FESE Capital Markets Academy
Equity & Market Data

The speakers and moderator

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FESE - Federation of European Securities Exchanges

FESE represents **36 exchanges in equities, bonds and derivatives**

13 Multilateral Trading Facilities (MTFs) dedicated to listing and trading of SMEs

From **EU member** states as well as **Iceland, Norway and Switzerland**

16 Full Members and **1** Affiliate Member

35 Regulated Markets
13 MTFs dedicated to SMEs

1 Affiliate Member

Key figures: European financial markets

~8,000
Listed companies

~€9.1 tn
Market cap for listed companies

~€13 bn
Money raised at IPO

~€5.7 tn
Equity turnover

~€461 tn
ETDs notional turnover

~€6 tn
Bonds exchange turnover

Source: FESE 2020 data

Key facts: Exchanges

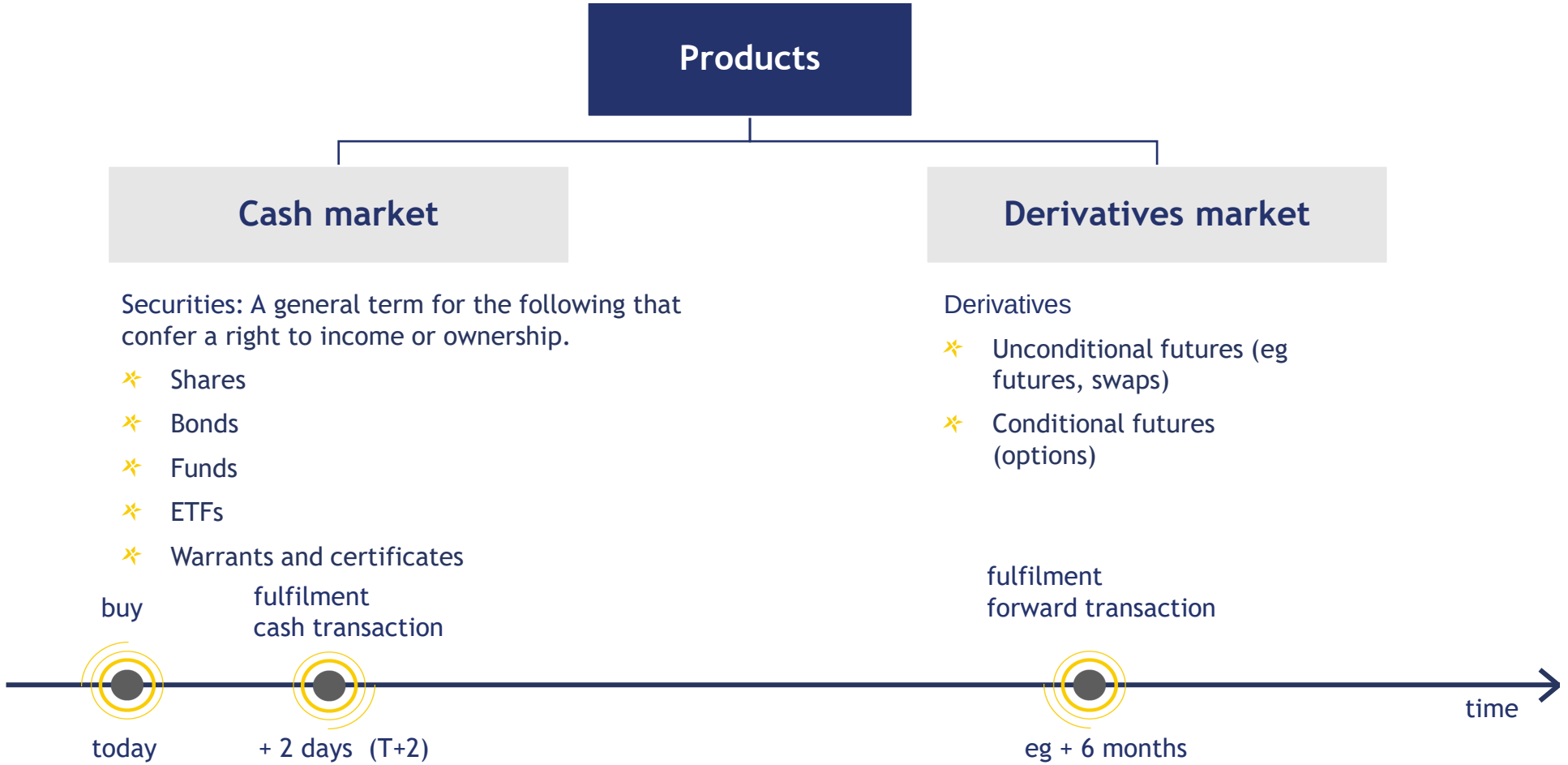
Market venues where investors can **buy or sell** different financial instruments at prices they can trust and which they know in advance

Investors buy and sell financial instruments for several reasons: return on investment, diversification, protection against market fluctuations, etc.

Frequently traded instruments: shares, bonds, currencies, commodities and derivatives

Companies **use financial instruments** to finance themselves and to manage their risk

Cash and derivatives market



What you will learn today

What is equity trading and how it works. We will provide you with an overview of concepts, definitions, how it all links together. We will explain you how price formation works and why it is important.

What is market data? What would a consolidated tape imply?

What are ETFs? We will discuss their characteristics, the evolution and the trading model

How is equity regulated? We will also focus on the differences between systematic internalisers and trading venues

All topics will be addressed from a functional as well as a policy perspective and there will be a focus on EU regulation.

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Equity Trading

Concepts, definitions, how it all links together

What is traded?

Equity
(also known as a 'share' or 'stock')

- part of a company which provides the holder with partial ownership in the company.

A stock price reflects the future value of the company divided by the number of shares.

Blue-chip - what does that mean?

A common definition of a large company that is leading in its sector. Typically, stocks in main indices (CAC40, OMXS30, FTSE100 etc.) are called Blue Chip stocks.

Who is trading?

There are different actors along the chain.

Investors are the end user and will eventually own the shares.

They can be an individual or companies.

Banks or Brokers are the intermediary between investors and Stock Exchanges where shares are traded.

In short – they can buy or sell on behalf of the investors.

How is it traded?

A Stock Exchange centralises all the buy and sell interests (orders) coming from investors and runs a trading mechanism based on the price at which investors are happy to exchange shares.

When a buyer and a seller agree on a price, the transaction takes place.

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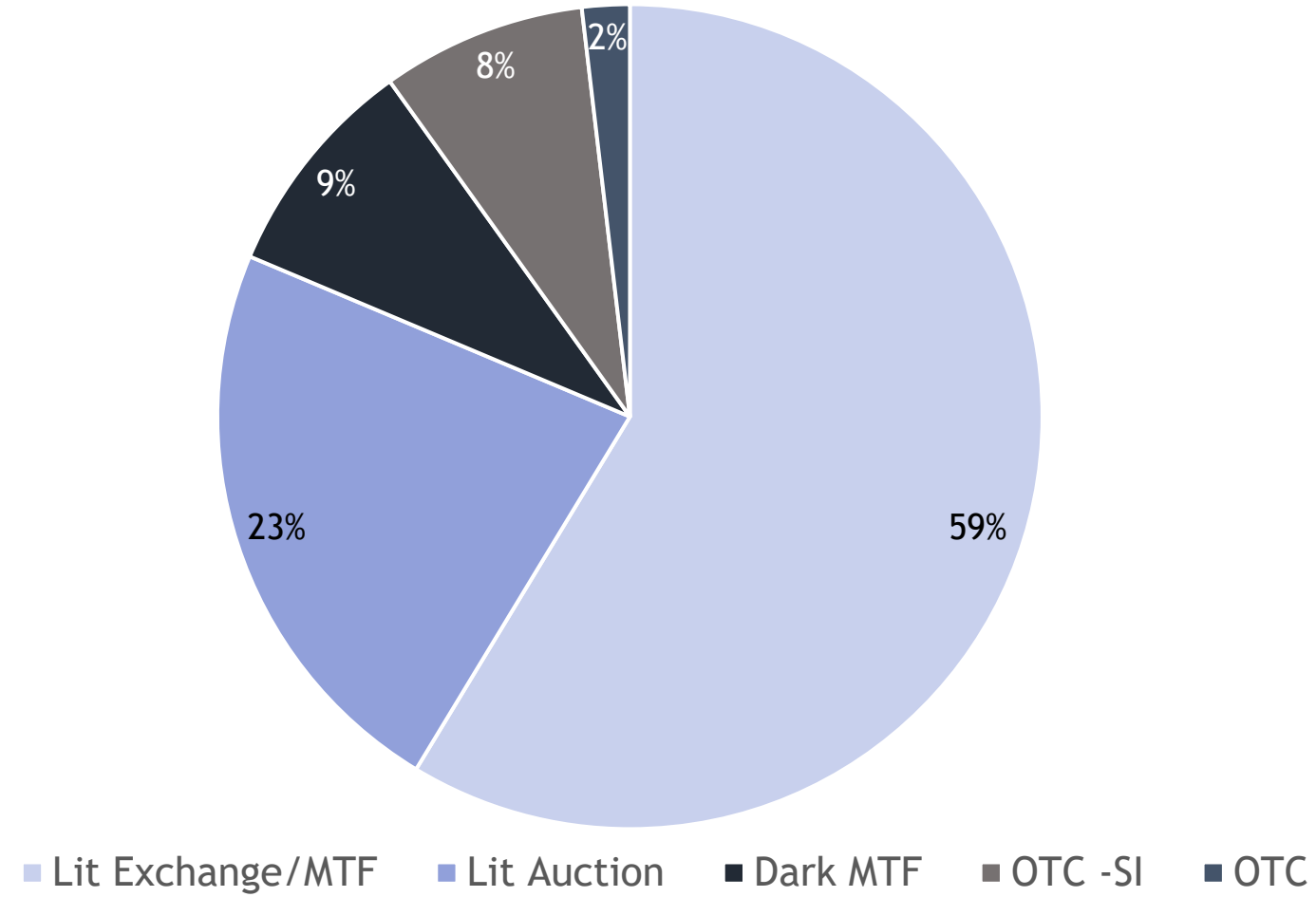
Equity Market Fragmentation

