



“Developing resilient financial markets and strengthening the market intelligence tools for surveillance activities”

CEMLA - XII Meeting of Heads of Central Banking Operations

Juan Garcia*, Domestic Operations Division Director



BANCO DE MÉXICO

*The views expressed in this presentation are those of the presenter and do not necessarily represent those of the Bank of Mexico.

Market intelligence and surveillance activities at Banco de México

- **In order to support their policy and operational decisions, central banks need information from financial markets.** Collecting market intelligence for central banks is relevant for: market operations and financial market analysis, monetary policy analysis, reserve management and debt management operations.
- However, financial markets have evolved significantly over the past decade, becoming more specialized and, in some cases, facing structural change, leading to fragmentation and electronification.
- As a consequence, central banks nowadays cope with new challenges regarding their market intelligence and surveillance activities. **In particular, operational activities have become more complex and frequent, and their design has incorporated new elements that were inexistent few years ago.** Banco de México, through the Domestic Operations Directorate, performs several market intelligence activities, both quantitative and qualitative. These activities aim to generate and provide relevant information for the Board of Governors, so that it can be used as an input for their decision making process regarding operations in financial markets.
- Over the past years, the analysis provided to the Board of Governors, both qualitative and quantitative, has become more rigorous and sophisticated, adapting to the constant development observed in financial markets. As a consequence, their insight has become more deep, making the implementation of several operational activities more efficient and targeted.

Index

1 **Market intelligence tools for surveillance activities**

2 **Developing resilient financial markets**

Market intelligence tools for surveillance activities

- As time progresses, information from markets has become more segregated and difficult to collect due to technological developments, innovation, internalization of trades, increase in the different types of market participants active in a specific market, compliance considerations, regulation, among others.

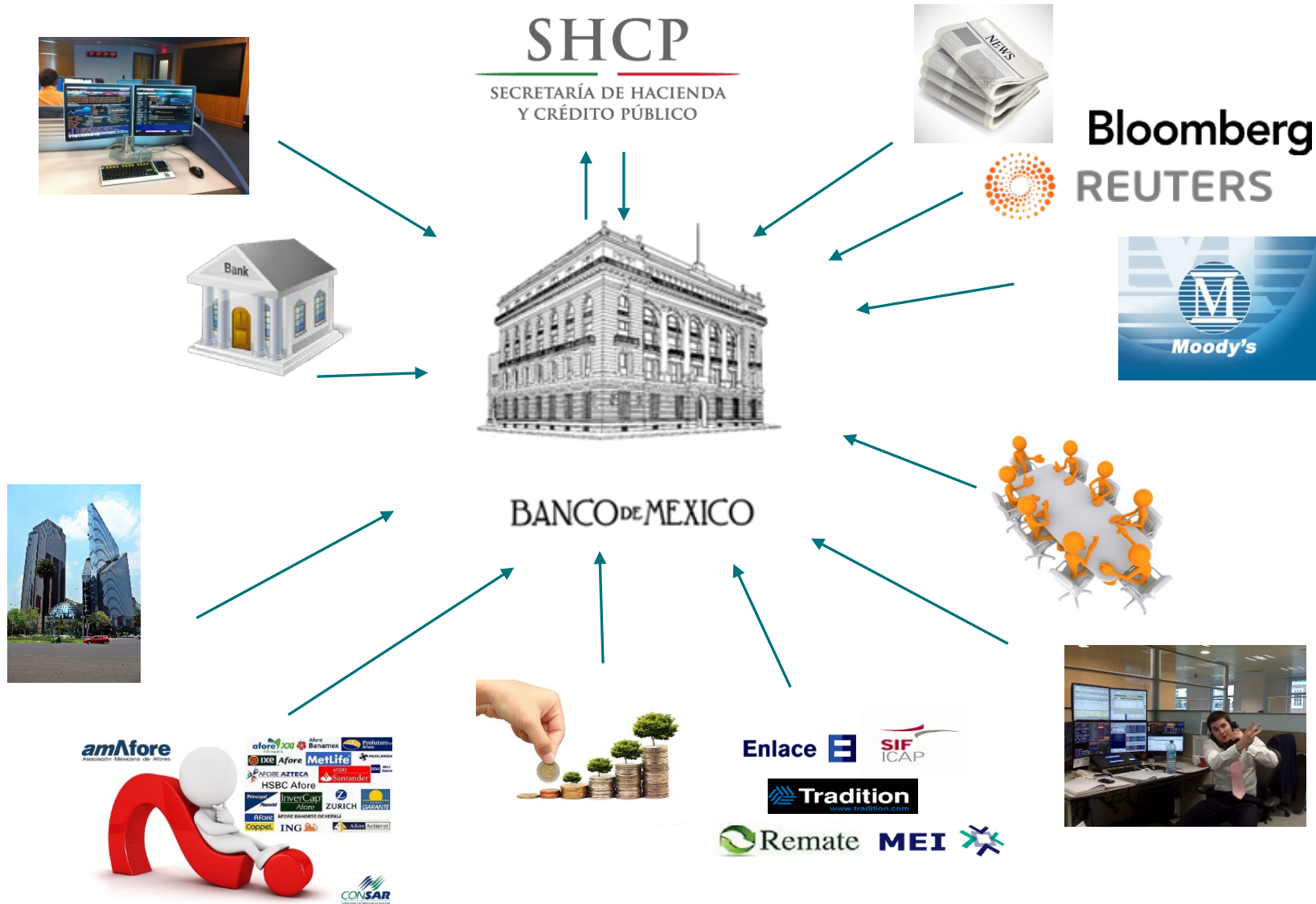
- For the Bank of Mexico, Market Intelligence (MI) is defined as:

All information gathered from market participants, through different means, in order to assess market conditions and developments and use this information in the implementation of FX and monetary policy, as well as for carrying out government debt auctions on behalf of the Federal Government, investment of International Reserves, and any other operational consideration that the Bank may face.

MI = quantitative information + qualitative information = financial market analysis

- Understanding financial markets in order to make decisions,
 - Collecting qualitative information through interaction with market participants,
 - Collecting quantitative information through trades executed by market participants, and
 - Statistical information analysis.
- Focus at Banco de México has shifted to more quantitative analysis with the information gathered through MI practices and the search to expand the sources and quantity of information.

Market Intelligence at Bank of Mexico



TRADING NETWORKS

EBS Market

FX Connect®

NEX Exchange

CitiVELOCITY™

Autobahn

REFINITIV™

HOTSPOT







A BATS GLOBAL MARKETS COMPANY

SPOTEX
FOREIGN EXCHANGE ECN

LMAX™
EXCHANGE

EURONEXT FX

Market Intelligence at Bank of Mexico

-  Direct monitoring
-  Monitoring through commercial banks
-  Monitoring through other MPs
-  Monitoring through payment systems
-  Monitoring through platforms/brokers
-  Market information (interest rates, amounts, maturity, etc.)

SHCP
SECRETARÍA DE HACIENDA Y CRÉDITO PÚBLICO

BANCO DE MÉXICO

Commercial and development banks



Other MPs



Brokerage Houses



Brokers

Enlace

THOMSON REUTERS

Bloomberg

Financial media platforms

EBS Market
FX Connect®

EURONEXT FX
Electronic platforms



Pension funds



Mutual Funds

Market Intelligence at Bank of Mexico

- There are several fronts by which MI is currently collected:

| MI Activities | Periodic basis | | | | | | | Ad-hoc basis |
|---|----------------|--------|---------|-----------|-------------|--------|-------|--------------|
| | Daily | Weekly | Monthly | Quarterly | Semi-annual | Annual | Other | |
| Local and international counterparties from sell-side and buy-side market participants, | X | | | | | | | X |
| Arrangement of meetings or conference calls with several investors, both local and international | | X | | | | | | X |
| Utilizing the network of former employees that work both in the public and private sector, | X | | | | | | | X |
| Meetings with primary dealers, local committees, exchanges, CCPs, etc., | | | X | X | | | X | X |
| Outreach to new types of contacts that are becoming relevant in the current market structure (i.e. electronic platforms). | | | | | | | | X |

Market Intelligence at Banco de México

Banco de México has two in-house tools for monitoring and analyzing financial markets.

These tools have different purposes: the Blackboard serves as a real-time monitoring tool, while the Market Intelligence Hub acts as an analysis tool focused in timely and historic indicators.

