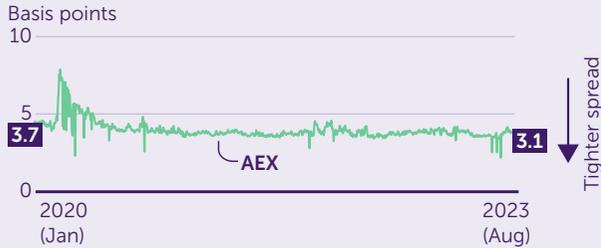
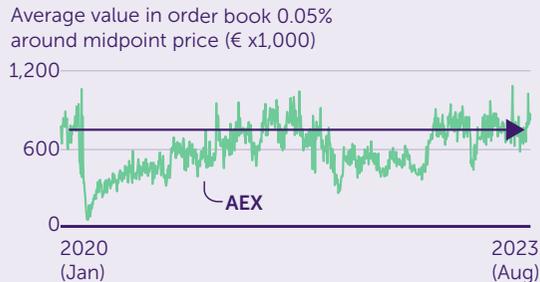


Equity markets

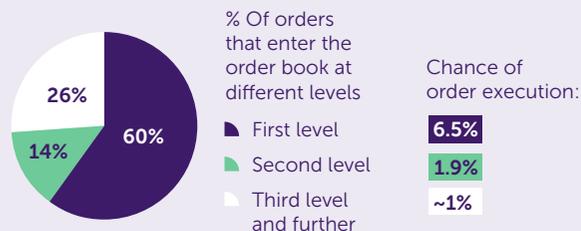
Tighter bid-ask spreads in large stocks ...



... but not necessarily deeper order books ...



... where a large percentage of the orders have a low probability of execution.



Fixed income markets

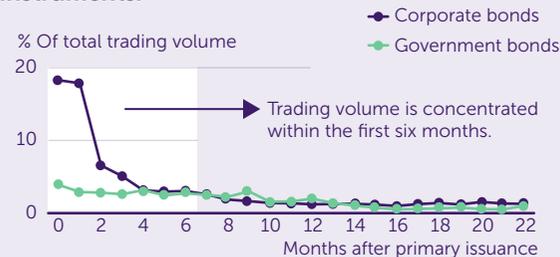
Corporate bond financing is increasing in the Netherlands ...



... but the EU and the Netherlands remain reliant on bank finance.

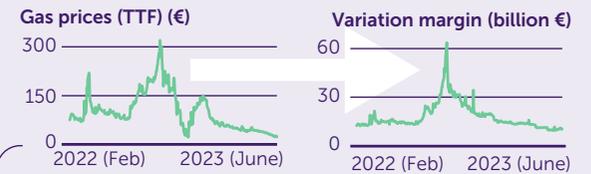


Corporate bonds are primarily buy-and-hold instruments.

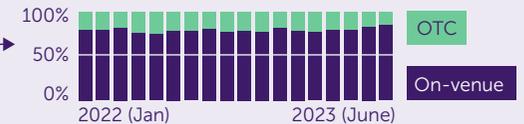


Commodity markets

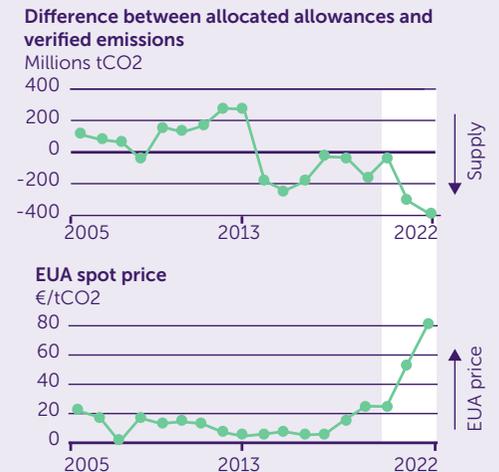
Lower TTF gas prices in 2023 implied lower margin requirements ...



... and despite the turmoil in 2022, on-venue trading remained stable.

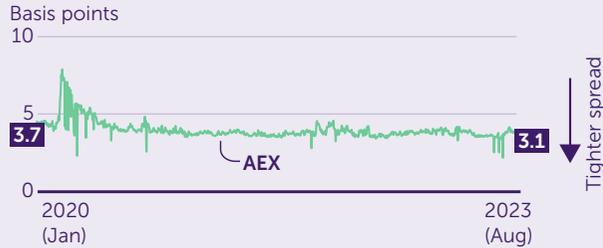


Lower supply of emission allowances drive the EUA price higher.