2021 European Equity Market landscape



Key highlights

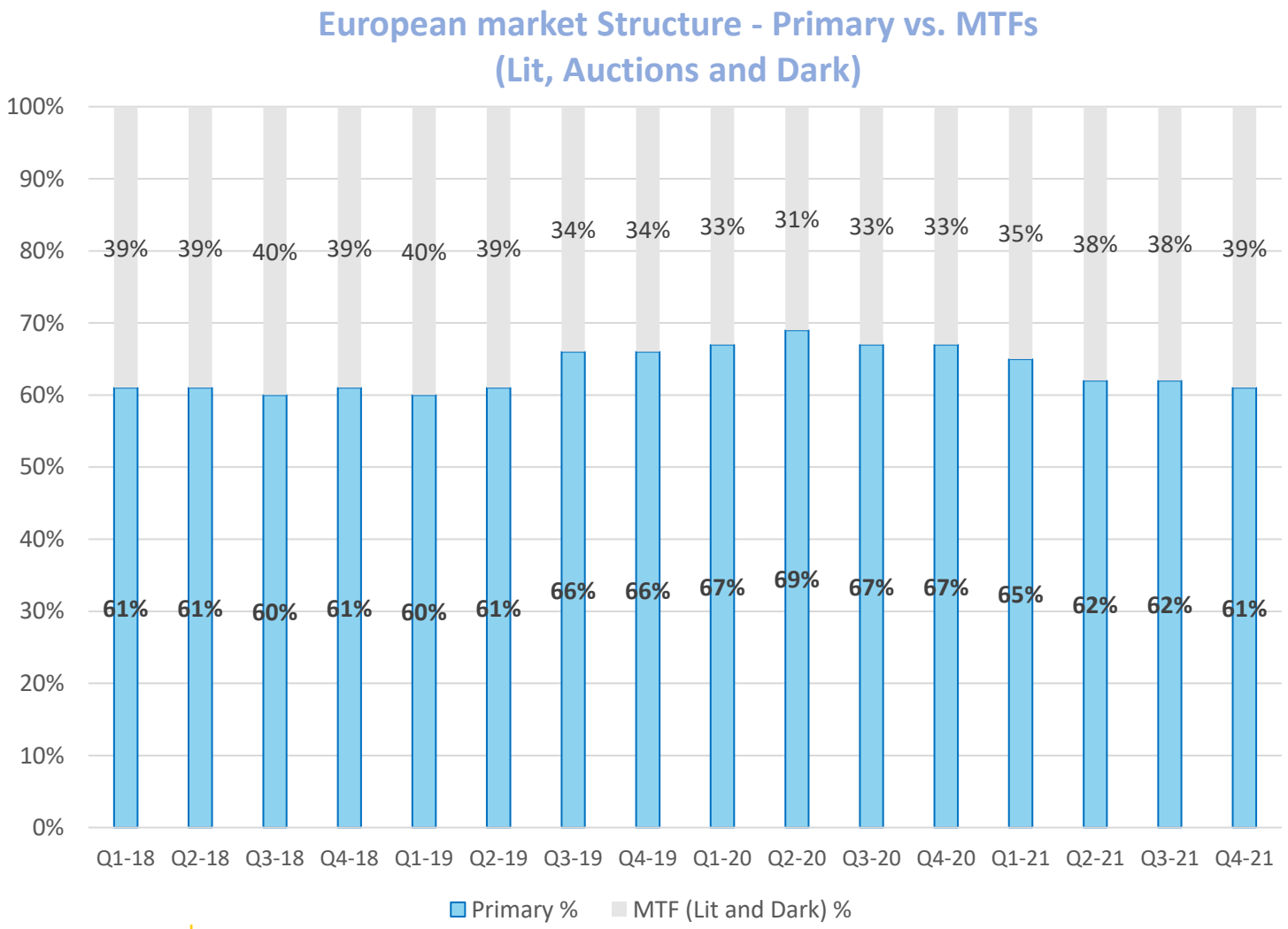
Regulated Markets: *Offering Primary market (listing of companies) and offering multilateral trading mostly within the Lit Continuous session and Auctions.*

MTF: *Alternative venues offering trading of stocks already listed on a Primary Exchange via multilateral trading attracting liquidity with technology and cost of execution on Dark or Lit trading.*

SI: *Alternative place of execution offering bilateral trading on stock already traded on Primaries. Run by a Bank or a Liquidity Provider against their own capital (from the owner of the SI)*

Source: Big XYT

Equity Market Fragmentation



Key highlights

Lit Continuous: *Lit trading offers clear and transparent view on supply and demand but also on the intentions of the buyers and sellers. Most of the venues offer lit trading with a particular obvious preference for Primary Exchanges.*

Auction session: *In an auction market, buyers enter competitive bids and sellers submit competitive offers at the same time. Matching bids and offers are then paired together, and the orders are executed.*

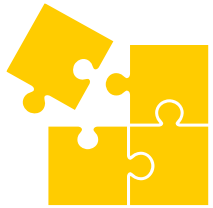
Dark: *Dark trading allows to trade important block of a security without pre trade information. The information is published only once the block is traded.*

Source: Big XYT

How are prices formed on exchanges?

- Exchanges provide price and price dissemination to the benefit of all market participants under strict rules, safe IT services and market integrity.
- Transparent trading on Exchanges – which provides price formation - contributes to fairer and more efficient markets and lower costs of capital for European companies. Hence, Exchanges play a key role in facilitating economic growth and providing investment opportunities for all investors.

Matching Supply and Demand



Exchanges provide a venue for an open and efficient interaction between buyers and sellers of securities*.

Price Formation

The interaction between buyers and sellers allows them to determine a common price.

- Market data is the outcome of a dynamic price formation process and is a joint product with trade execution — i.e. it is not possible to generate one without the other, and most activities undertaken by an exchange deliver both trading and price formation.
- Desirable properties of any price formation process are accuracy and speed. Prices must adjust quicly and accurately to news. When price formation processes satisfy those two properties, prices better reflect expectations about the true value of the asset.

Trading mechanism

How does a transaction happen?

A participant will show a price at which he is ready to buy a stock. Participant A “bids” for it.

At the same time, another participant will show a price at which he is ready to sell a stock. Participant B “asks” for a price.

When A, B or any other participant agree on a price, the transaction takes place and the stock changes hands.

Supply and Demand

Bid and Ask is a fundamental concept of equity trading as it contributes to form the price of a security.

Stock exchanges run the transaction mechanism to allow a transparent and harmonised process.

In a large majority, the transaction mechanism is run electronically but some exchanges still use a manual transaction process.

Auction trading

Opening and Closing Auction

An Auction is a period where no automatic execution takes place in order to concentrate available liquidity. During an auction call period (typically 5-10 minutes long), orders can be entered, modified or deleted. The auction uncrosses (creates the individual trades) at a random time point at a price where most shares can be traded.

The Opening auction sets the Opening price for the trading day, and sets the price for the first trades.

The Closing auction sets the very important closing price. The Closing auction is an important liquidity event with more than 20% of the total order book trading in one single liquidity event.

Other Auctions

Exchanges have different means of controlling volatility. An individual stock can be subject for a short interruption of continuous trading in case the price fluctuates a lot from latest paid price or a reference price. The volatility halt auction is typically a couple of minutes long.

Frequent Batch Auctions (FBA) have grown over the past few years and offer an alternative matchning service utilizing the auction mechanics. It differes from from conventional auctions in terms of a shorter duration (sub one ms). Secondly, conventional auctions are scheduled by the trading venue, whereas FBAs are either triggered as soon as an order is submitted, or once a potential match has been identified.

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What made electronic trading possible?

Dematerialisation

Dematerialisation is the move from physical certificates to electronic bookkeeping.

Actual stock certificates were removed and retired from circulation in exchange for electronic recording. Newly produced certificates can be registered and transferred electronically.

By saving the action of storing and moving physical certificates, dematerialisation allows for fast and reliable transactions between buyers and sellers.

Information Network

The development of networks over the years to transfer information and the connections from exchange members made access to stock exchange much easier and cheaper.

Today, fiber optic networks connect major financial centres around the global and allow instant and reliable communications between connected institutions

Trading Infrastructure

Order Book

Market participants' interests to buy or sell shares are relayed to the exchange or other trading venue through orders. These orders meet each other in an order book.

Orders are submitted to the trading venue via investment firms. Trading venues typically have many members and they are able to trade in a multilateral way with each other. Orders are matched into trades in the trading venue's trading system.

When trading on trading venue, all orders are binding. By default, all orders are visible to market participants. Visible orders form the Central Limit Order Book ("CLOB"), the most transparent trading mechanism.

Tick Size

Tick size is the smallest allowed price movement and thereby also the smallest possible difference between buy and sell price, i.e. minimum spread.

In CLOB, price of an order is usually prioritized over other priority criteria such as the time the order is entered. This means that even if the order is entered well in advance, a later posted order with better price is prioritized.

Tick sizes are set to shares based on their liquidity and price ranking – the more a share is traded and/or the lower the price, the smaller the tick size. Ideally, tick size would balance the trade-off between price and time priority in a way that best suits efficient price formation.

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Trading Infrastructure

Matching Engine

Matching engines are the software effectively matching buyers and sellers together and allow transactions to happen.

They are in a large majority developed by each major exchanges but smaller ones can choose to buy the technology.

The goal is to match both sides as quickly as possible so low latency is an important factor of a matching engine.

Latency

In order to benefit from investment's opportunities, the latency is an important component of trading equities.

The infrastructure plays a crucial role as it can dramatically impact latency and give (or cancel) an edge to a firm versus another.

Latency measures in milliseconds (1ms = 1/1 000 sec) when it comes to network but measures in microseconds (µs = 1/1 000 000 sec) when it comes to matching engines.

External factors can have an impact on latency. For example, the geographical location of a given data user can impact latency.

The average human eye blink takes 350ms.

Trading Infrastructure

Trading Front End

A Trading Front End is an application to create, send and manage orders.

It allows traders and asset managers to communicate their orders with their brokers and receive executions in real time.

Usually, the application can also receives news, quotes and other financial information.

Examples of front ends are Bloomberg, Refinitiv, etc.

Sometimes, these applications can be developed internally.

Connectivity

A Trading Front End can connect directly via a dedicated network line between the bank or broker and the Exchange. The line is let from a network provider.

An easier and more integrated but potentially slower solution is to use a vendor's network to connect to an Exchange. The connections can be provided by the same vendor as the Trading Front End and allow access to exchanges but also between financial firms.

Trading Controls

There are many controls and mechanism ensuring orderly trading conditions. These include, amongst others, control mechanisms set by trading venue, investment firms acting as trading venue member or regulation at EU/national level.

Such controls aim to prevent erroneous orders entering the order book, to restore the orderly trading after volatile conditions, and to safeguard the resilience of the trading system.

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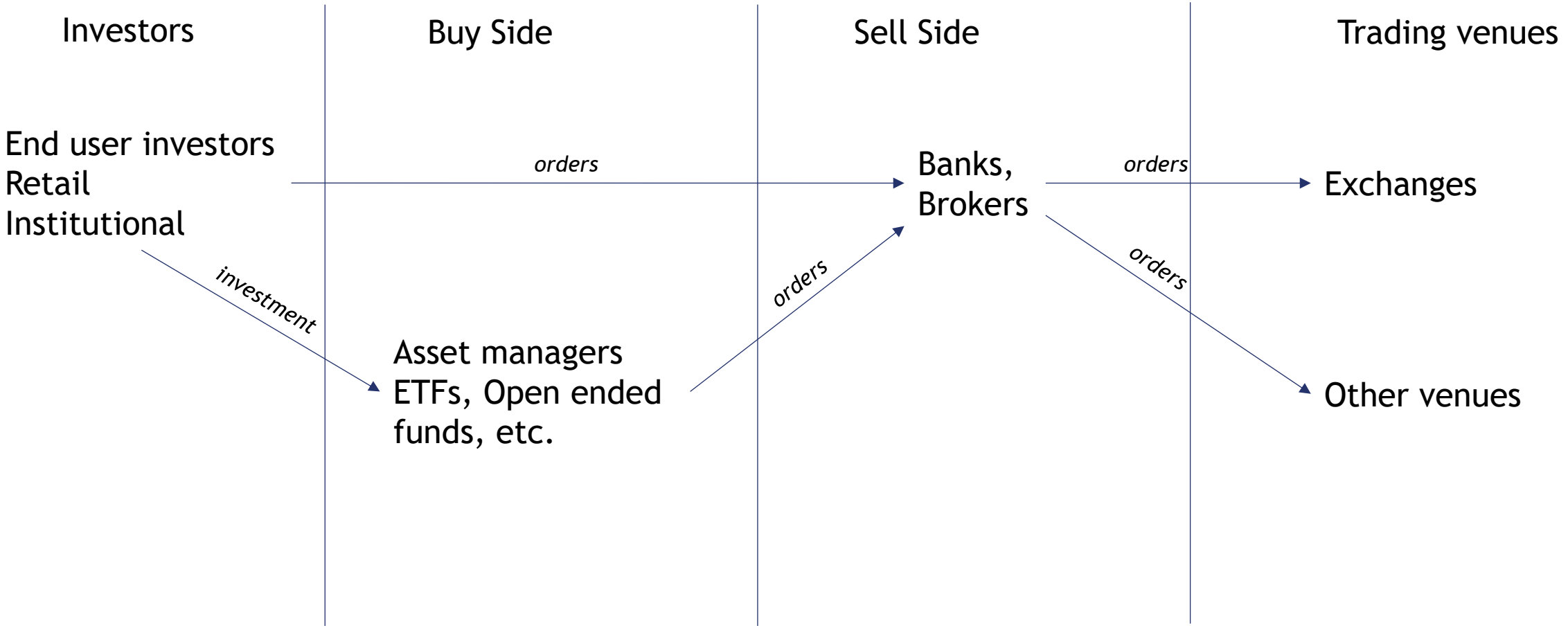
Presentation of different actors



MiFID II categorisation of actors

Investor protection

Regulations require investment firms to categorise their clients in order to determine the correct level of investor protection and transparency.

