among other items, is also available from BM&FBOVESPA's website (http://www.bmfbovespa.com.br/en_us/services/market-data/reports/).

BM&FBOVESPA also discloses operational and financial information on its website, as well as all the information required by the applicable legislation, including Law 6404/76.

PRINCIPLE 24 – DISCLOSURE OF MARKET DATA BY TRADE REPOSITORIES

PRINCIPLE 24 – DISCLOSURE OF MARKET DATA BY TRADE REPOSITORIES: *A TR should provide timely and accurate data to relevant authorities and the public in line with their respective needs.*

Key Consideration 1 - *A TR should provide data in line with regulatory and industry expectations to relevant authorities and the public, respectively, that is comprehensive and at a level of detail sufficient to enhance market transparency and support other public policy objectives.*

BM&FBOVESPA publishes daily aggregated information about the inventory of transactions and the daily volume of transactions executed via its trading system, the financial assets and OTC derivatives registered with iBalcão, open interest, collateral posted to its clearinghouses, and reference prices (including the respective calculation inputs and methodologies).

The information is published in BM&FBOVESPA's Daily Bulletin, available from its website www.bmfbovespa.com.br, in Serviços, Market Data, Consultas, Boletim diário do mercado/Saiba Mais, and/or other sites or sections, such as:

- Information about iBalcão
www.bmf.com.br/bmfbovespa/pages/boletim1/Estatisticasibalcao.asp
- Reference prices and inputs:
http://www.bmfbovespa.com.br/en_us/services/market-data/historical-data/derivatives-market/search-by-trading-session/
- Pricing Manual:
http://www.bmfbovespa.com.br/pt_br/servicos/market-data/consultas/mercado-de-derivativos/metodologia/manual-de-aprecamento-da-bm-fbovespa/
- Exchange rates:
http://www.bmfbovespa.com.br/en_us/services/market-data/reports/foreign-exchange/indicators/reference-exchange-rates-tcr/

BM&FBOVESPA provides detailed information on positions and customer transactions to the regulatory authorities on a daily basis. Whenever requested by regulators, other information is provided, at specific times or regularly, in accordance with the requirement received.

Key Consideration 2 - *A TR should have effective processes and procedures to provide data to relevant authorities in a timely and appropriate manner to enable them to meet their respective regulatory mandates and legal responsibilities.*

Detailed daily information about the clearinghouses and iBalcão is provided regularly to BCB and CVM, in accordance with the specifications of each authority.

The data is supplied by BM&FBOVESPA's Information Services Unit using automated processes. Special requests for information are received and treated by this unit.

Data transmission is processed by specific systems according to procedures based on service level agreements to assure adequate and secure data delivery.

Key Consideration 3 - *A TR should have robust information systems that provide accurate current and historical data. Data should be provided in a timely manner and in a format that permits it to be easily analysed.*

BM&FBOVESPA uses automated straight-through processing (STP) to provide the above data for both the public and regulators. Its processes are regularly audited.

Information Services Unit centralises contacts and the transmission of information to regulators, as well as the publication of certain information on BM&FBOVESPA's website. The unit is responsible for the SI information system, which receives via batch-processes information from BM&FBOVESPA's other systems and organises it according to various disclosure requirements.

The processes run by Information Services Unit are considered mission-critical. They therefore have business continuity plans and regular execution tests.

Information Services Unit is responsible for the Investor's Electronic Channel (CEI) in two versions: one for investors, whereby they can access online information on their positions, account statements and notifications; and a version for participants available via BM&FBOVESPA's extranet for access to the positions held by customers under their responsibility.

VI – LIST OF PUBLISHED DOCUMENTS

LEGISLATION AND EXTERNAL REGULATION (CMN, BCB AND CVM)

BCB Circular 3057/01

www.bcb.gov.br/pre/normativos/busca/downloadNormativo.asp?arquivo=/Lists/Normativos/Attachments/47058/Circ_3057_v10_P.pdf

BCB Circular 3100/02

http://www.bcb.gov.br/pre/normativos/busca/downloadNormativo.asp?arquivo=/Lists/Normativos/Attachments/46930/Circ_3100_v8_L.pdf

BCB Circular 3743/15

http://www.bcb.gov.br/pre/normativos/busca/downloadNormativo.asp?arquivo=/Lists/Normativos/Attachments/48587/Circ_3743_v1_O.pdf

BCB Circular 3838/17

http://www.bcb.gov.br/pre/normativos/busca/downloadNormativo.asp?arquivo=/Lists/Normativos/Attachments/50400/Circ_3838_v1_O.pdf

BCB Communiqué 9419/02

www.bcb.gov.br/pre/normativos/busca/normativo.asp?numero=9419&tipo=Comunicado&data=19/04/2002

BCB Communiqué 12789/04

www.bcb.gov.br/pre/normativos/busca/normativo.asp?numero=12789&tipo=Comunicado&data=21/12/2004

BCB Communiqué 13750/05

www.bcb.gov.br/pre/normativos/busca/normativo.asp?numero=13750&tipo=Comunicado&data=29/09/2005