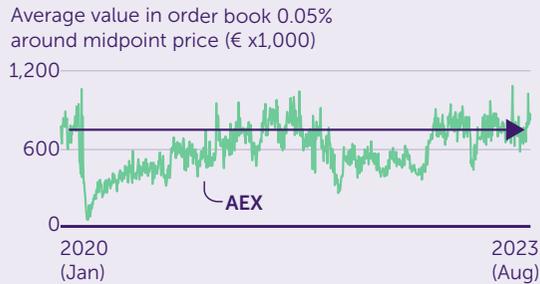


Equity markets

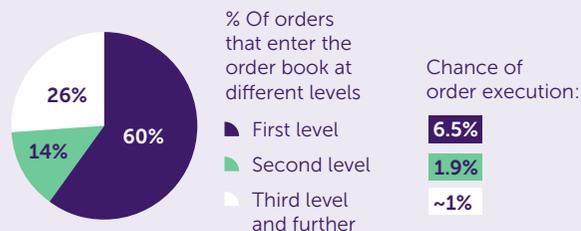
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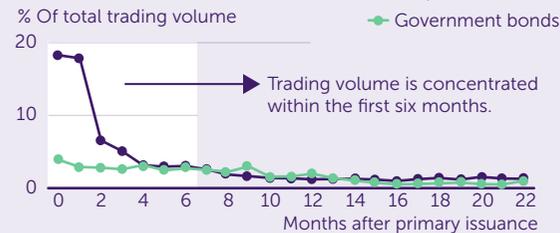
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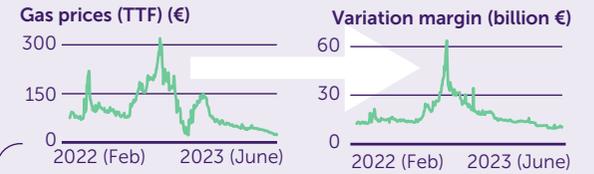


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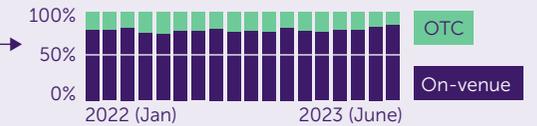


Commodity markets

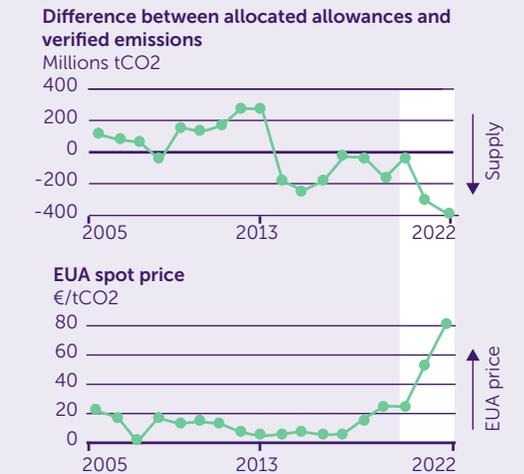
Lower TTF gas prices in 2023 implied lower margin requirements ...



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Lower supply of emission allowances drive the EUA price higher.



Summary

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The State of the Capital Markets provides a long-term view of market developments. The observations reflect the AFM's role and our perception of capital markets.

In equity markets we observe...

That the number of IPOs has decreased in European and US public equity markets after the fading popularity of SPACs [1](#). Option market volumes in Europe remain constant, while increased retail activity in equity markets has led to a surge in options trading in the US [2](#). Dutch equity markets are becoming more international [3](#). Bid-ask spreads in secondary markets have become tighter, but these narrow spreads are mostly reflected in large stocks [5](#). These narrow spreads do not necessarily reflect deeper order books [6](#). A large percentage of the orders placed in the market do not directly support market liquidity, as they have a low probability of execution [7](#). Circuit breakers automatically provide an emergency brake in case markets become turbulent, safeguarding an orderly price discovery process. This feature is triggered more often in markets that are less liquid [8](#). Trading and market making are largely automated [9](#), with a wide variety of algorithms supporting the financial ecosystem [10](#).

In fixed income markets we observe...

That market finance is still relatively underdeveloped in the EU compared to the US and the UK [11](#), but participants increasingly find each other directly through financial instruments. Markets offer competitive rates for both savers and borrowers [12](#). After Brexit, the number of foreign entities whose bonds are traded in the Netherlands increased significantly [13](#). Although participation in corporate debt markets shows an upward trend, it is still primarily a buy & hold market. Liquidity is concentrated in the months after primary issuance [14](#). Secondary market transactions are increasingly conducted on multilateral trading venues [15](#). But the full potential of liquid debt markets, with the narrow spreads found in equity markets, has not yet been achieved [16](#). Trading activity on repo

markets ceases temporarily at year-end [17](#). In this institutional market we observe that interest rate derivatives (IRDs) account for a large part of the total notional derivative positions [18](#). The transition towards central clearing of these IRDs continues as the exemption for pension funds on the clearing obligation has expired [19](#). Most of these Euro contracts are still cleared in the UK [20](#).

In commodity derivatives markets we observe...

That the most important gas hub in Europe is located in the Netherlands and the price of gas differs across regions [21](#). Trading activity in TTF gas futures decreased during the run-up to the price peak in 2022 [22](#). On balance, NFCs usually have long positions, while investment companies are short to a greater extent [23](#). The extreme gas price in 2022 was accompanied by a sharp increase in margin requirements [24](#). The volume of margins has returned to pre-crisis conditions, without material impact on the choice between OTC or on-venue trading [25](#). Overall, trading in TTF futures is concentrated in shorter maturities [26](#). The pricing in futures with longer maturities suggests the expectation of a higher gas price in the coming two years [27](#). Since 2020, the EUA price has increased significantly, due to restricted supply of allowances [28](#). The volume traded in EUAs shows an upward trend over the longer term [29](#). Bid-ask spreads in EUAs are lower than in TTF futures in the most frequently traded instruments. Spreads appear to have widened in both commodity types since 2021 [30](#).

About the State of the Capital Markets

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The State of the Capital Markets is a publication from the Dutch Authority for the Financial Markets (AFM). This is the second edition, building further on the first report released in 2022.

Why this publication?