Clients can be

- eligible counterparties,
- professional clients or
- retail clients

and clients can move between the three categories. In particular, it is possible for an investment firm to reclassify a retail client as a professional client, once certain qualitative, quantitative and procedural requirements are met.

Client classification

A client is anyone to whom the firm provides a MiFID service.

- Eligible counterparties include: investment firms and credit institutions, as well as those who are 'opted up' on the basis of their experience and expertise. A firm may only treat a client as an eligible counterparty in relation to eligible counterparty business.
- Professional Clients include: credit institutions, investment firms and collective investment schemes as examples, as well as "opted up" retail clients.
- Retail Clients are all other client.

A firm must implement appropriate written internal policies and procedures to classify its clients.

Retail and Institutional investors

Characteristic of Retail

Investment through funds, ETFs

Direct investment in stocks with a particular appetite for small / mid caps

Characteristic of Institutional investors

Funds from other institutional firms:

- Banks
- Insurance companies
- Wealth manager, etc.

Direct ownership by investing in companies during capital increase or secondary market

Institutional investors can be private companies or owned by a government (sovereign funds)

Asset Managers

Traditional Funds

- Open ended funds:

An open-end fund is a diversified portfolio of pooled investor money that can issue an unlimited number of shares. The fund sponsor sells shares directly to investors and redeems them as well.

- Closed ended funds

A closed-end fund is a portfolio of pooled assets that raises a fixed amount of capital through an initial public offering (IPO) and then lists shares for trade on a stock exchange.

Unlike stocks, fund shares do not give its holders any voting rights.

Valuation is calculated at the end of a trading day (Net Asset Value)

ETFs & ETPs

Unlike stocks, ETFs or ETPs do not give its holders any voting rights.

Valuation is calculated in real time and varies along the day

ELPs, HFTs, Banks/Brokers

Electronic Liquidity Providers, Market Makers

Use their funds to offer liquidity on exchanges, contribute to liquidity and price stabilization

Short term investing view

High Frequency Traders

Use state of the art technology to access exchanges as fast as possible and benefits from small price distortions. Can also be market makers.

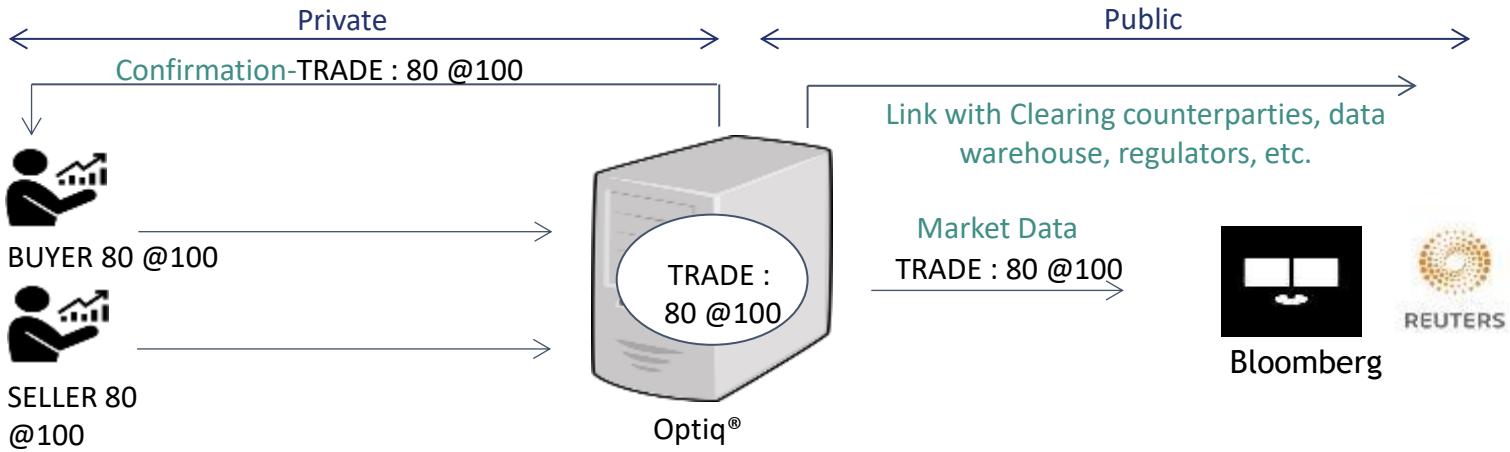
Short term investing view

Banks and Brokers

Execute clients' orders following instructions via a set of algorithmic strategies

Execution takes place across several venues, on exchange or OTC

Trading systems



Order Entry (OEG)

- Low latency connection
- Private messaging to confirm transactions

Matching Engine (ME)

- High performance and reliability
- Multi market trading platform

Market Data

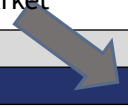
- Real time full depth order book, Best limits, Trades
- For every instruments on regulated markets
- Anonymity of participants

Trading phases examples

Continuous trading

Last traded price is 100; new buy order incoming with a quantity of 150

Buy 150 @ Market



Euronext			
Bid		Ask	
Quantity	**Price**	**Price**	**Quantity**
(50)	100	102	(200)
(1000)	98	105	(500)
(500)	95	110	(2000)

Continuous trading:

- Liquidity comes from the passive order
- Trade : 150 @ 102€

Closing auction

Auction orders are sent during a five minutes accumulation period. At the end of the period, the balanced price is calculated and displayed

Euronext			
Bid		Ask	
Quantity	**Price**	**Price**	**Quantity**
(100)	mkt	102	(200)
(50)	102	105	(500)
(1000)	100	110	(2000)

Auction:

- Euronext algorithm calculates the maximum tradable quantity at the best price.
- In this example: 150 @ 102€

Order types

Example of Market Order, Limit Order and Iceberg Order

Buy 100 @ Market

Euronext			
Bid		Ask	
Quantity	Bid	Ask	Quantity
(50)	100	102	(50)
(1000)	98	105	(50)
(500)	95	110	(2000)

Trades

- 50 @ 102
- 50 @ 105

Average trading price

100 @ 103,5

Buy 300 @ 106 (limit)

Euronext			
Bid		Ask	
Quantity	Bid	Ask	Quantity
(50)	100	102	(200)
(1000)	98	105	(500)
(500)	95	110	(2000)

Trades

- 200 @ 102
- 100 @ 105

Average trading price

300 @ 103

Sell 500 @ 100

Euronext			
Bid		Ask	
Quantity	Bid	Ask	Quantity
990 hidden (10)	100	102	(200)
(1000)	98	105	(500)
(500)	95	110	(2000)

Trade

- 500 @ 100

Order book after the trade:

Euronext			
Bid		Ask	
Quantity	Bid	Ask	Quantity
490 hidden (10)	100	102	(200)
(1000)	98	105	(500)
(500)	95	110	(2000)

Liquidity Types

Long only

Liquidity originated from Long only investors is usually large passive orders executed along the day, in line with volume attempting to minimize market impact.

Use the closing auction to get benchmark price.

Market maker

Market makers almost constantly post order on both side of the order book to bring liquidity and limit volatility of the stock traded.

They benefit from orders crossing the spread to finance their activity.

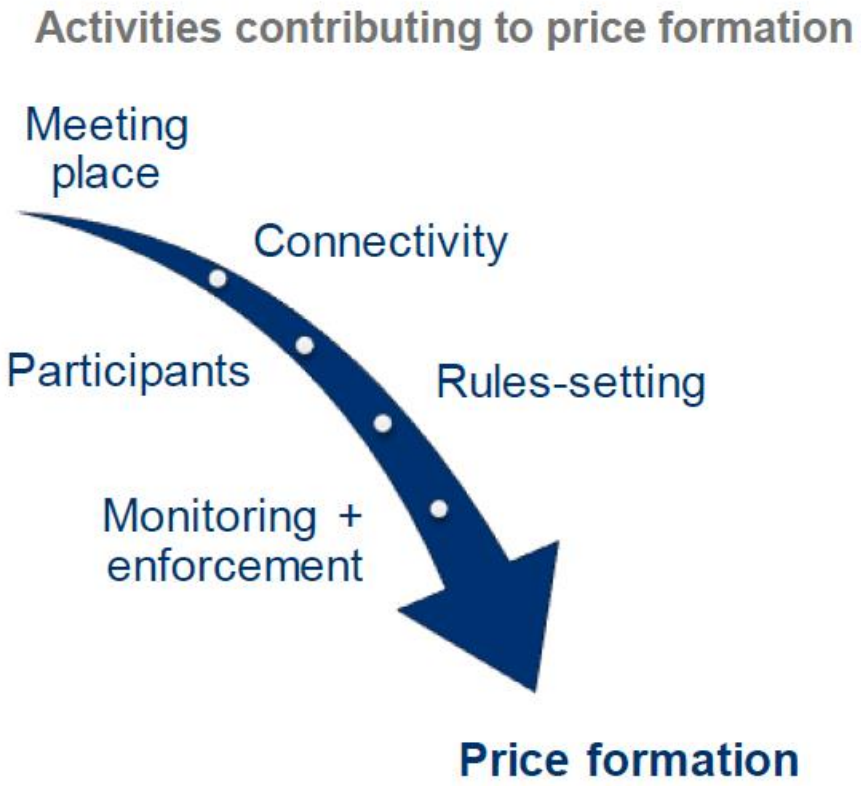
Arbitrage

Usually risk free activity where an arbitrager will buy a stock on a venue and sell the same stock on another venue at a higher price, benefiting from differences from supply and demand.

Very competitive field, arbitrage can develop into more complex strategies (sector, market, etc.)