BLACKBOARD

Miércoles 09 de Diciembre de 2020
MERCADO DE CAMBIOS

| | I | II | III | IV | V | VI |
|-------|----|----|-----|----|---|----|
| 10:30 | -3 | 0 | 33 | 0 | 0 | 30 |
| 11:30 | | | | | | |
| 12:30 | | | | | | |
| 13:30 | | | | | | |
| FINAL | | | | | | |

| Divisa | Último hecho | % |
|--------|--------------|-------|
| MXN | 19.8810 | -0.46 |
| EUR | 1.2076 | -0.23 |
| GBP | 1.3385 | 0.22 |
| JPY | 104.30 | -0.13 |
| BRL | 5.1611 | -0.80 |

Tipo de cambio intradía

| Gerre | Apertura | Gerre | Fix |
|------------|----------|------------|---------|
| 08/12/2020 | 19.7800 | 09/12/2020 | 19.7600 |

MERCADO DE DINERO Y ACCIONARIO

| Plazo | Cierre | Último Hecho | Puntos Base |
|-------|--------|--------------|-------------|
| 1 M | 4.25 | 4.25 | 0 |
| 3 M | 4.29 | 4.29 | 0 |
| 6 M | 4.30 | 4.30 | 0 |
| 1 A | 4.36 | 4.36 | 0 |
| 3 A | 4.40 | 4.40 | 0 |
| 5 A | 4.87 | 4.84 | -3 |
| 10 A | 5.62 | 5.61 | -1 |
| 20 A | 6.48 | 6.43 | -5 |
| 30 A | 6.79 | 6.75 | -4 |
| 3 A | 1.20 | 1.20 | 0 |
| 10 A | 2.03 | 2.03 | 0 |
| 30 A | 3.07 | 3.07 | 0 |

| | Anterior | Actual |
|------------------|----------|--------|
| Gubernamental | 4.2700 | |
| Bancario | 4.2900 | |
| TIIE Fondo 1 día | 4.2700 | |

| Plazo | Cierre | Último Hecho | Puntos Base |
|-------|--------|--------------|-------------|
| 3 M | 4.46 | 4.46 | 0 |
| 2 A | 4.36 | 4.34 | -2 |
| 5 A | 4.82 | 4.82 | 0 |
| 10 A | 5.50 | 5.46 | -4 |

| Plazo | Cierre | Último Hecho | Puntos Base |
|--------|--------|--------------|-------------|
| FONDEO | 0.08 | 0.08 | 0 |
| 2 A | 0.15 | 0.15 | 0 |
| 5 A | 0.40 | 0.40 | 0 |
| 10 A | 0.93 | 0.94 | 1 |
| 30 A | 1.68 | 1.69 | 1 |

| Índice | Valor | % Diario | Fecha |
|-----------|-----------|----------|------------|
| BMV | 42,838.59 | 0.60 | 09/12/2020 |
| BIVA | 879.19 | 0.76 | 09/12/2020 |
| SBP | 3,694.46 | -0.21 | 09/12/2020 |
| FTSE | 6,575.70 | 0.26 | 09/12/2020 |
| EUROSTOXX | 395.14 | 0.38 | 09/12/2020 |
| BRENT | 48.77 | -0.14 | 09/12/2020 |
| Oro | 1,843.83 | -1.51 | 09/12/2020 |

Market Intelligence Hub

Análisis de Mercados Nacionales

Índice

- Mercado de Renta Fija
- Mercado Cambiario
- Mercado Accionario
- Política Monetaria
- Pujot
- Reporte de Cierre

Market Intelligence at Banco de México

Banco de México's tools: Timeline

The Blackboard is connected to Reuters and is now automatically fed with "real-time" data

Release of a multiplatform Blackboard, available to the top management 24/7 from any device, anywhere

First dashboards and indicators published in the Hub.

- Participation in the BIS Innovation Hub workgroup for sharing experience and best practices.
- Continued developing new tools for monitoring the FX market- "Market Tracker".
- Improving technological infrastructure.

90's

2007

2008-2017

2018

2018

2019

2020

2021-2022

Banxico develops a "real-time" monitoring tool for the Board of Governors, which was updated manually with certain periodicity throughout the day. This tool was called "The Blackboard"

Constant improvements and platform updates

Analysis department automates processes and creates a Datawarehouse as the beginning step towards the Market Intelligence Hub

Creating more dashboards and indicators in order to meet user's need of information.

Market Intelligence at Banco de México

Main characteristics of Bank of Mexico's tools

BLACKBOARD

- ✓ Data Streaming processing platform
 - ✓ Structured data stream
- ✓ **Monitoring tool** for FX and Fixed income markets
- ✓ **Real time** financial data
 - ✓ FX: Refinitiv and Banks operations.
 - ✓ Fixed income: brokers for nominal, real rates and IRS
 - ✓ High frequency updates; the tool refreshes every 5 seconds. Mobile app refreshes every minute.
- ✓ Intra-day data storage. At the end of each day, the data base is erased (daily average: 50,000 data points)
- ✓ Local cloud with storage servers
- ✓ Closed source tools

Market Intelligence Hub

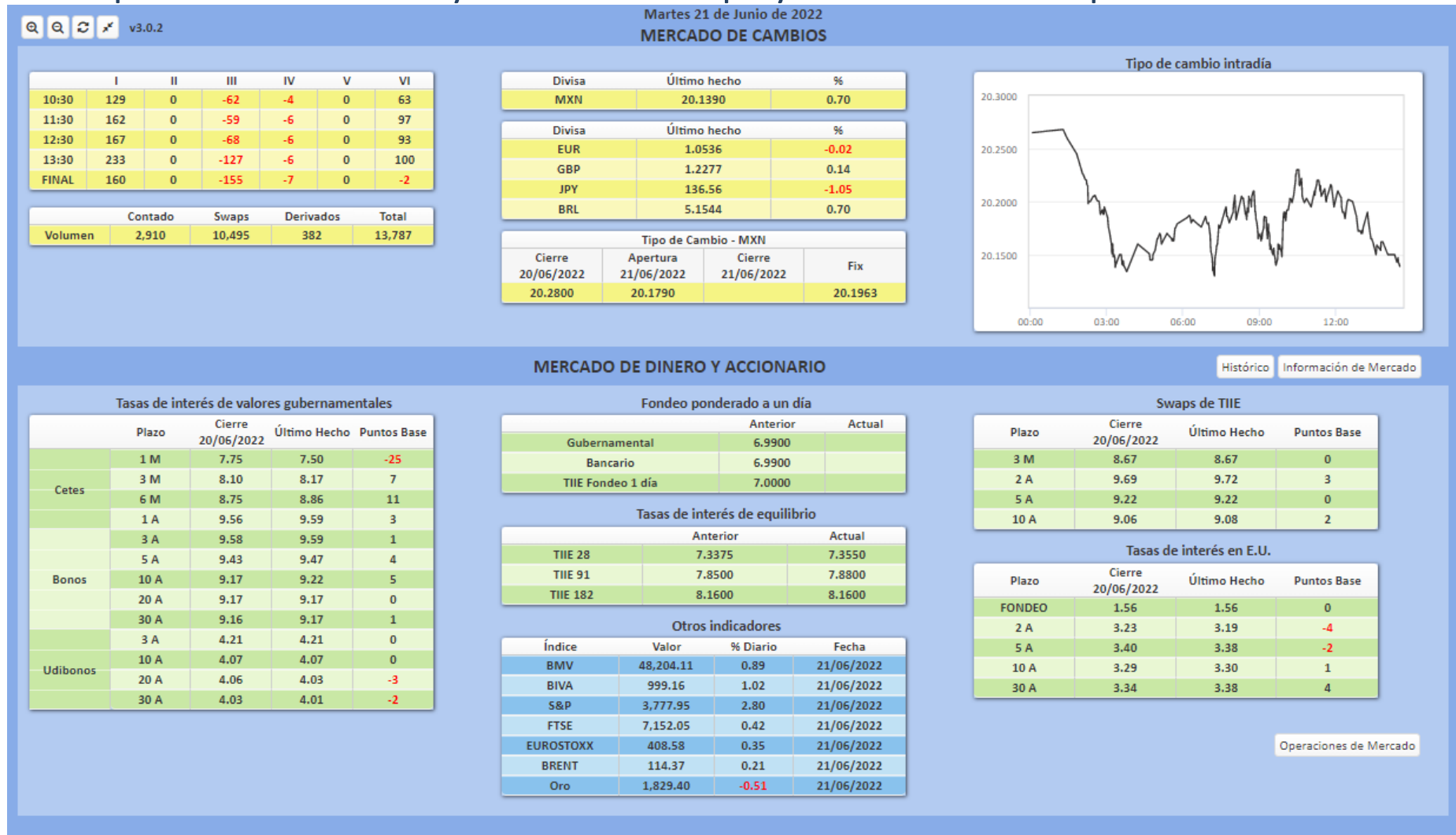
- ✓ Data Streaming processing platform
 - ✓ Structured data stream
- ✓ **Analysis tool** for FX and Fixed income markets
- ✓ **End of day** financial data
 - ✓ FX: Refinitiv and Banks operations
 - ✓ Fixed income: brokers for nominal, real rates and IRS
 - ✓ Banxico's databases
 - ✓ Data is exploited and transformed into indicators
- ✓ Complete data storage (current data points 30 million)
- ✓ Local cloud with storage servers
- ✓ Closed source tools
- ✓ Dashboards for data visualization
- ✓ Historical Data downloads