This publication is a means of sharing our observations on important developments in the capital markets. These observations are partly based on the unique data set supplied to us by market participants. These data reports are important to us, as we use them on a daily basis to monitor markets, detect risks and investigate possible violations.

The AFM has the ambition to become a **leading data-driven supervisory authority**.

This means that we are developing the capacity to analyse large quantities of electronic data to support staff in supervising capital markets. To do this effectively, we need, amongst other things, the ability to process and verify the quality of this data. Realising this ambition is a challenge and a work in progress. Our data position is not yet flawless, nor is our ability to automate the processing and analysis of large data sets. We will continue to work hard on this strategic priority in the coming years. We expect our progress to be reflected in future AFM publications.

For whom is this publication intended?

This publication is intended for a wide audience. It is most relevant to professional market participants, journalists, interested retail investors and students. This publication is more technical than most AFM publications.

What can you expect?

The State of the Capital Markets consists of a series of graphs depicting various aspects of equity, fixed income and commodity markets. We offer observations for each graph. These observations are concise and intended to be as objective

as possible. The graphs address parts of the capital markets. With our selection of graphs, we try to balance the international nature of these markets with specific interest from a Dutch regulatory perspective. First, we introduce a summary of our observations. Before discussing the state of the equity, fixed income and commodity markets, we offer a brief overview of the importance of capital markets, the role of the AFM and future priorities. We end with some information on methodology, data sources and margins of error.

The importance of capital markets and the role of the AFM

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Capital markets help finance the economy and reduce financial risks. Capital markets bring together capital and investments in a price formation process. Money needed to build a new factory can be raised (for example) through banks or by issuing public securities. Transferable securities are designed to allow investors to retrieve invested funds on demand (e.g., by selling them on a stock market). This ability to exit before maturity reduces the risk for investors and lowers the cost of capital for the primary issuer. Ensuring that the price formation process in these secondary markets is fair, transparent and orderly is an important responsibility of trading venues. Sometimes market participants want to transfer specific elements of financial risk related to these equity or debt securities. For this purpose, derivatives allow to transfer part of the risk to another party. Commodity derivatives markets, for instance, allow producers to lock in future prices by selling their future produce. In this way, derivatives markets can reduce overall risk and support investments in the real economy.

Capital markets benefit from regulation. There are several reasons for the substantial amount of financial regulation that is currently in place. First, capital markets are entrusted with the collective savings of the public and the public should be able to trust that money is handled in a fair and orderly manner. This trust cannot be taken for granted. Second, fair and efficient capital markets cannot be presumed to exist, because not all interests are aligned. Markets can derail and require supervision to ensure that market participants adhere to legal standards on transparency and fair access. Third, regulation can stimulate the establishment of a European Capital Markets Union, allowing capital markets to benefit from economies of scale and scope. Fourth, regulation of the capital market is a means of helping to achieve other important policy goals, such as the green transition of the European economy.

Capital markets are closely supervised by the AFM. The AFM ensures that capital markets operate in line with regulation and the principles of fair, transparent

and orderly markets. Together with ESMA and its European partners, the AFM cooperates to establish effective cross-border oversight to fulfil its supervisory responsibilities. The digital transition of the marketplace especially and, to a lesser degree, the development of markets in commodity derivatives and EUAs (carbon allowances) affect the role and responsibilities of the AFM as Brexit did in the recent past. New skills, expertise, and a certain nimbleness are required of the AFM when adapting to these changing markets.

AFM priorities for the next few years

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The AFM is committed to promoting fair, transparent, and orderly capital markets. As an independent market conduct authority, we contribute to sustainable financial well-being in the Netherlands. Below we highlight a few topics within these three focus areas that will receive particular attention in our capital market supervision in the coming years.

1. Fair

The digital age has reshaped traditional physical marketplaces. The consequent transformation of market dynamics has led to substantial adjustments in the regulatory framework to safeguard core standards of fairness. The AFM aims to ensure that digital marketplaces continue to bring together trading interests in a fair and efficient manner. One tangible illustration of this area of attention is the trading venue perimeter. This delineates the circumstances under which MiFID rules for secondary markets are applicable. The AFM is engaged in close cooperation with the European Securities and Markets Authority (ESMA) and other national competent authorities to ensure markets are fair. Another example is our bolstering of cross-border surveillance systems to counter and deter market abuse at the international level. Additionally, the AFM monitors over-the-counter (OTC) markets to detect any signs of market abuse or activities that could compromise market integrity and transparency.

Moreover, we will ensure that financial markets remain a level playing field for all participants by closely monitoring the compliance of market participant with regulations such as those governing non-discriminatory access in securities markets. To further improve our understanding of this evolving market, we have initiated collaborations with universities for in-depth research.

2. Transparent

Internationalisation and ongoing integration in the European Capital Markets Union have expanded the borders of financial markets far beyond national confines. In this international environment, maintaining the integrity and transparency of

markets is paramount.

We remain steadfast in our commitment to ensure that public data meets stringent standards and provides reliable information to market participants. Particular attention will be devoted to the monitoring of ESG information in our transparency supervision. Recent EU laws mandate ESG transparency for most elements in the information chain between the issuer and the investor. We are not blind to the incentives for greenwashing that this transparency push will create, nor to the many interdependencies in the information chain. We thus continue to combine the monitoring of concrete ESG disclosure rules with a holistic view of the capital markets and sustainable finance.