2 Market data and the consolidated tape

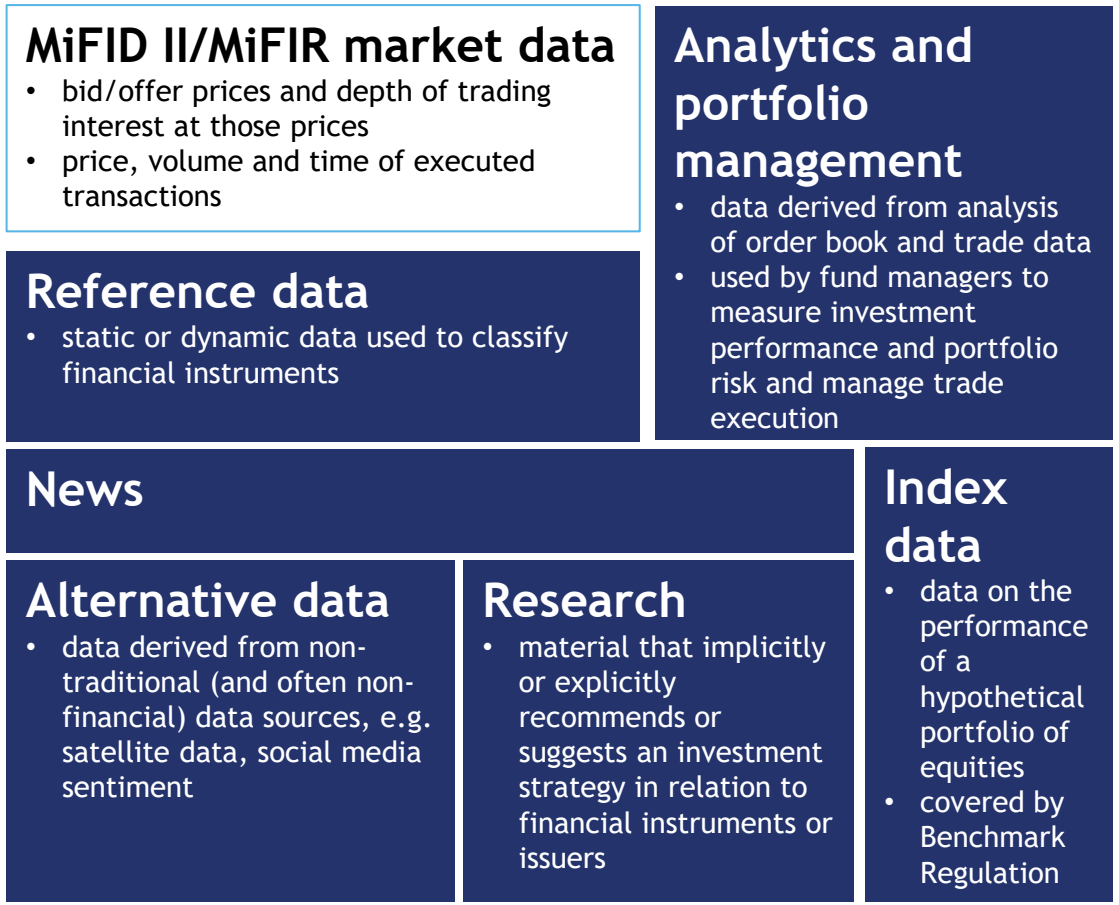
The role of market data in equity trading



Source: Oxera.

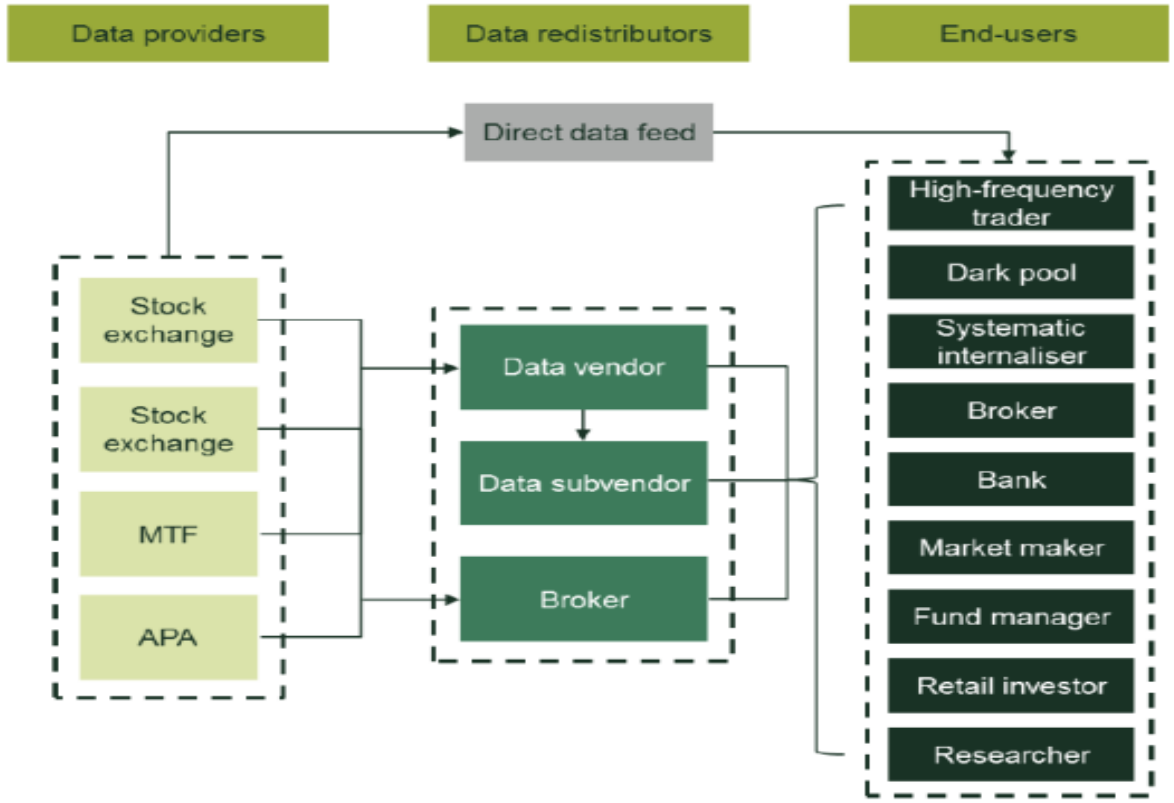
- Trading venues deliver both trade execution and price formation, through a range of activities. Market data is the outcome of a dynamic price formation process and is a joint product with trade execution (i.e. it is not possible create one without at the same time creating the other).
- Trading venues license the data product of trade execution and price formation, market data. This includes pre- and post-trade information. Post-trade information means information on the executed trades specifically the executed prices and volumes whereas pre-trade information covers information on the quotes / orders and respective volumes.
- Investors use market data to inform trading decisions.
- A number of entities use market data provided to run commercially rewarding business models (platforms such as dark pools use this information to execute trades at the mid-price, while SIs can use it to inform the setting of their own prices).

MiFID market data is a small part of the total market data



Source: Oxera

Market Data Value Chain



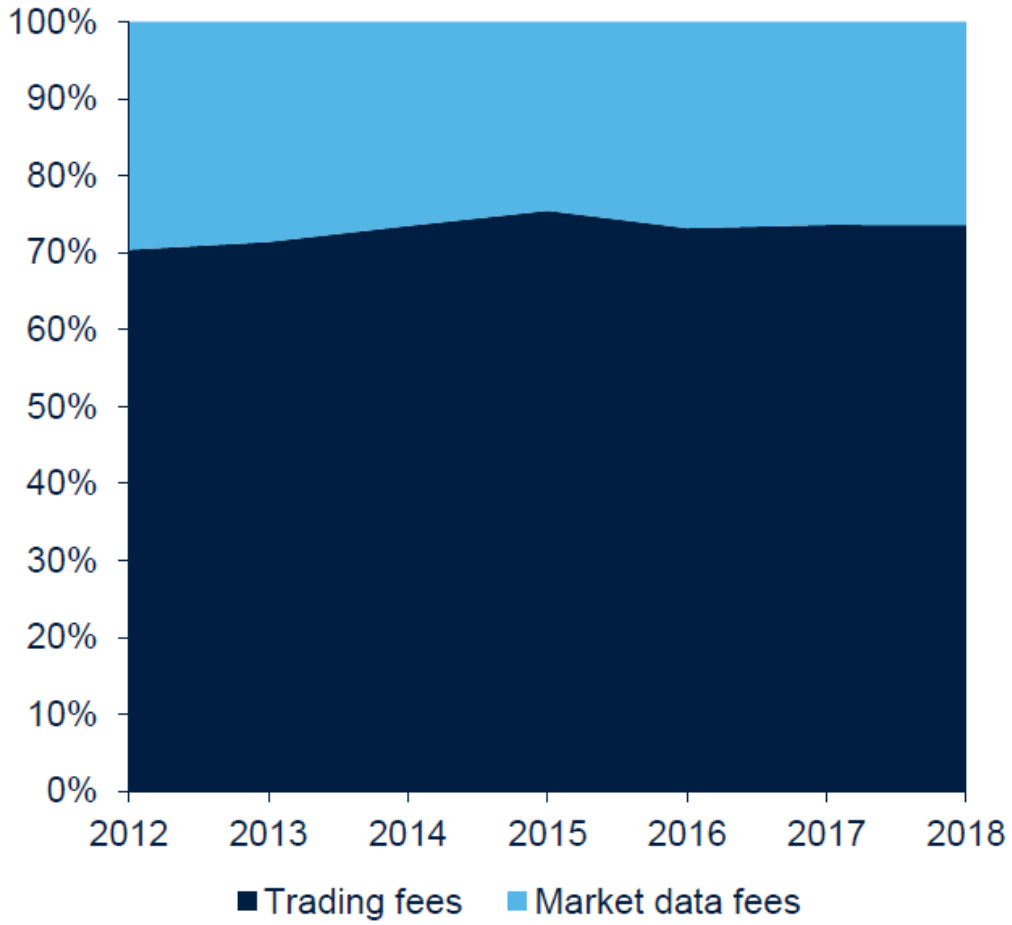
Note: This is a simplified representation of the value chain. Certain end-users, such as academic researchers and retail investors, are unlikely to source a direct feed from a trading venue and tend to use delayed data. Brokers may also redistribute market data to their clients. Data vendors may also redistribute to other data vendors (subvendors).

Source: Oxera.

Market data in the EU

- Market data more than 15 minutes old is made available free of charge to end-users by stock exchanges.
- This means that retail investors who want to know what their portfolio is worth, fund managers who need to value their funds at the end of the day, and many other professionals who use share prices for financial or economic analysis can receive the high-quality market data from exchanges without paying any exchange fees.
- ESMA acknowledges that market data plays an important role in financial markets and that market participants are consuming an increased amount and variety of data, requiring innovations by trading venues and data providers for the infrastructure necessary to provide and use the data.

Revenue shares from delivering equity trading and price formation, 2012–18 (weighted average of FESE exchanges)



Source: Oxera.