BCB Communiqué 26265/14

<http://www.bcb.gov.br/pre/normativos/busca/normativo.asp?numero=26265&tipo=Comunicado&data=7/8/2014>

BCB Communiqué 25097/14

www.bcb.gov.br/pre/normativos/busca/normativo.asp?numero=25097&tipo=Comunicado&data=10/01/2014

BCB Communiqué 25164/14

www.bcb.gov.br/pre/normativos/busca/normativo.asp?numero=25164&tipo=Comunicado&data=23/01/2014

BCB Communiqué 29078/16

www.bcb.gov.br/pre/normativos/busca/normativo.asp?numero=29078&tipo=Comunicado&data=4/2/2016

CVM Instruction 301/99

www.cvm.gov.br/export/sites/cvm/legislacao/instrucoes/anexos/300/inst301consolid.pdf

CVM Instruction 461/07

www.cvm.gov.br/export/sites/cvm/legislacao/instrucoes/anexos/400/inst461consolid.pdf

CVM Instruction 505/11

www.cvm.gov.br/export/sites/cvm/legislacao/instrucoes/anexos/500/inst505consolid.pdf

CVM Instruction 541/13

www.cvm.gov.br/export/sites/cvm/legislacao/instrucoes/anexos/500/inst541consolid.pdf

Law 4595/64

www.planalto.gov.br/ccivil_03/leis/L4595compilado.htm

Law 6385/76

www.planalto.gov.br/ccivil_03/LEIS/L6385compilada.htm

Law 6404/76

www.planalto.gov.br/ccivil_03/LEIS/L6404compilada.htm

Law 9613/98

www.planalto.gov.br/ccivil_03/leis/L9613compilado.htm

Law 10214/01

www.planalto.gov.br/ccivil_03/leis/LEIS_2001/L10214.htm

CMN Resolution 2687/00

www.bcb.gov.br/pre/normativos/busca/downloadNormativo.asp?arquivo=/Lists/Normativos/Attachments/47430/Res_2687_v1_O.pdf

CMN Resolution 2882/01

www.bcb.gov.br/pre/normativos/busca/downloadNormativo.asp?arquivo=/Lists/Normativos/Attachments/47065/Res_2882_v2_P.pdf

CMN Resolution 4373/14

http://www.bcb.gov.br/pre/normativos/busca/downloadNormativo.asp?arquivo=/Lists/Normativos/Attachments/48650/Res_4373_v2_L.pdf

CMN Resolution 4569/17

http://www.bcb.gov.br/pre/normativos/busca/downloadNormativo.asp?arquivo=/Lists/Normativos/Attachments/50376/Res_4569_v1_O.pdf

BYLAWS, CODES AND POLICIES

Code of Conduct

ir.bmfbovespa.com.br/fck_temp/26_82/file/CodigoDeConduta_20161223_ingl%C3%AAs.pdf

Bylaws

ir.bmfbovespa.com.br/fck_temp/26_90/file/20170622_Restated%20BYLAWS_divulga%C3%A7%C3%A3o%20site%20RI.pdf

Corporate Governance Guidelines

ir.bmfbovespa.com.br/fck_temp/26_2//CA-28-Annex1_CG_Guidelines.pdf

Disclosures and Securities Trading Policy Manual

ir.bmfbovespa.com.br/fck_temp/26_77/file/DISCLOSURES%20AND%20SECURITIES%20TRADING%20POLICY%20MANUAL_20161216.pdf

Internal Regulation of the Advisory Committees to the Board

ir.bmfbovespa.com.br/fck_temp/26_46/file/Internal%20Regulation%20for%20the%20Board%20Advisory%20Committees_2015.pdf

Audit Committee Internal Regulation

ir.bmfbovespa.com.br/fck_temp/26_48/file/Audit%20Committee%20Internal%20Regulation.pdf

Internal Regulation of the Board of Directors

ir.bmfbovespa.com.br/fck_temp/26_67/file/20160825_Internal%20Regulation%20of%20the%20Board%20of%20Directors_FINAL.pdf

Internal Regulation of the Executive Committee

ir.bmfbovespa.com.br/fck_temp/26_2//CA-28-Annex4_Internal_Regulation_of_the_Board_of_ExecutiveOfficers.pdf

Anti-Money Laundering and Counter Terrorism Financing Policy

ir.bmfbovespa.com.br/fck_temp/26_59/file/Pol%C3%ADtica%20Preven%C3%A7%C3%A3o%20errorismo%20Lavagem_ingl%C3%AAs20160513.pdf

Business Continuity Policy

ir.bmfbovespa.com.br/fck_temp/26_102/file/Pol%C3%ADtica%20de%20Continuidade%20de%20Neg%C3%B3cios_20170811_ingl%C3%AAs.pdf

Compliance Policy

ir.bmfbovespa.com.br/fck_temp/26_63/file/Pol%C3%ADtica%20de%20Compliance_ingl%C3%AAs20160503.pdf

Internal Controls Policy

ir.bmfbovespa.com.br/fck_temp/26_70/file/Politica%20de%20Controles%20Internos_ingl%C3%AAs_20160513.pdf