3. Orderly

Safeguarding critical infrastructure is the third dimension of our focus, particularly in the realm of cybersecurity. Critical components of financial markets, including trading venues and post-trade facilities, now operate almost completely in a digital environment. Consequently, these entities are vulnerable to various cyber threats. Furthermore, the proliferation of algorithmic trading (algo-trading) has the potential to disrupt the orderliness of markets. To better comprehend and manage the risks associated with algo-trading, the AFM is investing in research and development efforts. An illustrative example of our focus on this area is the research on pre-trade controls, conducted in collaboration with ESMA and other National Competent Authorities (NCAs).

To address the need for market participants to adhere to high standards for mitigating cybersecurity risks, new regulations such as the Digital Operational Resilience Act (DORA) further empower the AFM to ensure the operational resilience of markets and minimise downtime. The AFM is committed to ensuring that operational risks are effectively mitigated to strengthen the resilience of financial market infrastructure in close cooperation with the Dutch central bank (De Nederlandsche Bank, DNB).

Equity markets

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Equity markets are a **meeting point for sellers and buyers of shares**. They are marketplaces for raising capital and provide investment opportunities. Shares are issued in the primary market, where a distinction can be made between private placements and public listings. Investors can invest in equity directly by being invited to private placements, including through private equity funds, whilst investments in listed shares can be made through trading venues. Companies can become listed by issuing shares for the first time in an initial public offering (IPO). These are mostly facilitated by banks providing underwriting and administrative arrangements.

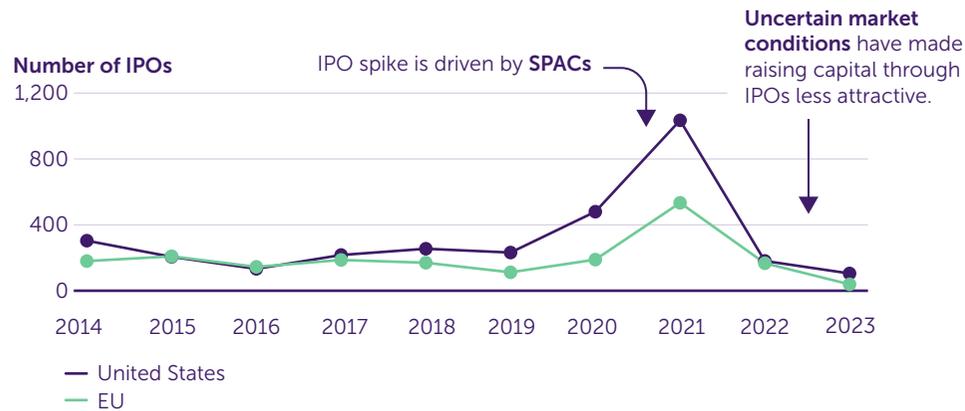
Once shares are listed, the trading venue facilitates a secondary market in which shares can be traded, as well as a broad range of derivatives, such as futures and options. Public equity markets are an essential part of a well-functioning market economy and provide both issuers and investors with lucrative opportunities to raise and invest capital. Secondary markets provide liquidity and promote efficient price discovery.

Equity markets are a **global business**. Trading venues compete with each other and with alternatives to the public market, such as private equity. Investors have multiple platforms to choose from when investing in or trading shares. Historically, Euronext Amsterdam is the main equity market in the Netherlands. Its best-known index is the AEX, which tracks the 25 largest and most frequently traded companies. Since Brexit, more platforms have been listed in the Netherlands. Equity markets can be characterised as largely **electronic, highly dynamic, international, super-fast and data-rich markets**. The AFM has adapted and intensified its supervisory approach to reflect this challenging environment.

The following graphs give an indication of the development of equity markets in terms of funding, volatility, trading and liquidity.

Decreased IPO activity after SPAC boom

1



Source: FESE (Europe), StockAnalysis.com (US), and AFM registers

This graph shows the number of initial public offerings (IPOs) in the US, Europe and the Netherlands. High stock market valuations and the emergence of Special Purpose Acquisition Companies (SPACs) caused a **peak in the number of IPOs** in 2021. That spike, driven by the popularity of SPACs, was most pronounced in the US, with 1,035 new listings compared to about half that number in the EU. Since 2022, lower valuations and uncertain market conditions have made raising capital through IPOs less attractive. The downward trend in primary equity is similar in the US and the EU, with numbers returning to the long-term average. In 2023, the term for most of the SPACs listed in 2021 will end. So far, only a fraction of these companies have achieved their purpose of entering into a listed business unit. Most SPACs have failed to live up to investors' expectations.

European equity option market volume falls behind US

2



Source: FESE (Europe) and OCC (US)

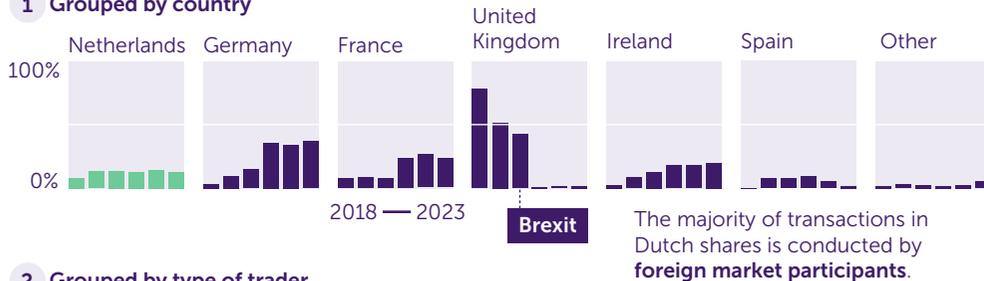
This graph illustrates the development of equity option volumes in Europe and the US. While trading activity in options in Europe has remained stable over the last ten years, the volume in the US has increased dramatically. The sharp **increase in options trading** started in 2020 and is largely the result of increased retail trading activity, especially driven by the introduction of **Zero Days to Expiration (0DTE)**. Fuelled by social media, trading in financial instruments in the US has flourished since Covid. Since then, trading in short-term options has more than doubled. The strong growth is most pronounced in the S&P 500 index, with more than 40% of the total volume consisting of 0DTE options. Trading in 0DTE options has so far been limited in Europe.