Market Intelligence at Banco de México: Blackboard System

- The Blackboard System is an in-house monitoring system that refers to a single screen viewing display that portrays relevant information about the ongoing performance of financial markets during the day (mainly Mexican financial instruments). The system's main user is the Board of Governors at Banco de México and the information included is as follows:
 - Domestic Markets:
 - FX market
 - Domestic market flows (including any FX trades undertaken by the Bank of Mexico in the market)
 - Exchange rate current and historical data
 - Fixed Income market
 - Open Market Operations (OMOs) results
 - Current market data (i.e. Zero-coupon bonds, nominal and real rates government bonds, reference rates, and IRS)
 - Stock market
 - Foreign Markets:
 - FX
 - US Fixed Income market
 - Stock market
 - Commodities market

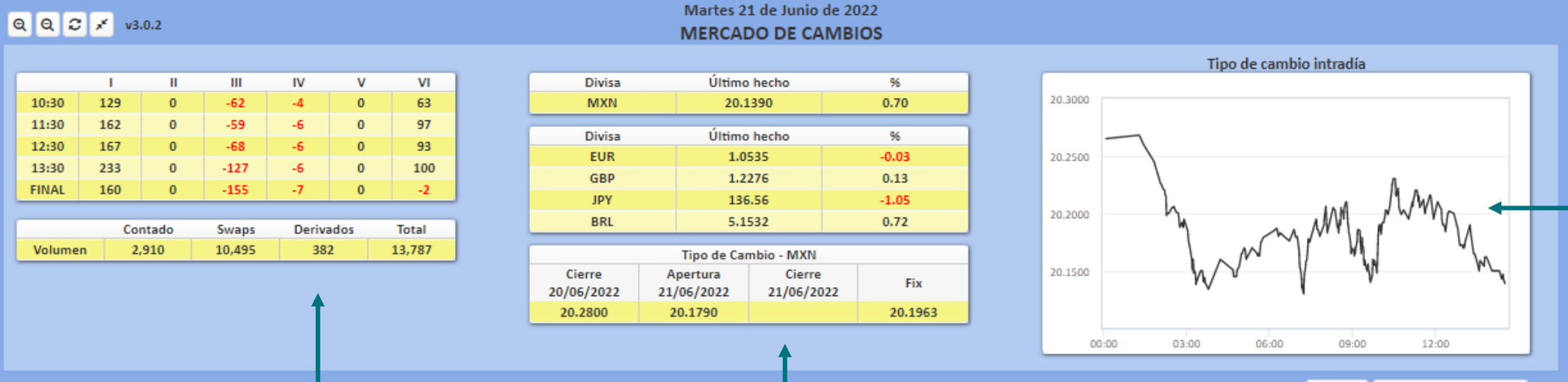
Market Intelligence at Banco de México: Blackboard System

- The main source of information for the Blackboard System is Refinitiv and it entails real-time data
- The system updates automatically and can be displayed in both desktop and mobile devices



Market Intelligence at Banco de México: Blackboard System

- The information shown in the system about the FX market is as follows:



FX market volume and flows

This information is received through Banxico's Operations Reporting System. The data is segmented every hour, starting at 10:30 a.m., and is processed in real-time. It includes Mexican peso flows traded by local banks and is divided into spot, swaps and derivatives trades.

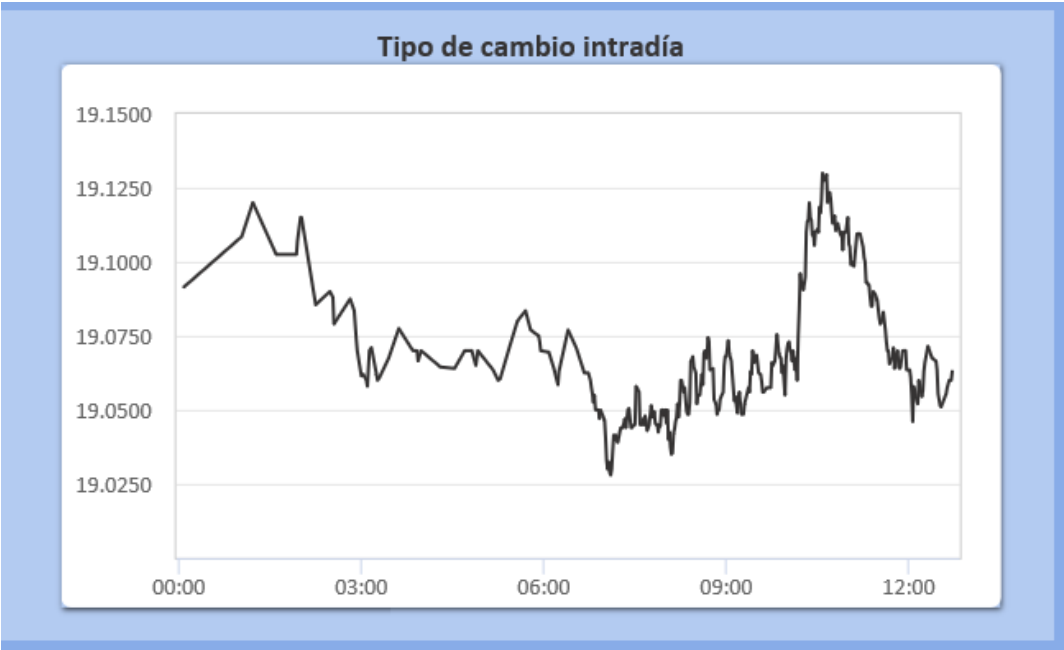
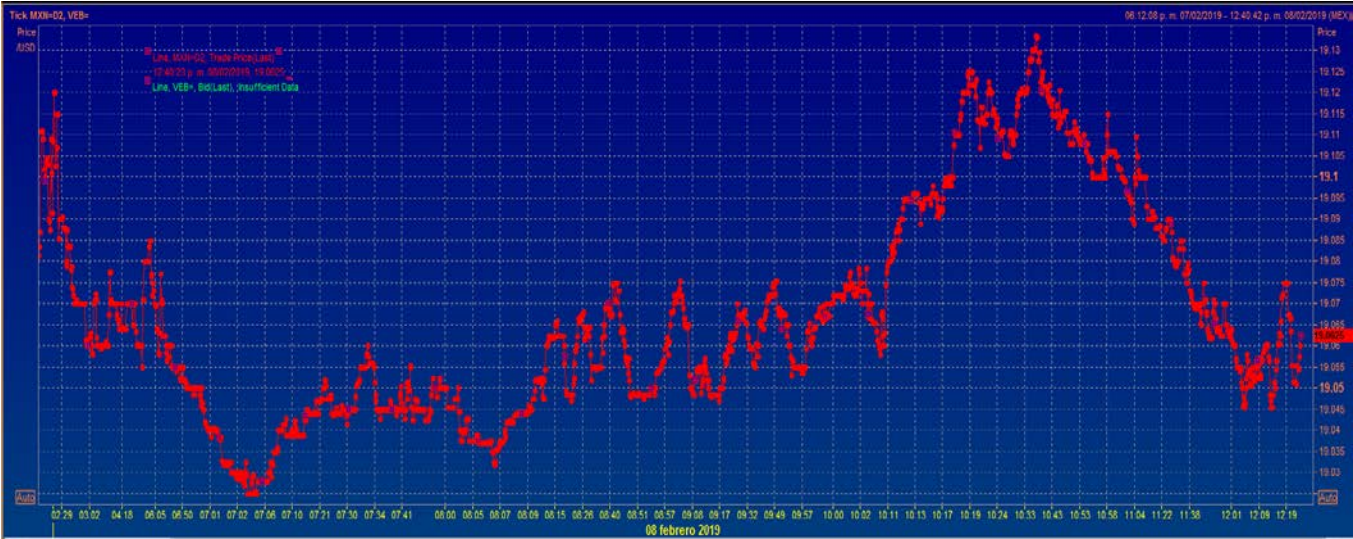
Other exchange rates

- Close:** The system displays automatically the first trade after 3:00 p.m.
- FIX:** Reference exchange rate estimated and published by the Bank of Mexico. The internally developed system Sisfix, feeds this information automatically
- Open:** The system displays automatically the first trade starting at 6:00 a.m.