Normative Structure Policy

ir.bmfbovespa.com.br/fck_temp/26_62/file/Pol%C3%ADtica%20de%20Estrutura%20Normativa_ingl%C3%AAs20160513.pdf

Corporate Risk Management Policy

ir.bmfbovespa.com.br/enu/3609/CORPORATE%20RISK%20MANAGEMENT%20POLICY%202017%20.pdf

Operational Risk Policy

ir.bmfbovespa.com.br/fck_temp/26_61/file/Pol%C3%ADtica%20de%20Risco%20Operacional_ingl%C3%AAs20160513.pdf

Information Security Policy

ir.bmfbovespa.com.br/fck_temp/26_73/file/Pol%C3%ADtica%20de%20Seguran%C3%A7a%20da%20Informa%C3%A7%C3%A3o_ingl%C3%AAs_20160513.pdf

Policy on Related Party Transactions and other Conflict of Interest Situations

ir.bmfbovespa.com.br/fck_temp/26_70/file/Pol%C3%ADtica%20para%20Transa%C3%A7%C3%B5es%20com%20Partes_ingl%C3%AAs_20160513.pdf

FINANCIAL INFORMATION AND REFERENCE FORM

2Q17 Earnings Presentation

ir.bmfbovespa.com.br/enu/3526/2Q17%20-%20Earnings%20Presentation_11082017_VF.pdf

Annual Report 2016

ir.bmfbovespa.com.br/enu/3258/RA2016_BMFBOVESPA_EN.PDF

Reference Form 2016

ir.bmfbovespa.com.br/enu/3001/20161227_FRE2016_v11%20-%20Ingls_Guidance%20e%20Comit%20de%20TI_Limpa.pdf

NORMATIVE DOCUMENTS OF BM&FBOVESPA CENTRAL DEPOSITORY, BM&FBOVESPA CLEARINGHOUSE, FOREIGN EXCHANGE CLEARINGHOUSE AND IBALCÃO

BM&FBOVESPA Access Rules

www.bmfbovespa.com.br/lumis/portal/file/fileDownload.jsp?fileId=8A828D295048C0EF0150AFE610D81B8B

BM&FBOVESPA Access Manual

www.bmfbovespa.com.br/lumis/portal/file/fileDownload.jsp?fileId=8A828D295048C0EF0150AFE610AA1B71

BM&FBOVESPA Central Depository Rules

<http://www.bmfbovespa.com.br/lumis/portal/file/fileDownload.jsp?fileId=8AA8D0975E1ECB0E015E1FDD4C5F0945>

BM&FBOVESPA Central Depository Operating Procedures Manual

<http://www.bmfbovespa.com.br/lumis/portal/file/fileDownload.jsp?fileId=8AA8D0975E1ECB0E015E1FDD4C370923>

BM&FBOVESPA Clearinghouse Rules

<http://www.bmfbovespa.com.br/lumis/portal/file/fileDownload.jsp?fileId=8A828D2951C9C3770151ED975CC216A7>

BM&FBOVESPA Clearinghouse Operating Procedures Manual

www.bmfbovespa.com.br/lumis/portal/file/fileDownload.jsp?fileId=8AA8D09754177C0901553A7D42416C8C

BM&FBOVESPA Clearinghouse Risk Management Manual

www.bmfbovespa.com.br/lumis/portal/file/fileDownload.jsp?fileId=8AA8D0975C0EA94D015C879688D305F7

Glossary (referring to normative documents of BM&FBOVESPA Clearinghouse)

www.bmfbovespa.com.br/lumis/portal/file/fileDownload.jsp?fileId=8A828D294F270E45014FFB7C51783F77

BM&FBOVESPA Trade Repository Rulebook (iBalcão)

www.bmfbovespa.com.br/lumis/portal/file/fileDownload.jsp?fileId=8AA8D0975D3E7F69015D84A7F68D4518

Foreign Exchange Clearinghouse Rulebook

www.bmfbovespa.com.br/lumis/portal/file/fileDownload.jsp?fileId=8A828D294F270E45014FFB7C51633F5C

Foreign Exchange Clearinghouse Operating Procedures Manual

www.bmfbovespa.com.br/lumis/portal/file/fileDownload.jsp?fileId=8A828D295048C0EF0150AFED1F2A1E35

Foreign Exchange Clearinghouse Risk Management Manual

www.bmfbovespa.com.br/lumis/portal/file/fileDownload.jsp?fileId=8A828D294F270E45014FEFAF32124330

Novo Mercado Listing Rules

www.bmfbovespa.com.br/en_us/regulation/regulations-and-manuals/#item-2

Tesouro Direto Rules

<http://www.bmfbovespa.com.br/lumis/portal/file/fileDownload.jsp?fileId=8A828D294F270E45014FEFAF32F44408>

BM&FBOVESPA Technology Infrastructure Access Manual

www.bmfbovespa.com.br/lumis/portal/file/fileDownload.jsp?fileId=8AA8D09752D531A30152F1803559401F