Dutch equity markets dominated by foreign market participants

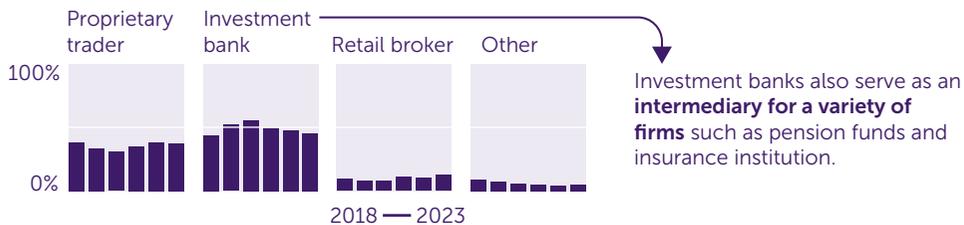
3

Transactions in Dutch shares per year (%)

1 Grouped by country



2 Grouped by type of trader



Source: AFM TRS data

This graph shows the percentage of transactions in Dutch shares per year, grouped by nationality of the market participant (1) and by type of trader (2). The majority of transactions in Dutch shares are conducted by **foreign market participants**.

From a supervisory perspective, this underscores the importance of **international cooperation** and supervisory convergence, a key item on the ESMA agenda. Furthermore, the graph shows that many foreign entities moved their domicile to continental Europe after Brexit.

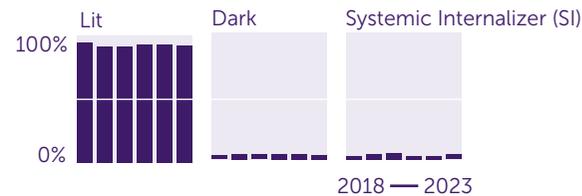
The bottom graph (2) shows that proprietary traders and investment banks account for more than **80% of all market transactions**. This is because investment banks, besides trading for their own account, serve as intermediaries for a variety of firms such as pension funds and insurance institutions. In addition, a significant portion of transactions of retail brokers and proprietary traders are facilitated by investment banks.

Vast majority of equity trades are lit

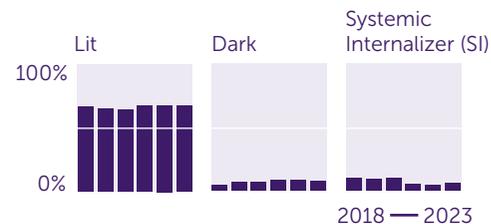
4

Transactions in Dutch shares per year (%)

3 Grouped by type of trading venue (retail)



4 Grouped by type of trading venue (institutional)



Lit: High transparency, show bid/ask prices and the total number of shares.

Dark: Less transparent, allow traders to make block trades without publishing the buy/sell price or the number of shares traded.

Source: AFM TRS data

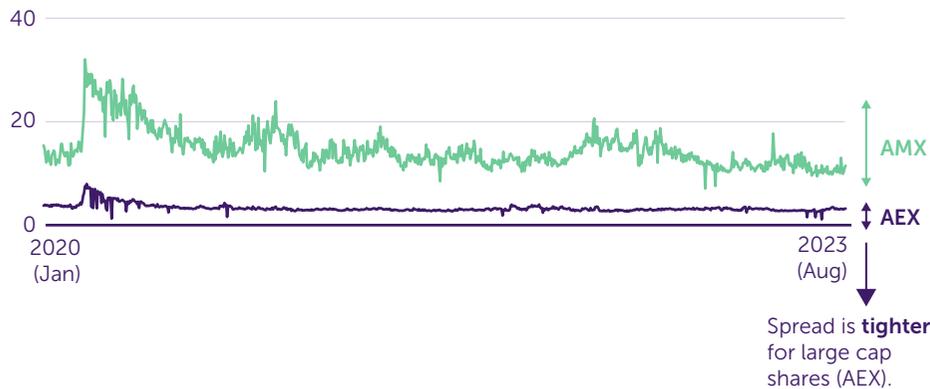
This graph shows the relative number of Dutch shares that are traded through either a **lit or dark order book** for both retail and institutional investors. A trade is considered lit if it satisfies certain pre- and post-trade transparency requirements. Dark trades are generally less transparent, but they fulfil a crucial role by allowing (institutional) entities to conduct certain block trades without affecting market prices significantly.

Dark trades account for roughly 10% of the institutional transactions and have remained stable since 2021. The share of lit transactions ranges from around 85% for the institutional segment to 95% for retail investors. The share of transactions on venues classified as systemic internaliser (SI) is less than 5% of the total, having decreased since 2020.