Market Intelligence at Banco de México: Blackboard System

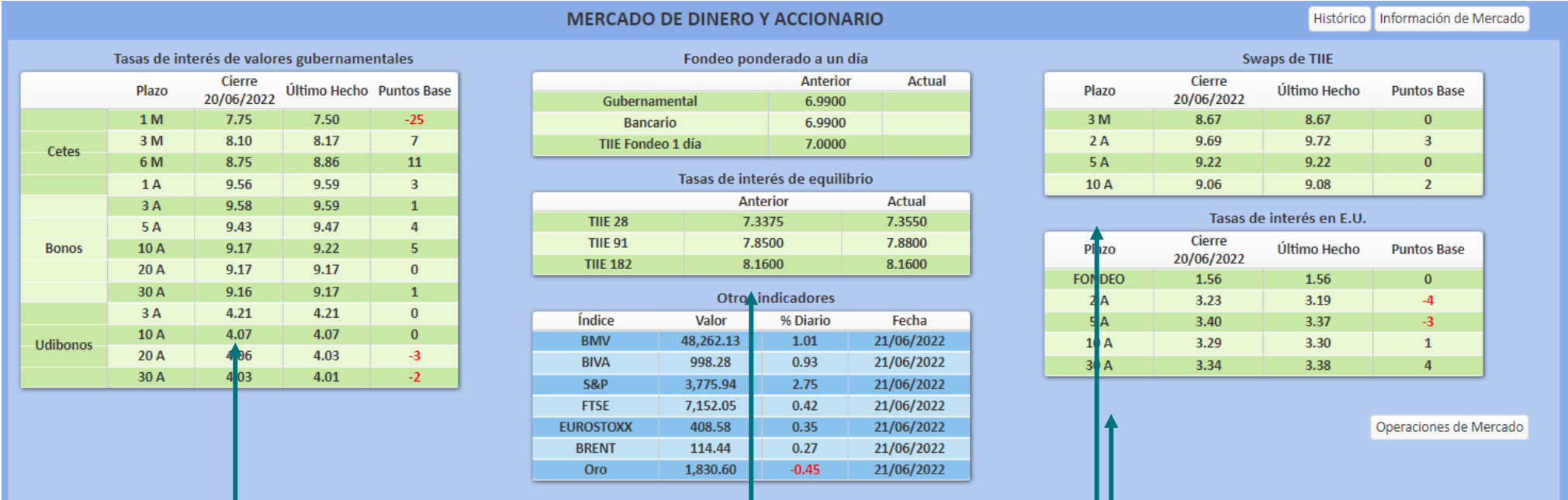
- It is worth noting that the system immediately stores the exchange rate data associated to all trades executed for USD/MXN and replicates the graph provided by Refinitiv. Furthermore, the system displays in real-time the current exchange rate and its percentage change.

| Divisa | Último hecho | % |
|--------|--------------|------|
| MXN | 19.0520 | 0.14 |



Market Intelligence at Banco de Mexico: Blackboard System

- The information about the local Fixed Income market is as follows:



Real-time updates on government interest rates' performance

The information of the Interbank Equilibrium Interest Rate (TIIIE) is shown here. The internally developed system, TIIEBAN, sends this information automatically

Real-time rate levels of the TIIIE swap market and US Government bonds.

Blackboard

Data sources



In-house communication protocols for centralizing data



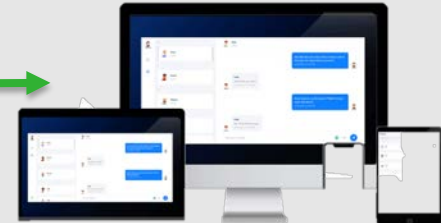
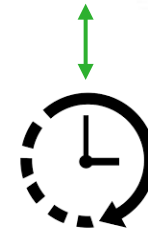
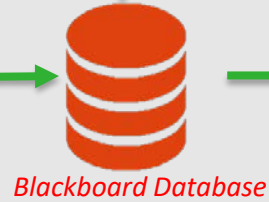
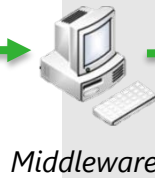
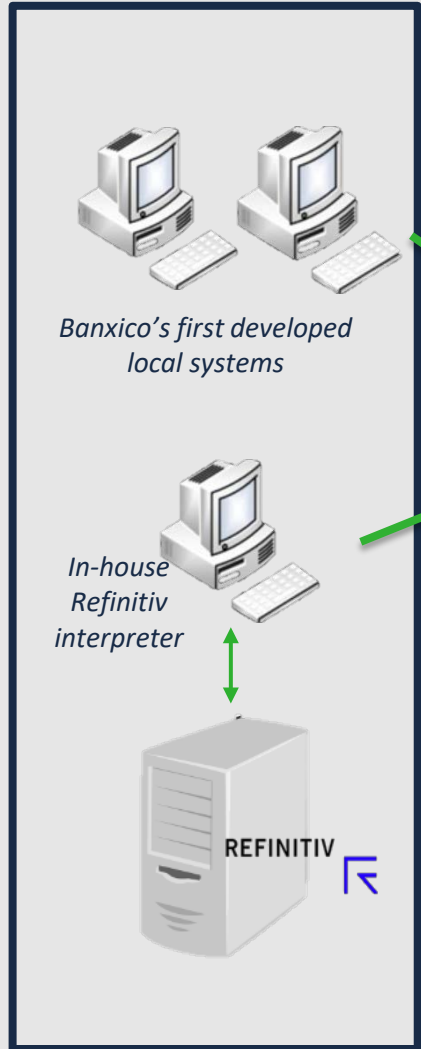
Storing data