The consolidated tape

Brokers and investors do not have a clear consolidated picture of liquidity in the EU.	MiFID II introduced the role of a consolidated tape for Europe that shall cover post-trade information from all trading venues.	Serious consideration must be given to what kind of tape can address fragmentation in a sensible and cost-effective way to address relevant use cases
Trading is fragmented and the relevant data is not comprehensively consolidated. Data vendors do provide consolidated views of Exchange / MTF data however OTC and SI data is currently hard to use.	Nevertheless, no commercial CT offering has emerged, mostly due to structural challenges to obtain data in high-quality from all trading and execution venues (including SI and OTC).	The most critical issues are: 1) low data quality from many SI and OTC venues 2) latency means users in different locations will have a different view of the latest traded price

Different consolidated tape options

DESIGN CRITERIA

Coverage

Asset class
Geography
Venue

Speed

End of day
Delayed
Real time
Low latency

Depth

Last price | Post-trade
Best Bid and Offer | Pre-trade

CT OPTIONS

1. **Pre-trade**
   Real-time
   Prices and volumes of orders and quotes, at minimum latency technically feasible, and BBO depth

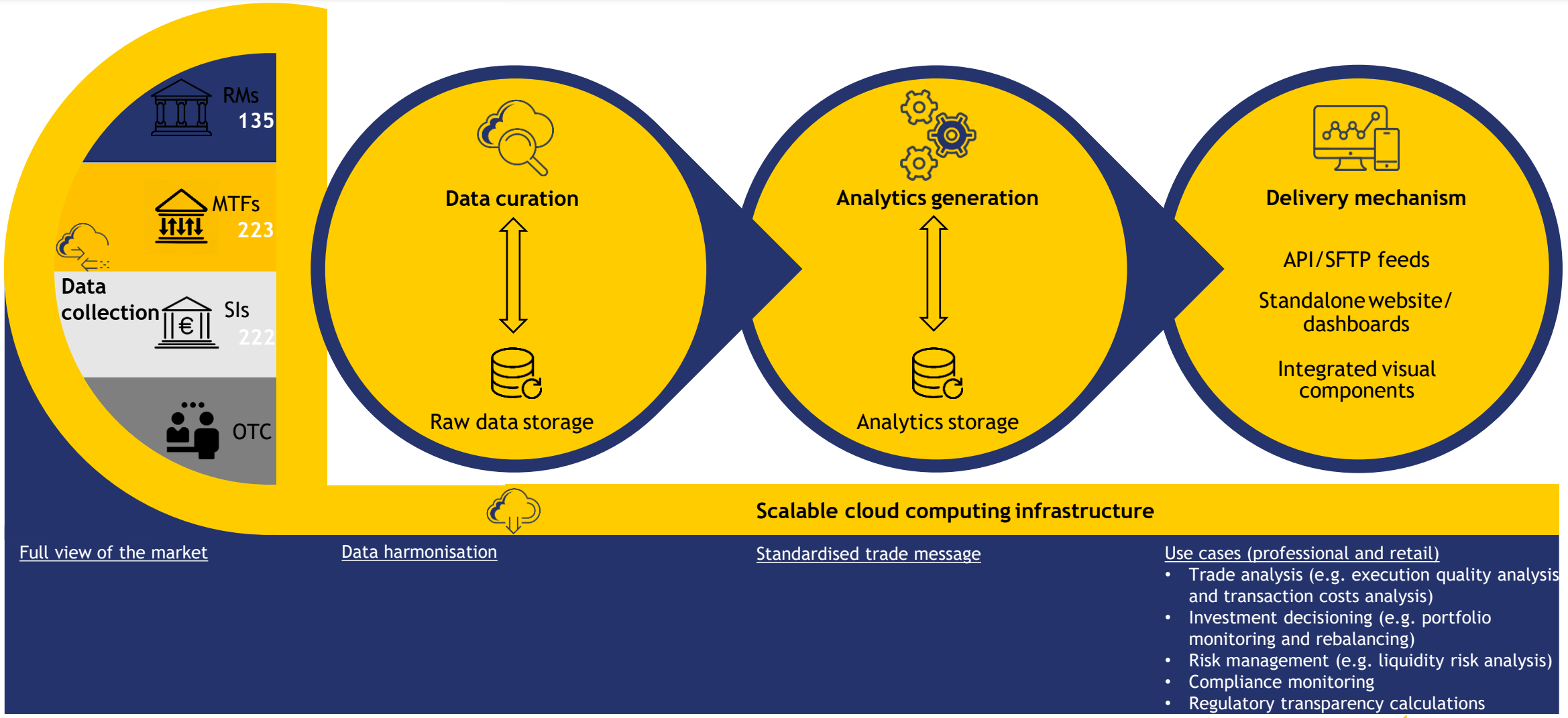
2. **Post-trade**
   Close to real-time
   Prices and volumes of executed trades, as close to real-time as technically feasible

3. **Post-trade**
   15-minute delay
   Prices and volumes of executed trades, published 15-minute after execution

4. **Post-trade**
   End of day
   Prices and volumes of executed trades, made available at the end of the trading day

Source: Oliver Wyman Analysis

The structure of a consolidated tape



3 ETFs

What is an index ?

An index is an indicator which reflects the aggregated performance of its underlying set of constituents.

- **Broad market** indices generally include a large number of shares or bonds (constituents). Typically, stocks in main indices (CAC40, STOXX600, FTSE100 etc.) that are called “Blue Chip” stocks. They allow investors to measure and invest in the economy of a specific country or region.

- **Sector & Factor** indices are composed by a subset of listed shares, according to their business focus area and/or their quantitative characteristics (e.g. dividend yield, volatility, value/growth, momentum …).

- **Return** of indices can have different methodologies depending on the dividend (and taxes) integration or not (Price, Growth Total, Net Total)

- **Weighting** of indices can also have different methodologies. The main one is the market capitalisation but this also can be the price. Some other will chose an equal weighted basket of stocks or integrate the above mentioned factors.

What is an Exchange-Traded Fund (ETF)?

An exchange-traded fund (ETF) is an investment fund that trades on trading venue, like stocks. ETF take “best of both world”.

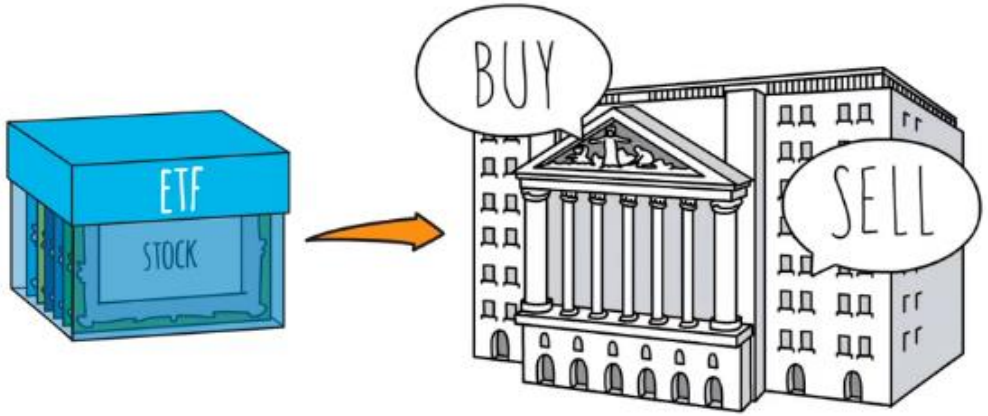
Benefits of a fund :

- Broad Diversified holding of securities
- Pools capital across investors
- Provides economies of scale

Benefits of a stock :

- Trading flexibility & transparency
- Continuous pricing
- Ability to borrow or short

ETF shares are bought and sold on an exchange



What is an Exchange-Traded Fund (ETF)?

ETFs have lots in common with funds and stocks :

	Stocks	"classic" Mutual Funds	ETFs
Trading Period	Intraday	T+1 (NAV)	Intraday and NAV
Share price advertised	Every trade	T+1 (NAV)	Every trade + NAV
Can be borrowed / shorted	Yes	No	Yes
Regulated fund	No	Yes	Yes
Composed of a portfolio of underlying securities that brings diversification	No	Yes	Yes
Key driver of share value	Buying and selling demand for the security	Buying and selling demand for the underlying securities	Buying and selling demand for the underlying securities and the security

ETF Trading Model

- When investors buy or sell ETF units on the trading venue, there is no change to the fund itself, i.e. the number of units remains unchanged. Trades take place between investors or with the Market Maker, not with the fund.

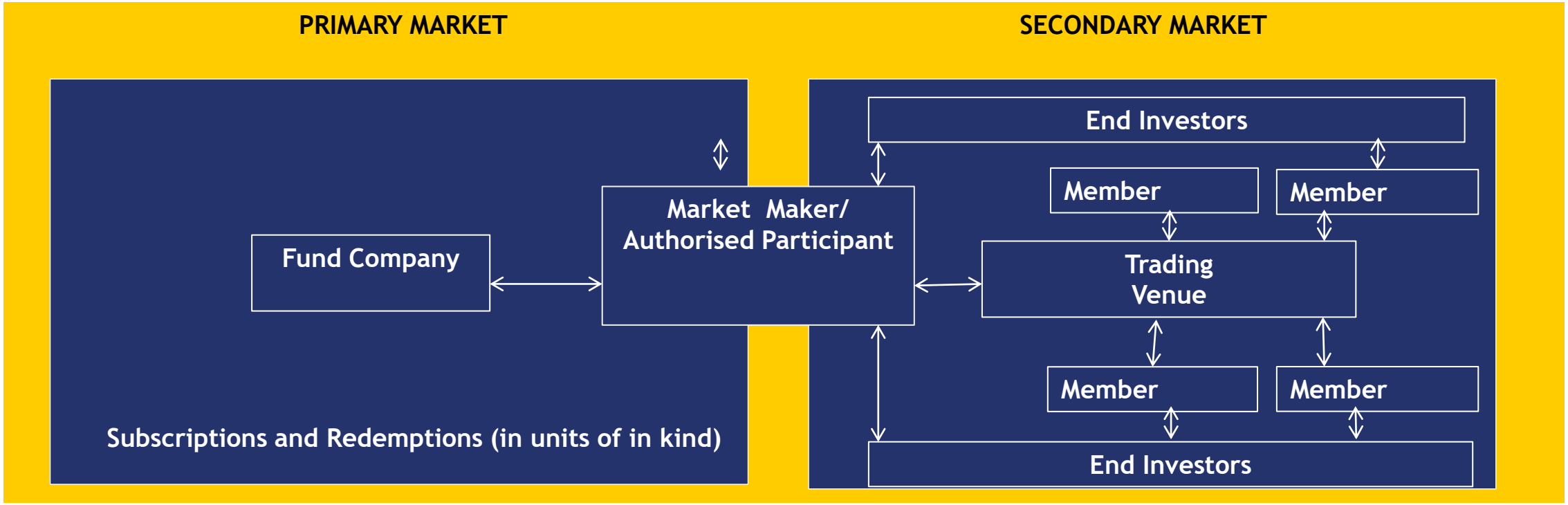
- Designated parties called “Authorized Participants” (APs) create more ETF units (subscription) when there is substantial increase in demand to buy ETF units in the secondary market i.e. trading venue.

- When demand in secondary market decreases significantly, units may be reduced by the APs (redemption).

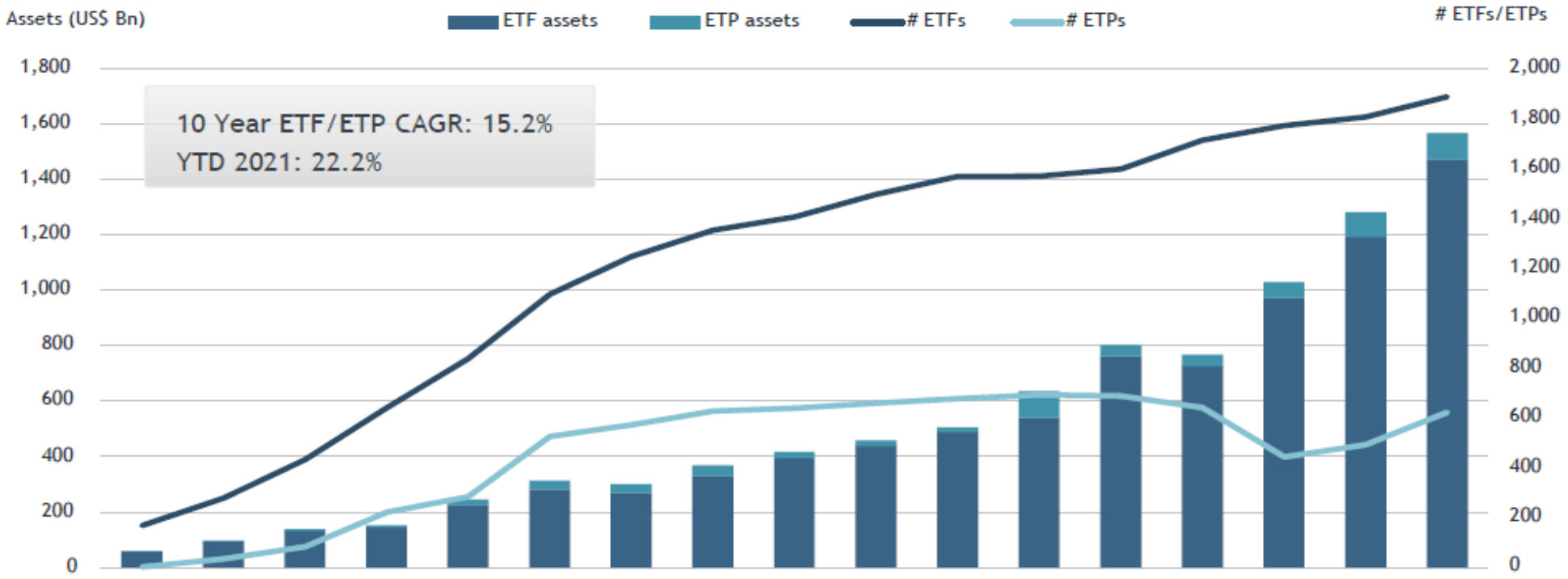
- This mechanism increases or decreases the number of units in the fund and keeps the ETF unit price aligned with the underlying basket.