Narrow spread for large-cap stocks

5

Average bid-ask spread
(basis points)



Source: AFM Euronext order data

This graph shows the average spread in basis points for a selection of AEX and AMX shares traded on Euronext Amsterdam. The spread is significantly **lower for AEX shares than for AMX shares**. The trading activity in stocks included in the AEX is larger. Higher trading volume is usually associated with a lower spread. The tightness of the bid ask spread may be impacted by the activities of **High Frequency Trading (HFT)** firms. A characteristic of some HFT strategies is to be present at the “touch” in the order book. Touch trading builds on short-term (fractions of a second) predictions of the market price, driving a lower spread between bid and ask. In AMX stocks the activity of HFT trading firms is significantly lower. Trading volume, HFT activity and average spread appear to be connected. A tight spread may reduce trading cost but is not necessarily a reflection of actual market liquidity. The depth of the order book also needs to be considered.

Depth of order book at pre-Covid levels

6

Average value in order book 0.05%
around midpoint price (€ x1,000)

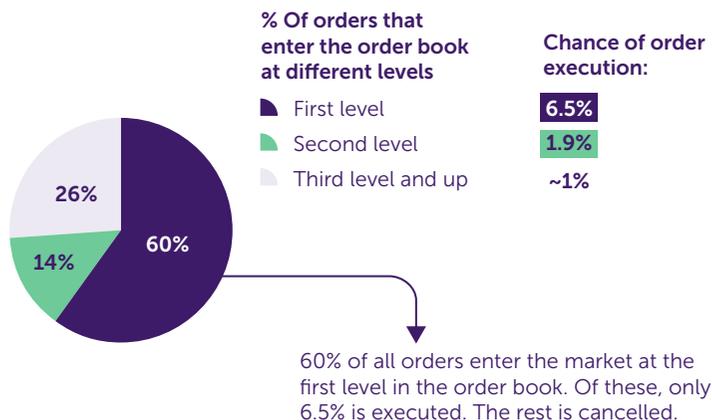


Source: AFM Euronext order data

This graph shows the depth of the order book. It is based on the average value of the orders resting in the order book for a selection of AEX and AMX stocks on the regulated market near the midpoint of the order book. The value of the resting orders around the midpoint price – like the average spread – is an **indicator of the liquidity of a stock**. A stock is more liquid if more volume can be traded without moving the price. We observe a significant difference in value quoted between AEX and AMX stocks, suggesting that **AEX stocks are far more liquid**. In March 2020, there was a sharp decline in liquidity. Since then, the first layer of the order book has improved, as the depth of the order book has reached pre-Covid levels. Orders in the order book do **not necessarily reflect higher liquidity**. In the current market structure, dominated by algorithmic trading, the levels further away from the midpoint price seem to play a marginal role in the price discovery process (see graph #7 for an in-depth analysis of the order book).

Vast majority of orders cancelled before execution

7

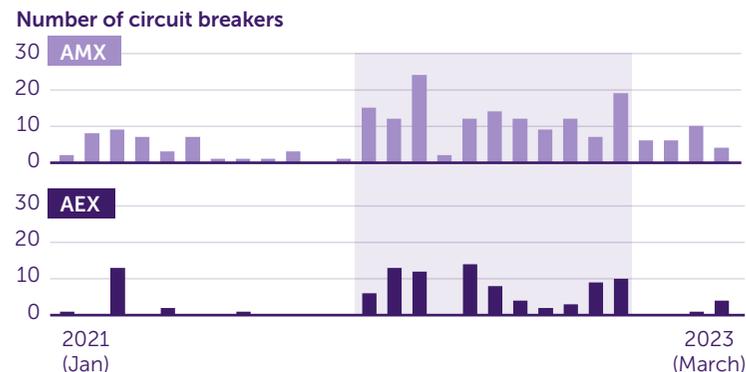


Source: AFM Euronext order data

This graph shows the likelihood of execution for orders at various levels from the best bid or offer at the time of market entry. The graph is based on the "normal" markets including the Retail Liquidity Provider (RLP) Programme, on which only retail clients are able to trade on quotes sent in by liquidity providers. The order book may be viewed as a fluid indication of the pricing mechanism, which is constantly influenced by all possible sources of information. Most inserted orders **expire or are cancelled** before a possible match can occur. The order-to-trade ratio is high. Even if 60% of the orders are entered at the first level in the order book, only 6.5% of these orders lead to a transaction. The vast majority of these orders are cancelled, generally within a split second after being inserted. As suggested in the previous graph, it appears that order books are dominated by **algorithmic trading strategies**. The low likelihood of execution raises the question of why so many orders are being inserted at levels far from the midpoint.

Trading halts linked to spread and depth of order book

8



Source: Euronext transaction data, Bloomberg

This graph shows the number of circuit breakers triggered on Euronext Amsterdam for AEX and AMX stocks. Circuit breakers are more often applied during episodes of elevated market volatility. Trading venues are **legally required to have circuit breakers** in their trading systems. Circuit breakers essentially act as an emergency brake that is automatically triggered when the price of a financial instrument suddenly experiences a steep rise or fall. Once the emergency brake is triggered, trading in the specific instrument is paused. The number of trigger incidents has been much larger for AMX shares than for AEX shares. A lack of depth near the midpoint price for AMX shares means that a circuit breaker is more easily triggered when there is sudden directional news or a large order. The **increasing use of order execution algorithms** has probably had a dampening effect on the number of trading halts over past years, as order execution algorithms can "split" and execute large orders more efficiently.