Web server managing client requests



High frequency data available for users

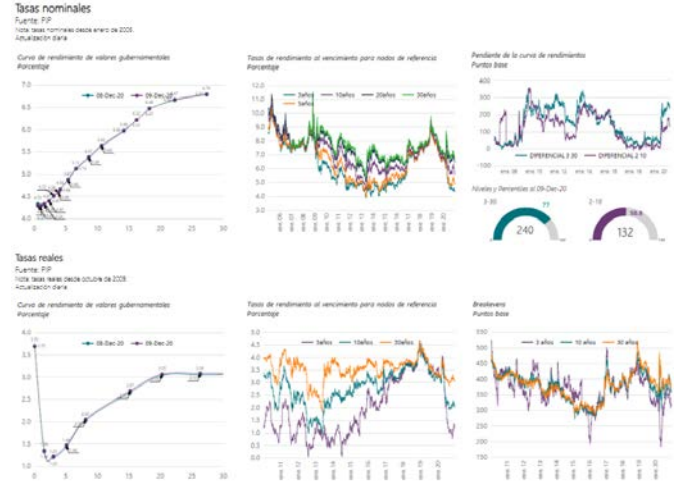


Market Intelligence at Banco de México: Market Intelligence Hub

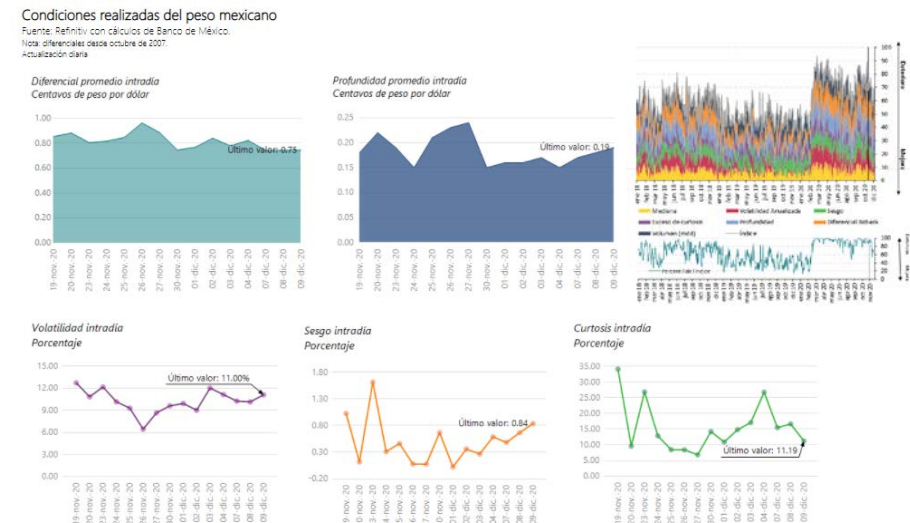
- Technological tool that allows different areas of the Bank of Mexico to consult and download visualizations and analysis dashboards in a timely and automatic manner.



Fixed Income Dashboard



FX Trading Conditions Dashboard



Market Intelligence at Banco de México: Market Intelligence Hub

An innovative, centralized, automatic and secure tool that provides access to indicators and relevant analysis for decision making.

Benefits include:



Information available in a **timely manner**



Centralized data



Information **available for sharing** with different areas of the Bank



Visualization of **market indicators** with more than 15 years of history available



Information **safely stored** in institutional databases

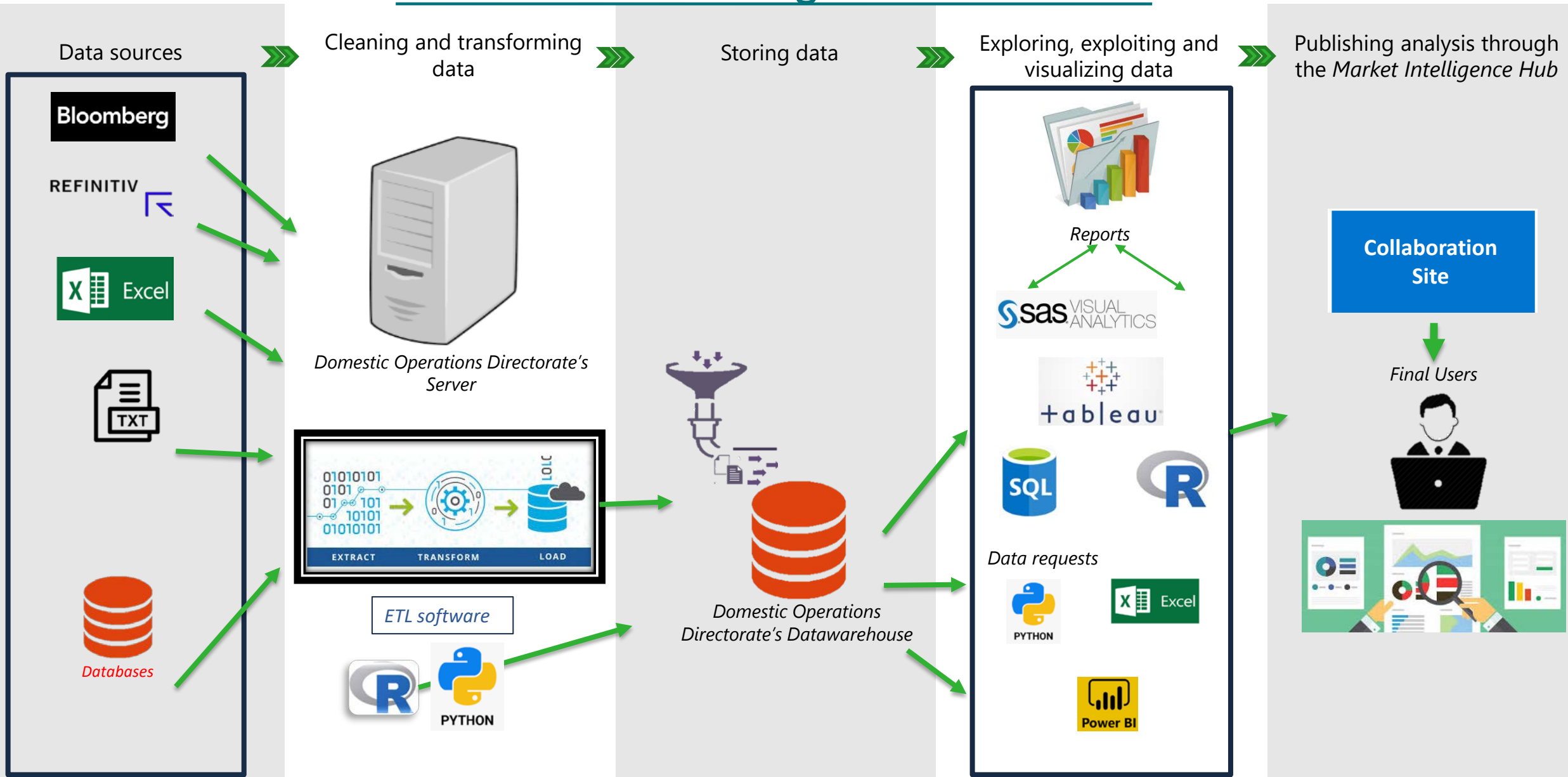


Portal with **access control** and institutional **security measures**



Adaptability to meet user needs.

Market Intelligence Hub



Examples of information available on the Market Intelligence Hub

Fixed Income Market

Indicators, reports and statistics related to fixed income instruments in the Mexican market

Historical data

Yields

Breakevens

Instruments On the Run

Yield curve slope

Dashboards

Trading conditions

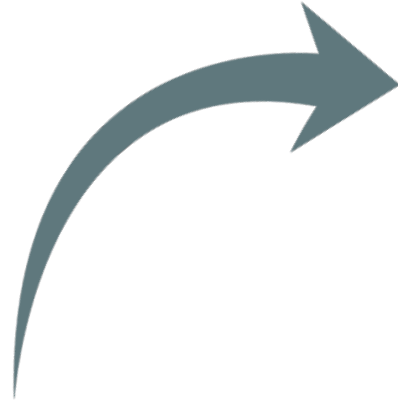
Trading through brokers

Trading conditions Index

Historical analysis

Market Makers

Monthly report



Trading through brokers

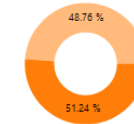
Datos de operación y participantes del mercado al 12/10/2021 en millones de pesos

Fuente: Brokers

Nota: datos desde el 4 de enero de 2016.

Actualización diaria

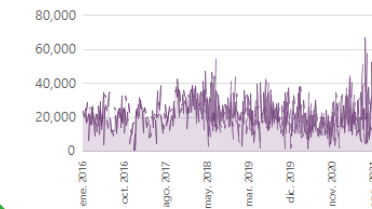
Legenda: ■ Compra/Venta ■ Reportos



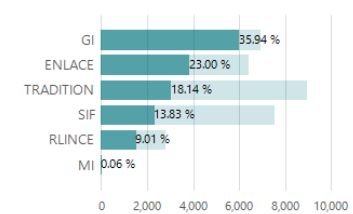
16,729 millones de pesos operados en 244 operaciones de compra/venta
(promedio 20 días 18,629mp).