ETF Trading Model

ETF market is characterized by the subscription and redemption process in the primary market :



Evolution of ETFs



Year	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	Oct-21
# ETFs	168	278	432	641	837	1,096	1,249	1,353	1,407	1,497	1,570	1,571	1,600	1,715	1,774	1,808	1,889
# ETFs/ETPs	170	312	515	862	1,120	1,622	1,821	1,980	2,047	2,156	2,248	2,264	2,288	2,357	2,218	2,300	2,512
ETF assets	57	94	131	143	226	281	268	331	395	438	487	542	762	726	974	1,194	1,474
ETF/ETP assets	58	96	138	152	245	313	300	369	418	458	505	573	802	768	1,031	1,284	1,569

Source: ETFGI data sourced from ETF/ETP sponsors, exchanges, regulatory filings, Thomson Reuters/Lipper, Bloomberg, publicly available sources.

Evolution of ETFs

- European ETF market emerged in 2000 (vs early 90's in the US). It has been growing in recent years as both institutional and retail investors look for low cost investment opportunities.

- In 2018, EU regulation on financial instruments (MIFID 2) expanded to cover ETFs. The resulting improved transparency has been welcomed by investors as traditionally around 75% of ETF trading took place outside trading venues.

- European ETF market has seen a rise in web-based advisory services (robo advisory) as regulation brought restrictions on commission payments to fund distributors.

The role of the Exchange

- Exchanges offer a safe, STP and cleared environnement to the investors.
- The natural liquidity in the order books is fully accessible to all investors, pre and post trade transparent and guaranteed by a CCP.
- Exchanges offer the main and more reliable reference price formation on the secondary market
- Exchanges are continuously innovating to answer client need with some specific area of focus that can include NAV/Primary market platform, Retail specific offer or ESG initiative as some examples.

4 Regulatory framework

How is equity regulated?

Markets in Financial Instruments Directive (MiFID II) and Regulation (MiFIR)

- Aimed at making financial markets more efficient, resilient and transparent, and at strengthening investor protection

The Prospectus Regulation & Transparency Directive

- EU rules on information that must be provided by companies that want to attract investors, raise capital and finance their growth

The Markets Abuse Regulation (MAR) and Markets Abuse Directive (MAD)

- Aimed at ensuring the integrity of securities markets

FESE

MiFID I

Presentation

Market in Financial Instruments Directive – 2004

A European Union law that provides harmonised regulation for investment services across the 31 member states of the European Economic Area (the 28 EU member states plus Iceland, Norway and Liechtenstein). The directive's main objectives are to increase competition and investor protection in investment services. As of the effective date, 1 November 2007, it replaced the Investment Services Directive (ISD).

Key elements

Passporting

Client categorisation

Pre- and Post- trade transparency

Best Execution

Systematic Internaliser and BCN

MiFID I - Impact

Passporting

Passporting allows a firm registered in the European Economic Area (EEA) to do business in any other EEA state without the need for further authorisation from each country

Client protection

Clients must be assessed to be categorised and offer an adequate level of protection and service

Executing Brokers must always execute at the best available price for their clients and have to deliver Best Execution

Systematic Internaliser & BCN

SI and BCN give Banks and Brokers the possibility to act as exchanges by pre-matching clients' opposite orders against their own capital (SI) or client to client (BCN).

These mechanisms help to reduce market impact but require an important volume of flow to be effective

MiFID I - Consequences

Fragmentation

Several venues can now offer the same fungible stock to trade.

Competition drives cost down but increase the complexity of the market structure and the blur the visibility of the trading

Banks and brokers run matching engine and match client to client, effectively reproducing mechanism usually found in exchanges

Concentration

The smallest brokers disappear as they cannot absorb the cost of connecting to new places or the investment required to develop algo functionality

Others give up their connection to exchanges and outsource their execution to bigger global brokers.

Those ones need to reach a critical size to survive and increase investments

Creation of new services

Best Execution being in the regulation, Transaction Cost Analysis (TCA) becomes a popular service to analyse where and how execution took place, certifying en client benefit from the best prices at the time the order was executed

FESE

MiFID II

Presentation

The directive aims to make European markets more transparent, efficient and safer for users. In the aftermath of the 2008 Global Financial Crisis, it is a tool to help restore customer confidence in the financial system by moving more financial instruments from the over-the-counter market onto listed and cleared markets.

Key elements

Make markets more transparent

Bring OTC trading onto regulated venues

Applies to all assets and actors

Research unbundling

Obligations on market data

Brokers, Exchanges, and in some cases end-user customers will be required to provide more data to regulators.

MiFID II - Impact

Trading behaviour

The introduction of Double Volume Cap (DVC) aimed to limit the volume that can be traded on Dark venues

Above a certain size (large in scale orders), trading can occur on dark venues without their volume being counted in the DVC.

Once the DVC threshold is reached, the trading is suspended on Dark venues

An alternative is now to use periodic auction, a form of grey (half dark, half lit) trading

Share Trading Obligation

Share Trading Obligation is an important part of MiFID II. In order to ensure that more trading took place on regulated trading venues and Sis MiFID II /MiFIR introduced a trading obligation requiring investment firms to conclude transactions in shares on RMs, MTFs, SIs or third-country trading venues assessed as equivalent.

Tick size harmonisation

To avoid complexity in prices published, tick size are normalized and calculated based on the price of the stock

All venues must quote and trade at tick size

Some waivers exist to allow sub-tick execution under particular cases (non price forming transaction, etc.)

MiFID II - Consequences

More fragmentation

The ban on BCN triggered the development of SIs set up by Liquidity Provider rather than Banks or Brokers as previously

This increased fragmentation as trading now occurs OTC rather than on exchange as intended to be the case by banning BCNs.

Data volume explosion

Market data volume is even more important than previously with the additional fragmentation and the development of new trading behavior

Participants need to store more data than previously (Order Record Keeping) and keep them accessible at regulator's request

They will have to store all communications, including phone conversations; electronic trading is encouraged, since it is easier to record and track

Transformation of Research

Research must now be priced separately rather than included with execution services

As a result, research focuses primarily on Blue Chips this has temporarily been addressed by the MiFID Quick Fix.

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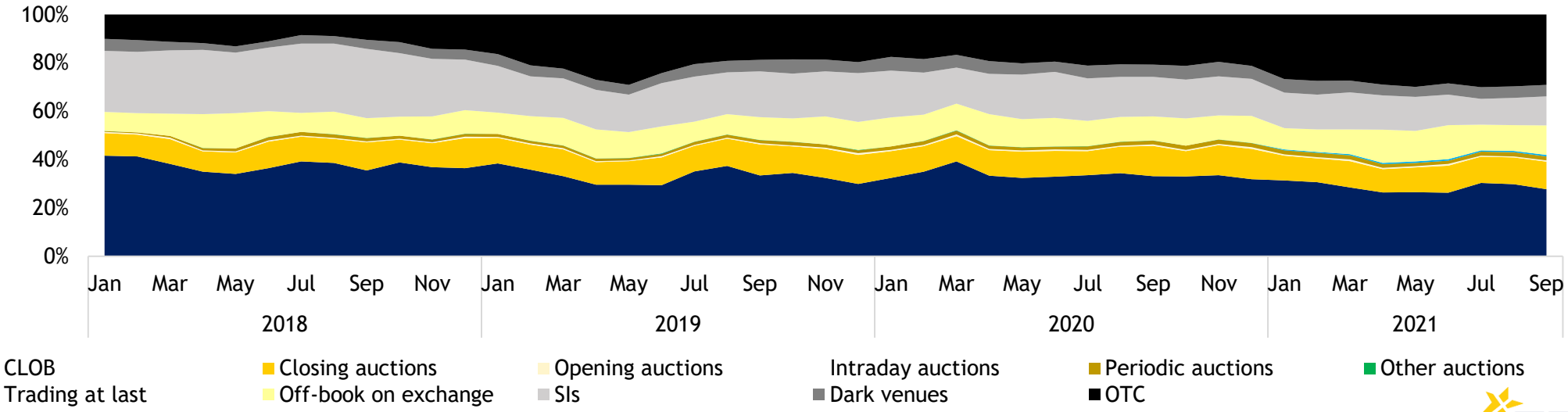
MiFID II - Consequences

- The overarching intentions of MiFID II are to increase fairness of markets by enhancing investor protection and improving market transparency and price formation.
- However, the trading landscape has become much more complex to navigate, with significant parts of the liquidity trading bilaterally outside trading venues via Systematic Internalisers, a capacity that investment firms can take on when execution client orders OTC on a bilateral basis against their book by taking risks.

STOXX 600 Turnover by trading category



Source: Big xyt

Q&A

Thank you all for participating!