Majority of equity trades executed by algorithms

9

Algorithmic trading (%) in Dutch equity financial instruments



Source: AFM TRS data

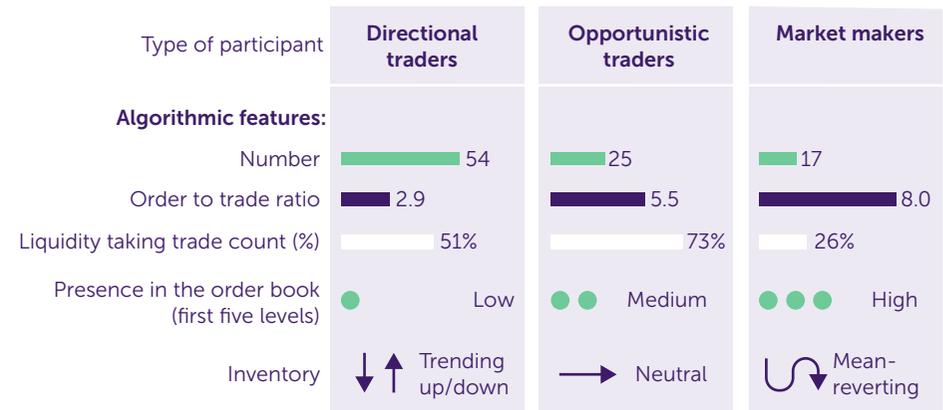
This graph shows the share of manual and algorithmic equity trading on the regulated market in the Netherlands. The graph is based on the **transactions as reported by the market participants**. All reporting entities are obliged to indicate whether transactions are executed by a trading algorithm or otherwise. It shows that in recent years the percentage of algorithmic trading was around 75%. In early 2021, the percentage of manual trading increased, probably due to an **increase in retail trading activity**.

It is important to distinguish between algorithmic proprietary trading and algorithmic execution of client orders. Many trading firms use algorithms for their trading activities. These algorithms are programmed to **initiate and execute trading strategies** based on a range of predefined parameters. On the other hand, many broker firms use algorithms to execute client orders. These algorithms are usually programmed to split a large order to limit the impact on the market price.

Not all trading algorithms are the same

10

Trading algorithms used in the ASML share: grouped by type of participant



Source: AFM Euronext and transaction data

This graph shows features of algorithmic trading in the ASML share in the period October 2021 to November 2022. Distinctive trading algorithms lead to specific trading patterns. Some trading algorithms tend to provide liquidity in the order book in a balanced way. Most tend to choose direction, accumulating or decreasing inventory during the day. **Directional traders** have a relatively low order-to-trade ratio and choose direction (buy or sell). **Market makers** have a high order-to-trade ratio, a large and balanced presence in the order book and a tendency to mean-revert their inventories down to zero. **Opportunistic traders** act as a blend of the other two clusters. Algorithms shape the order book, catering for the pricing mechanism of financial instruments. To better understand the dynamics of algorithmic trading, the AFM engages in research together with industry and academia. See for instance 'Statistical Predictions of Trading Strategies in Electronic Markets' by Álvaro Cartea et al. (SSRN, 2023).

Fixed income markets

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Fixed income is the **largest of the three market segments** in terms of positions and vital to the efficient functioning of the economy. Funds for investment opportunities are provided through bank loans and securities such as bonds and other debt instruments. Securities allow investors to retrieve their money before maturity of the loan by selling it in the secondary market. This market financing solution reduces the European dependence on bank finance and offers a broad range of financial instruments that can help corporates, households and government institutions with their funding and cash management needs. The vast size of investments in fixed income has resulted in a broad diversity of specialist financial services, including benchmark providers and rating agencies.

There is **little retail participation** in fixed income securities compared to equity. Fixed income markets are used predominantly by banks, pension funds, insurers, investment funds and central banks. These markets mostly operated on the basis of bilateral request-for-quote (RFQ) protocols with limited transparency, but the growing use of electronic systems has stimulated a transition to more competitive multilateral market structures.

Central clearing promotes transparency and liquidity in the derivatives markets, as contracts are standardised and participants have a single counterparty. At the same time, the **transition to digital representations** of assets may lead to potentially disruptive change in the financial infrastructure.

Since Brexit, the majority of the European trading venues that offer fixed income instruments have been **located in the Netherlands**. As a supervisor of fixed income markets, the AFM is developing innovative ways to stimulate a fair and transparent marketplace that allows investors and those who seek funds to meet in the most efficient way.

The following graphs provide an overview of the development of fixed income

markets including trends in volumes, rates, liquidity, trading channels, participants and positions.

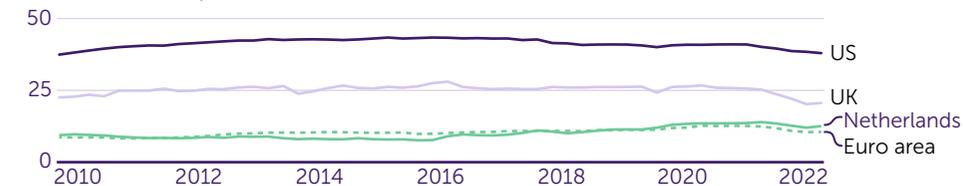
EU remains reliant on bank finance

11

Outstanding debt securities non-financials (€ bln)