15,922 millones de pesos operados en 68 operaciones de reporto

Monto Total operado por tipo de operación

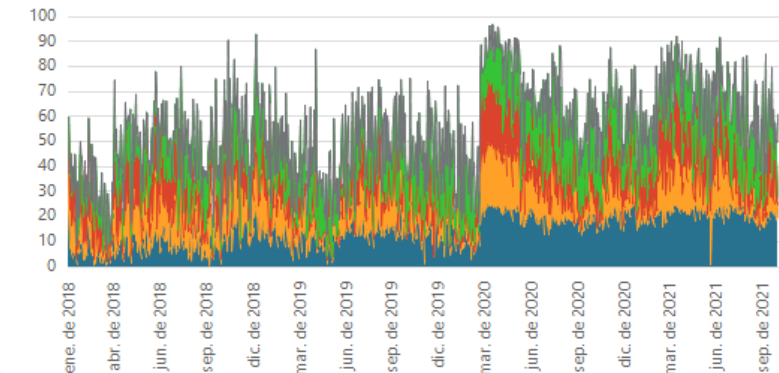


Participación de mercado por Broker



Trading conditions Index (percentile)

— Índice ■ Volumen ■ Volatilidad ■ Profundidad ■ Liquidez



Examples of information available on the Market Intelligence Hub



Indicators, reports and statistics related to the Mexican Peso and other currencies

Historical data

Fix

Carry to risk

Average bid-ask spread

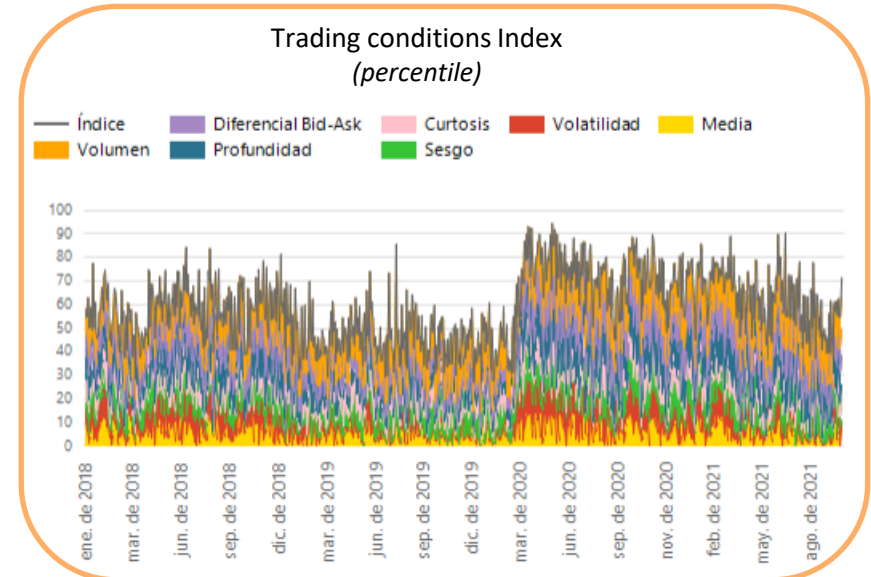
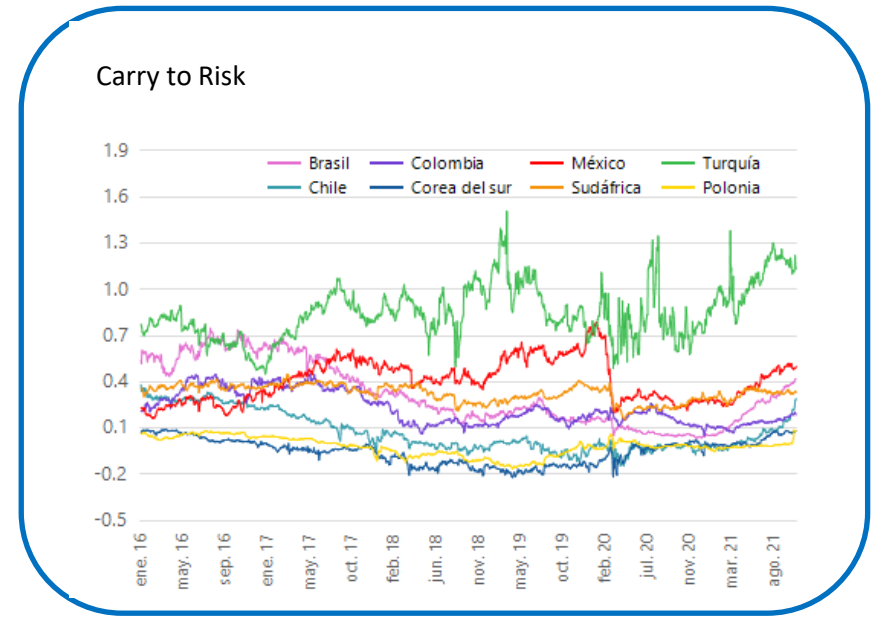
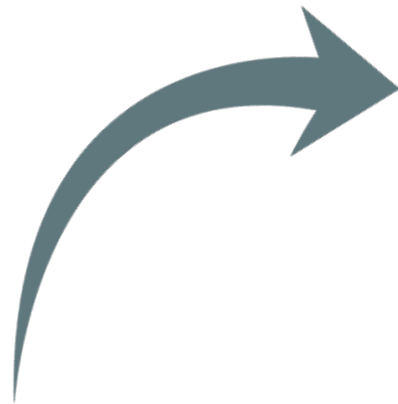
Dashboards

Trading conditions

Implicit conditions

Trading conditions Index

Trading volume and positioning



Examples of information available on the Market Intelligence Hub



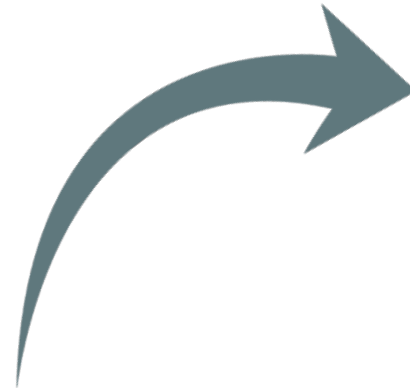
Indicators, reports and statistics related to Monetary Policy

Historical data

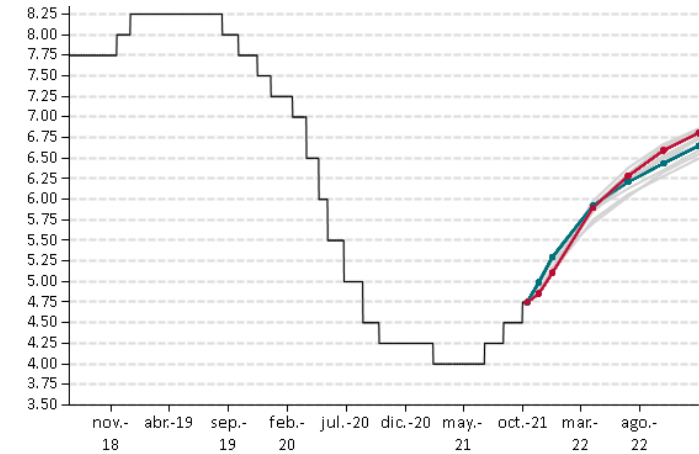
Rates implicit in the IRS curve

Reports

MP Statements analysis



Implied rates in the IRS curve
Percentage



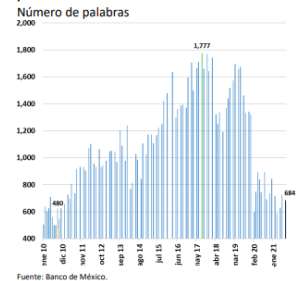
Monetary Policy Statement Analysis

Gráfica 1: Conteo del contenido del comunicado por sección

| Número de palabras | Contexto internacional | Mercados y economía | π^{obs} | π^e | σ_{π} | Justificación | Total |
|---------------------|------------------------|---------------------|-------------|---------|----------------|---------------|-------|
| Ago. 2021 | 105 | 96 | 24 | 111 | 77 | 271 | 684 |
| Cambio en palabras: | (-17) | (-17) | (-2) | (+27) | (-12) | (-23) | (-44) |
| Jun. 2021 | 122 | 113 | 26 | 84 | 89 | 294 | 728 |

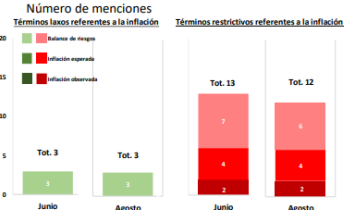
Fuente: Banco de México.
Nota: La sección de justificación incluye: justificación y decisión. La sección de contexto internacional incluye: Estados Unidos, Europa y países emergentes. La sección mercados y economía incluye: mercados financieros y economía de México. La sección π^{obs} incluye: la inflación observada. La sección π^e incluye: la inflación esperada. La sección σ_{π} incluye: el balance de riesgos.