For further information, please contact the FESE Secretariat

Annex

What's needed to be successful in Electronic Trading

Infrastructure

Banks, Brokers:

- Connectivity
- Trading platform (performance)
- Ancillary services

Exchanges:

- Connectivity
- Data centres
- Colocation

Software layer

Banks, Brokers:

- Algo, SOR - low latency framework
- Trading strategies
- Quantitative research team

Exchanges:

- Low latency matching engine

Post trade

Banks, Brokers:

- Clearing, Settlement
- Capacity to handle operations

Exchanges:

- Flexibility around CCPs, CSDs

Key parameters of an Exchange

Order Type

- Market
- Limit
- Icebergs
- Stop
- Stop limit
- Market to limit
- Quotes

Order Validity

- Fill or kill
- Immediate or cancel
- Day
- Good ‘till Time
- Good ‘till Cancelled
- Valid for uncrossing
- Valid for closing uncrossing
- Good ’till Date

Quote mechanism

- Central order book order driven (Equities, ETF…)
- Central order book quote driven (Warrants)

Trading phases

- Continuous
- Double auction
- Single auction

Effects from changes to the Market structure

Equity markets effects

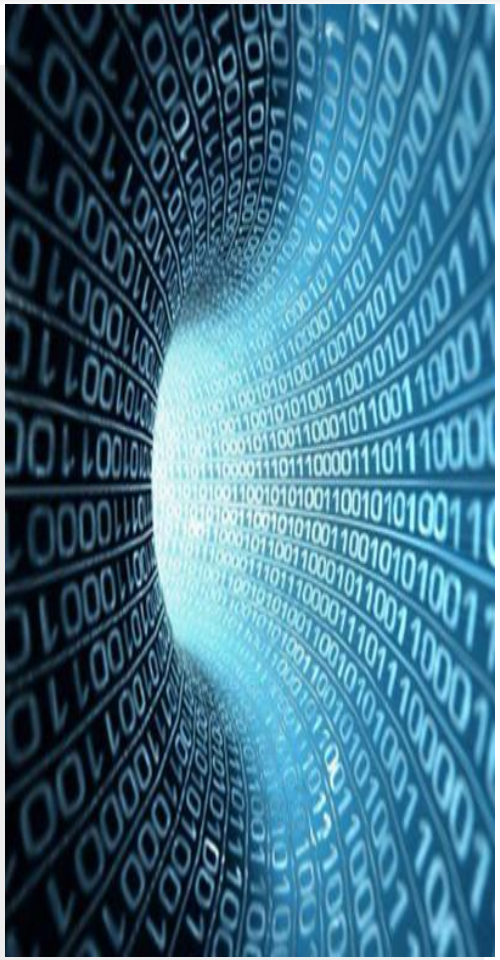
- The increased market share of bilateral conducted transactions means that European markets are evolving towards bilateral and not cleared equity markets. Such developments may raise stability concerns where the new market structure with more transaction been conducted against investment firms own risk books could build up excessive systemic and concentration risks.

- The increased number of SI and possible liquidity sources have also fragmented the European equity markets to a greater extend then pre MiFID II. This fragmentation has not only increased the complexity of the market but also divided the trading landscape into bilateral and multilateral execution to a larger extent than before. Fragmentation can to some extent have positive effects on competition that could be beneficial for the end investor, but too much fragmentation has clear negative effects for many market participants. Information about liquidity or prices are no longer equally accessible for investment firms clients, creating information and competition asymmetries that is disadvantageous to smaller investments firms that do not possess the financial strength and scale to gain access to all existing liquidity pools.

Effects from changes to the Market structure

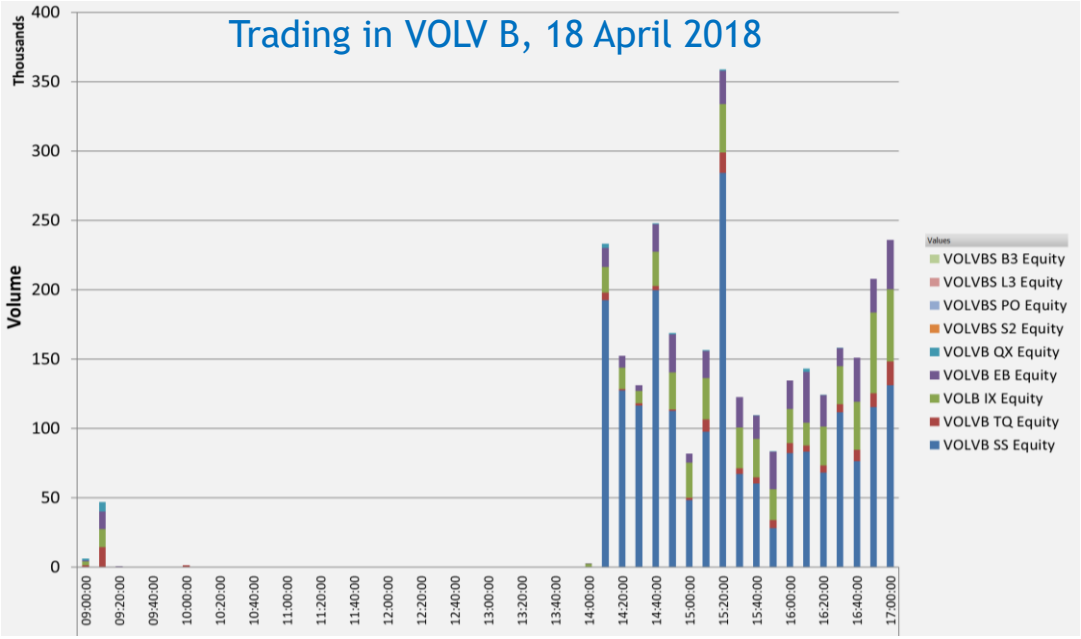
Equity markets effects

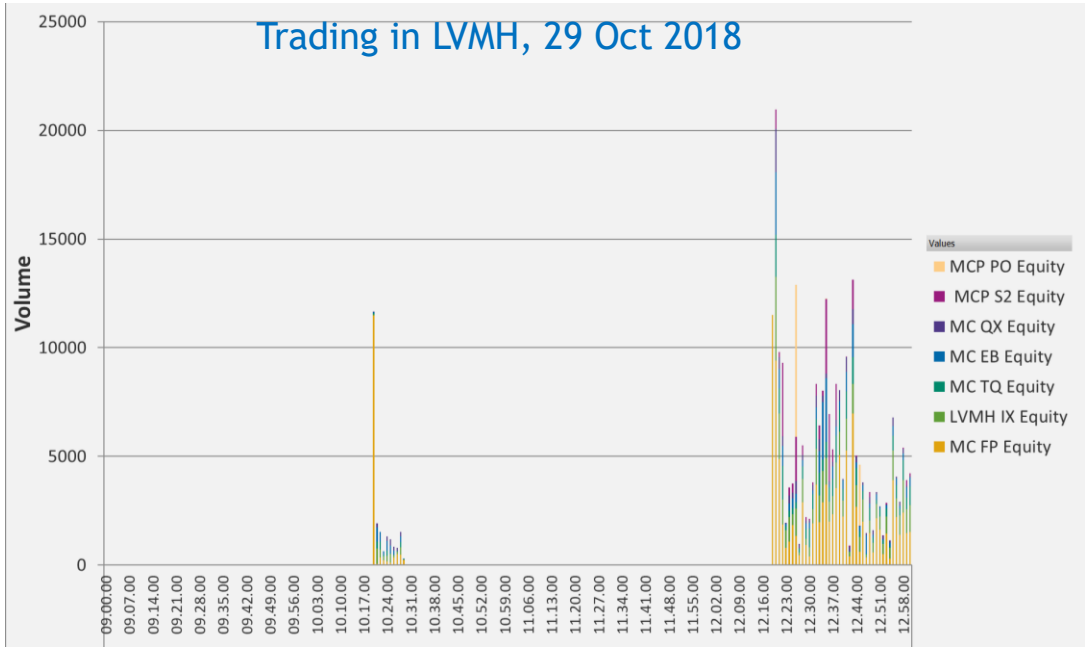
- The increase in fragmentation post MiFID II have moved more trading to private pools of liquidity controlled by investment firms that have, in their SI capacity, the ability to choose who they are trading with and adapt their prices and quoted volume depending on the type of client. As orders move to SIs for execution rather than participate in price formation on regulated markets, prices of regulated markets become gradually less representative and relevant. If this development continues it will impact the current function of the market with fair and non-discriminating trading conditions. The European price formation will then be hindered and the quality of the financial market as a whole will be degraded by more opacity and less efficiency. Uncertainty of the price formation process could hurt investors' confidence and willingness to invest in equities, which in the end impacts companies' ability to raise finance on the public market.



Trading venues importance for price formation

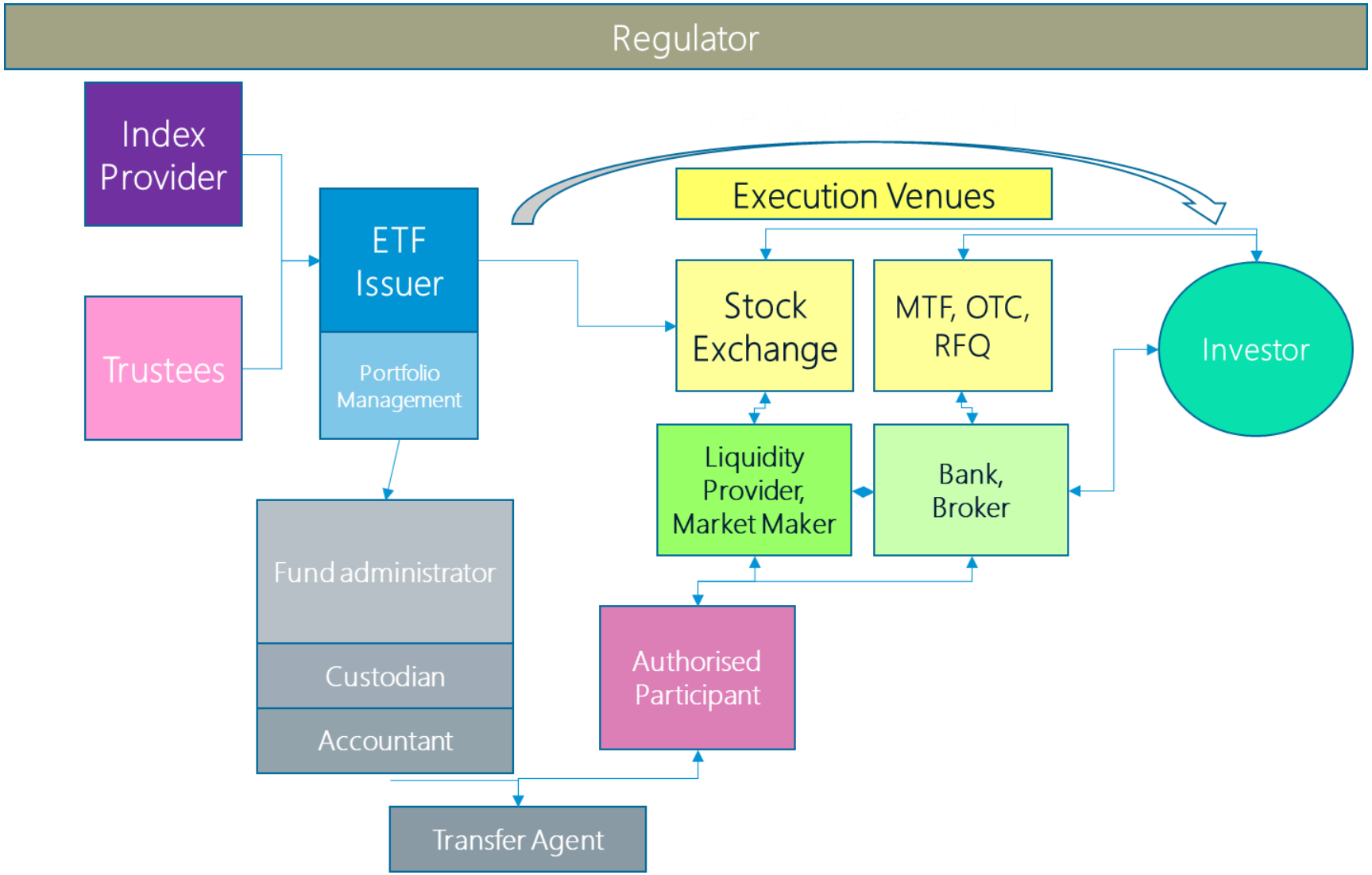
The transparency and non-discretionary access that primary markets provide is geared towards forming prices for execution and the possibility of interaction of orders in a fair and orderly manner. Regulated markets have therefore for long been considered as the main contributor to the price formation in the market and the most reliable benchmark for conducted transactions. Regulated markets importance for the price formation and the functions of other trading systems is well demonstrated during a couple of primary market outage (Nasdaq the18th of April and Euronext the 29th of October) where trading was halted at the primary market.





The absence of trading on other execution venues like MTFs and SIs, during these events illustrates the crucial function primary market currently have for the liquidity in the market. The charts, displaying trading in selected shares on Nasdaq Stockholm and Euronext, also provide evidence that most execution venues use primary exchange's market data as reference for their prices and quotes.

ETF Ecosystem



ETF Ecosystem

- **Market makers**, who may or may not be Authorized Participants, price out the iNAV of the ETF throughout the trading day and make 2-sided markets on the exchange (secondary market) based on that valuation.

- **Authorized Participants** (AP) are institutions (banks, market-makers or brokers) that have the exclusive right to create or redeem shares of an ETF directly with the ETF issuer at NAV. This is known as the primary market.

- Supply and demand in the secondary market may cause an ETF to trade above (premium) or below (discount) it's INAV. This presents an arbitrage opportunity for the MM, which in turn, keeps the ETF trading at or close to fair value.

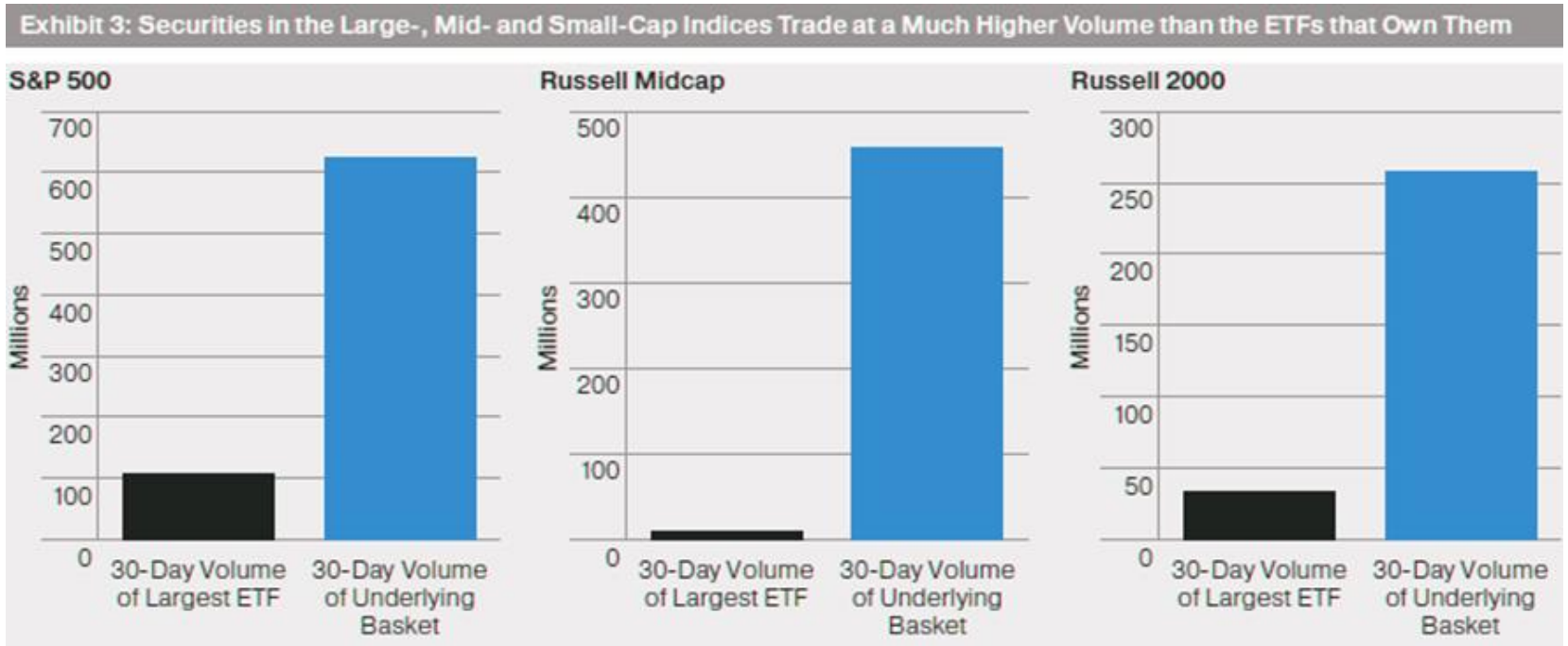
  - ✓ Premium/Creation: MM will sell shares of the ETF at a premium in the secondary market, while simultaneously buying/borrowing the underlying basket at FV. MM will deliver the basket of securities to the issuer and receive new shares of the ETF via the primary market. **CREATION**

  - ✓ Discount/Redemption: MM buys shares of the ETF at a discount, and delivers those shares back to the issuer, who will in turn, deliver the basket of securities at FV. **REDEMPTION**

ETF - Focus on liquidity

- Average daily volume (ADV) alone is insufficient when determining the liquidity of an ETF since market makers can access the underlying securities to facilitate trading

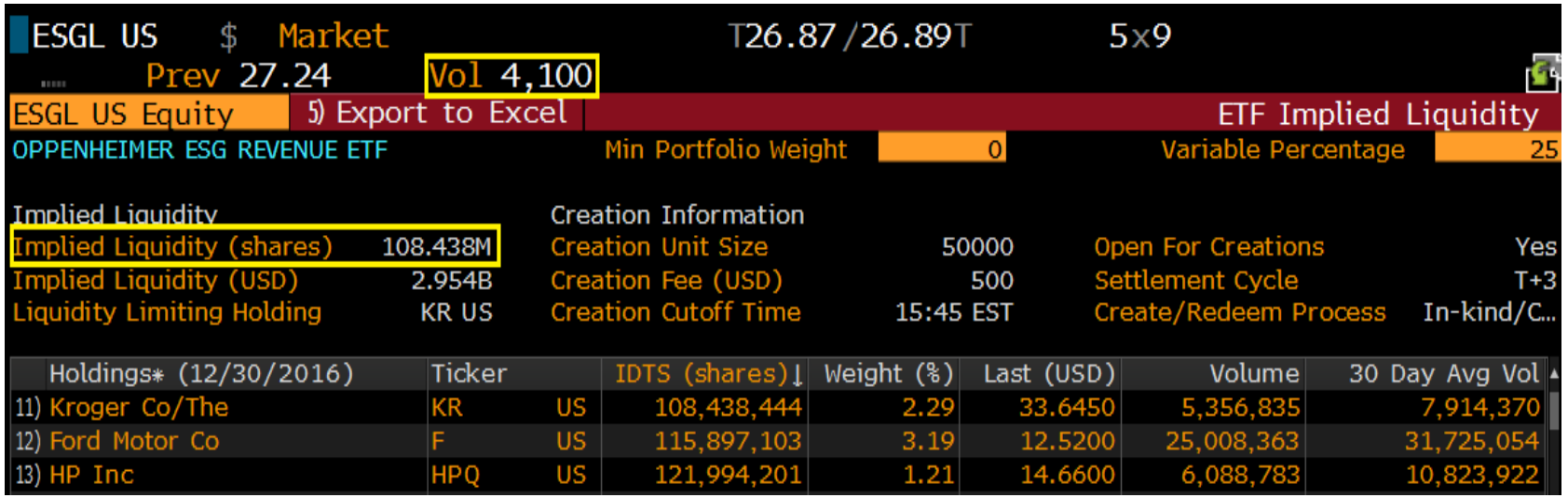
- The liquidity of the underlying basket of securities is highly relevant in determining the liquidity of an ETF



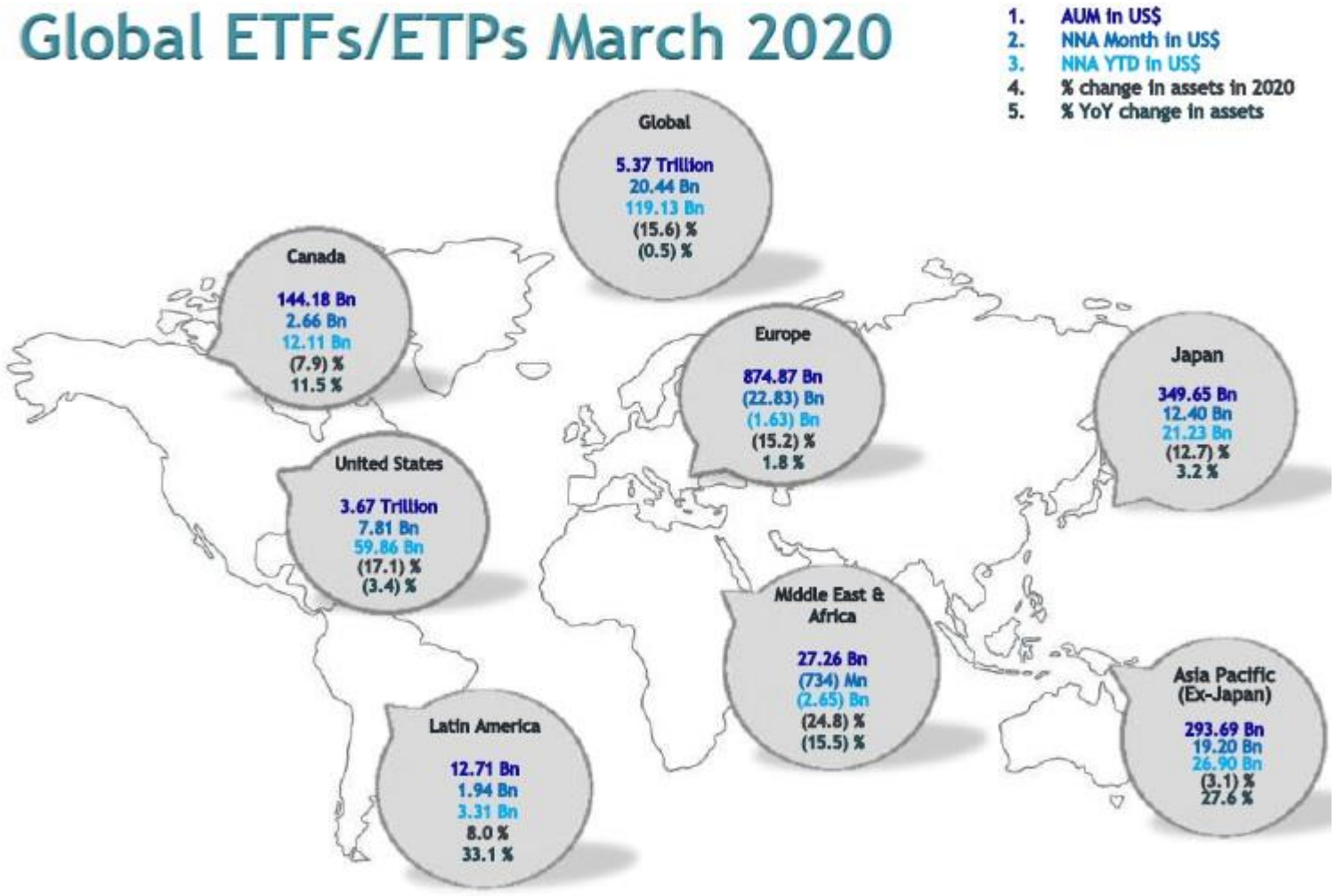
ETF - Focus on liquidity

- Implied liquidity is a daily representation of how many shares of an ETF can be created by accessing the underlying securities.

- On the below example, a market maker could create an additional 108.4M shares with a notional value of approximately $2.9B before reaching 25% of any of its underlying securities' 30 day average daily volume (ADV).



Evolution of ETFs



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