Gráfica 2: Histórico del contenido del comunicado por sección



Fuente: Banco de México.

Gráfica 3: Menciones a términos restrictivos y laxos de inflación en el comunicado



Fuente: Banco de México.
Nota: En el conteo se consideran los términos relacionados con mayor inflación tales como: "inflación", "inflación esperada", "inflación observada", "incremento en los precios", "evolución deflacionaria", "chocó en los precios", etc. Así como los riesgos a la alza identificados en la sección de balance de riesgos.

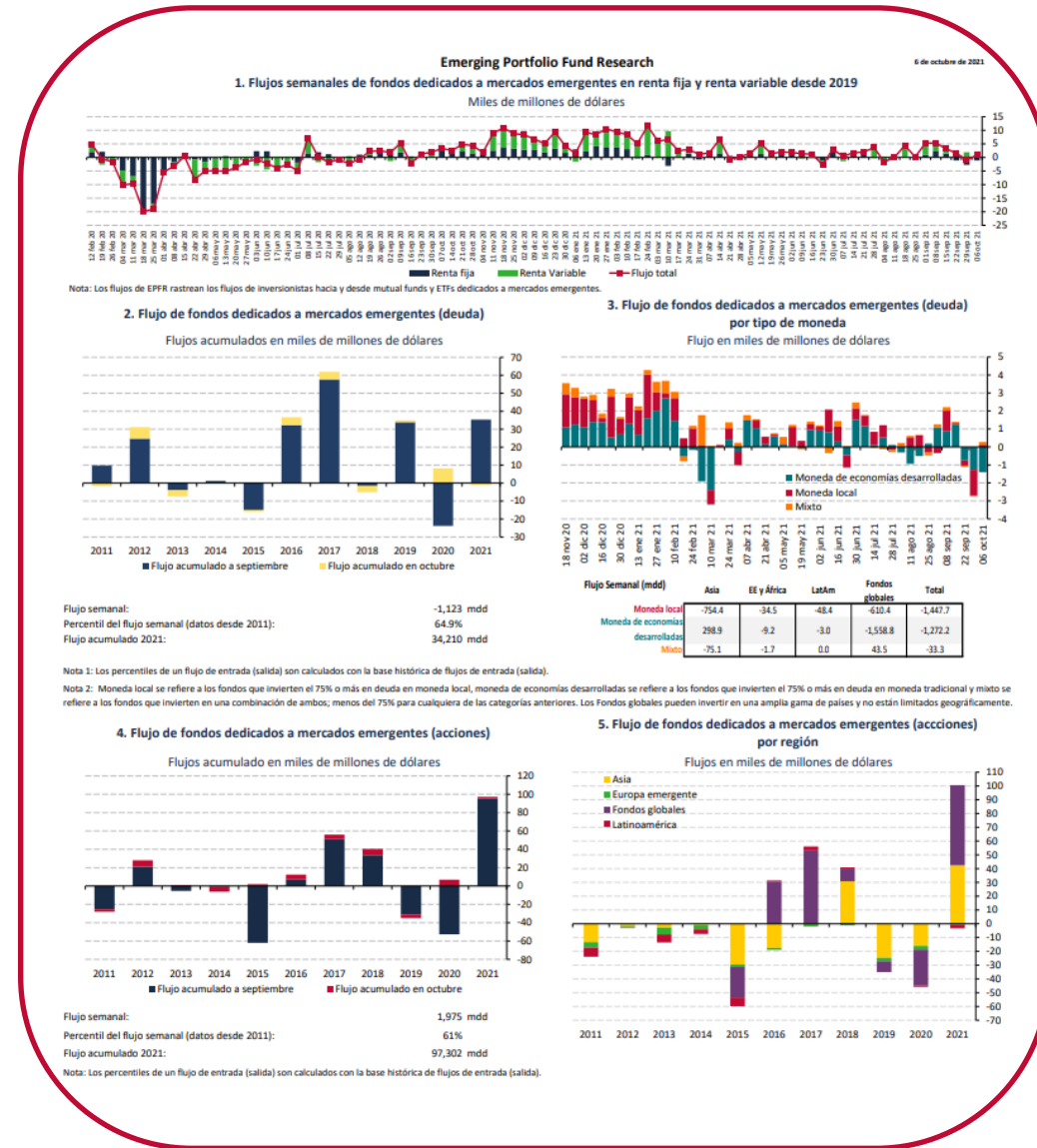
Examples of information available on the Market Intelligence Hub



Indicators, reports and statistics related to flows into Mexico and Emerging Markets

Reports

EPFR Report



Examples of information available on the Market Intelligence Hub



Indicators, reports and statistics related to the equity market

Quarterly Reports

Q3 2021 Report

Q4 2021 Report

Q1 2022 Report

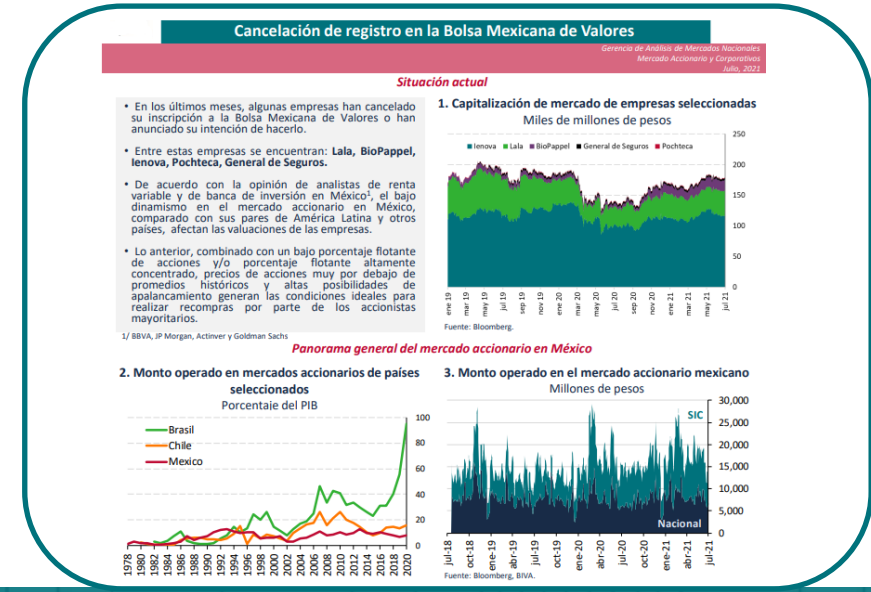
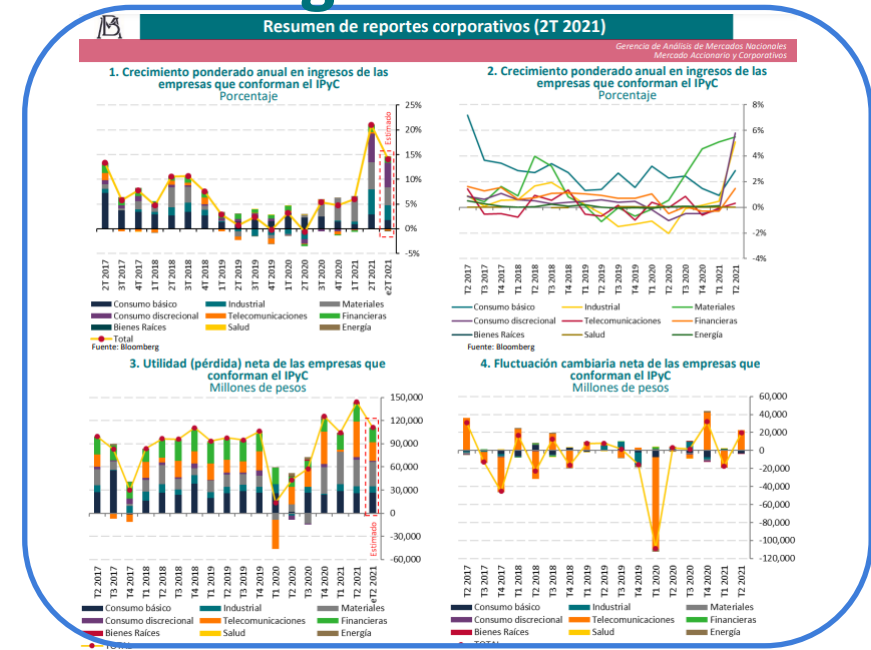
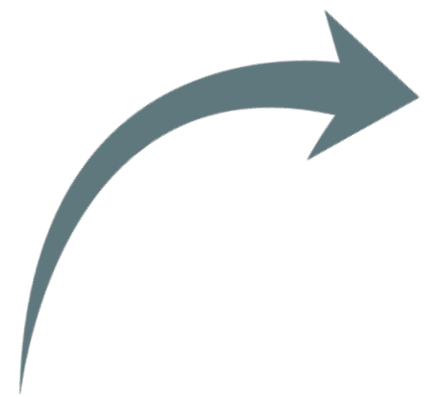
Report on listings in the Mexican Stock Exchange

Pemex

Q1 2022 Report

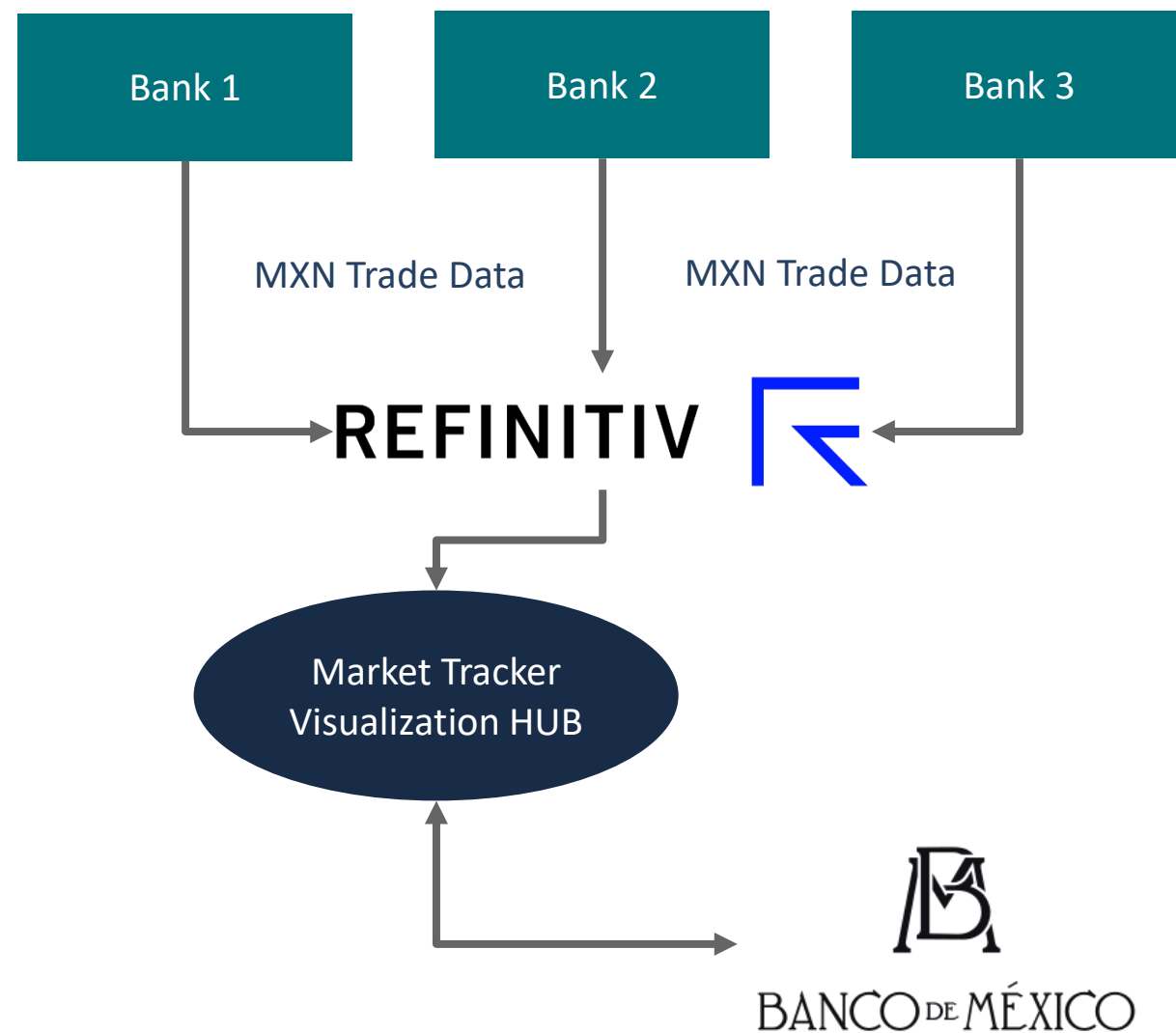
Refineries and Gas Stations

Fiscal Policy



Market Intelligence at Banco de México: Market Tracker

- This tool will enhance current monitor capabilities.
- Automated real-time data feed to the Central Bank that will detail all MXN trades executed via electronic platforms, including offshore transactions.
- Refinitiv's Market Tracker was selected as the preferred solution and interface for the ongoing project
 - 90% of FX electronic platforms trading MXN are already connected to Refinitiv's post-trade data systems
- Key MXN liquidity contributors in the form of Single Bank Portals are currently into conversations to participate in the project
- Development and implementation projected for 2Q2021



Index

1

Market intelligence tools for surveillance activities

2

Developing resilient financial markets

From the juncture of COVID, to the structural development of markets

- The COVID-19 pandemic inflicted an unprecedented shock to the global economy and world financial markets. Emerging market economies suffered historically large capital outflows and abrupt movements in financial asset prices in early 2020.
- The policy response was forceful, including massive monetary stimulus and large packages of fiscal measures to stimulate the economy. Banco de México addressed the pandemic by working on four different dimensions: monetary policy, liquidity provision, credit channels and fostering an orderly behavior of financial markets.
- The extraordinary measures to tackle the crisis had a positive effect from the beginning, by providing liquidity and becoming an important backstop for financial markets.
- As the worst of the crisis was left behind, the focus shifted to an orderly winding-down of the extraordinary facilities, and staying the course towards the development of liquid and resilient financial markets.

From the juncture of COVID to the structural development of markets

- Looking past COVID-19, the focus will be the further development of our financial markets.



Working group on **Derivates**



Working group on **Repo Operations**



Working group on **Securities Lending**



Working group on **Inflation Linked Securities**



Working group on **Corporate Debt**



Working group on **Market Infrastructure (CCP)**



Working group on **Libor Transition**



Working group on **Capital Markets**

- The long-term challenge for EMEs remains: building liquid and resilient financial markets that facilitate the price-discovery process, and work as shock-absorbers during financial turbulence. Doing so will aid EMEs in preventing and mitigating crisis, and in promoting long-term financial stability.
- In that regard, Banco de México has an ambitious agenda to further develop its financial markets in the coming years.

Final Remarks

- There is no doubt that policy making in central banks has become more challenging. The constant and rapid innovation in financial markets requires quick adaptative capacities from the Central Bank staff, while the structural shock that Covid-19 pandemic represented, represents a hurdle for market development and depth.
- However, Banco de México has dedicated significant resources to strengthen its market intelligence and analytical capacities in order to efficiently surveil markets. In that sense, the more information that the Central Bank can collect, the better and deeper the analysis that it can perform on financial markets.
- Nevertheless, it is important to develop the correct tools in order to disseminate and analyze this information in a efficient and quick way, so that it is timely useful for the decision making process for the people involved in the operational activities. The ideal surveillance tool should be able to provide real-time analysis and visualizations and also interact with the end-of-day or intraday historical indicators in order to notify the users any relevant deviations in the market.
- In that sense, Banco de México has developed the three tools described (Blackboard, Hub and Market Tracker) to complement each other and have analytical resources in a broad spectrum.
- The working groups that emerged from the Covid-19 crisis have helped to identify the specific points that need to be developed in each financial market in a more efficient way. Since the working groups are integrated by authorities, clients, banking sector and price providers, the proposals for market development that have emerged from these groups are more targeted.
- As for additional market development activities, Banco de México will be focused on strengthening the market infrastructures in order to foster the growth, liquidity and dept in financial markets



BANCO DE MÉXICO

www.banxico.org.mx