% Market finance by non-financials



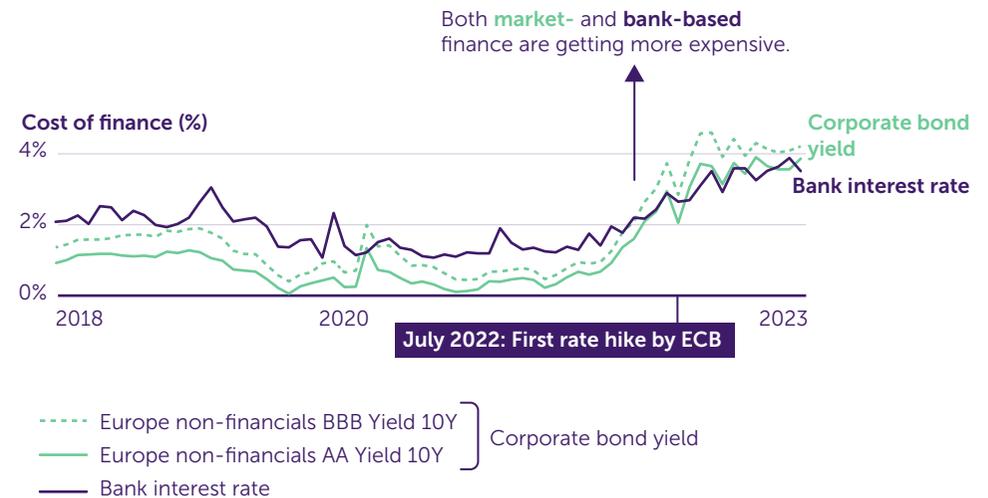
Source: BIS, Macrobond, AFM

The upper graph shows the total amount in EUR of debt securities outstanding for non-financial corporates in the Netherlands. This funding channel has become more attractive over the past decade, amid low interest rates and strong economic prospects. A **significant increase in outstanding debt instruments** was recorded during the Covid-19 pandemic. The lower graph shows the percentage of funding raised in the capital market by non-financials in the US and Europe.

Market-based funding is much larger in the US than in European countries. In the Netherlands, this market funding ratio was just below 13% in 2022, increasing slowly from some 10% in 2010. It is now above the average market financing in the eurozone. The European Union's ambitions for the Capital Markets Union include higher levels of market-based funding. **A more vibrant market** for debt instrument investments provides economic benefits and lowers systemic risk.

Capital markets rates compete with bank financing

12



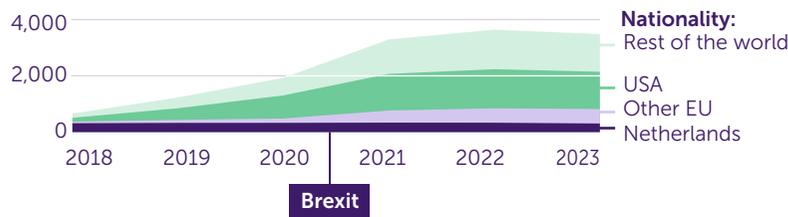
Source: Bloomberg and DNB

This graph shows the financing cost for non-financial corporates, comparing long-term interest rates of bank loans with bond yields of different credit quality. The **cost of finance has risen sharply** as a result of higher interest rates and more challenging economic conditions. Firms with a relatively higher risk profile (rated BBB) pay more than lower risk firms (rated AA). The difference between the bond yield and the risk-free interest rate is referred to as the '**credit spread**', reflecting a liquidity premium and default risk. The graph shows that bank-based finance has been more expensive than market-based finance over the past decade. Banks need a premium on their cost of capital and often require some form of collateral. In return, they offer advantages such as lower transparency-related costs. The availability of market finance is usually **more affected by market shocks** than bank lending. Currently, the financing costs through market-based finance are higher than for bank lending.

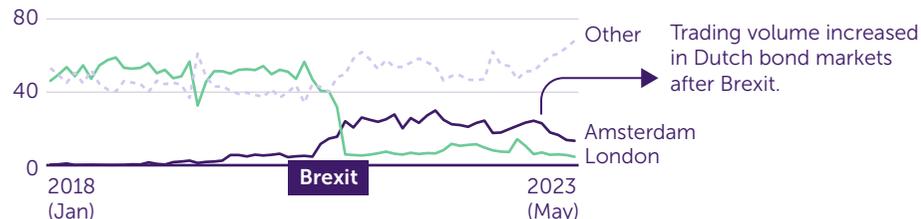
Foreign bonds increasingly traded in the Netherlands

13

Number of corporates that issue debt instruments in the Netherlands



% Of Dutch instruments traded in Amsterdam and London



Source: AFM TRS data

The top graph shows the nationality of corporates that issue debt instruments in the Netherlands (i.e., where the AFM is the relevant competent authority). While the number of **Dutch companies remains steady**, there is a notable uptick in trading in bonds issued by corporates of other nationalities. This may be attributed to the **relocation of UK trading venues** to the Netherlands following Brexit. The lower graph shows the trading locations for these Dutch financial instruments. In August 2020, approximately 56% of trades were conducted through London, with only 5% occurring in Amsterdam. Post-Brexit, London's share plummeted to 6%, while Amsterdam experienced an increase to 24%. Other European cities also increased their market share. For instance, the share of trading in Dutch corporate bonds through Rome increased from nearly nothing to 6%. Post-Brexit, the Dutch bond markets fulfil a **more international role**, reflected by the growth of international issuers as well as increasing trading volumes.

Corporate bond liquidity concentrates around primary issuance

14

% Of total trading volume in bond instrument

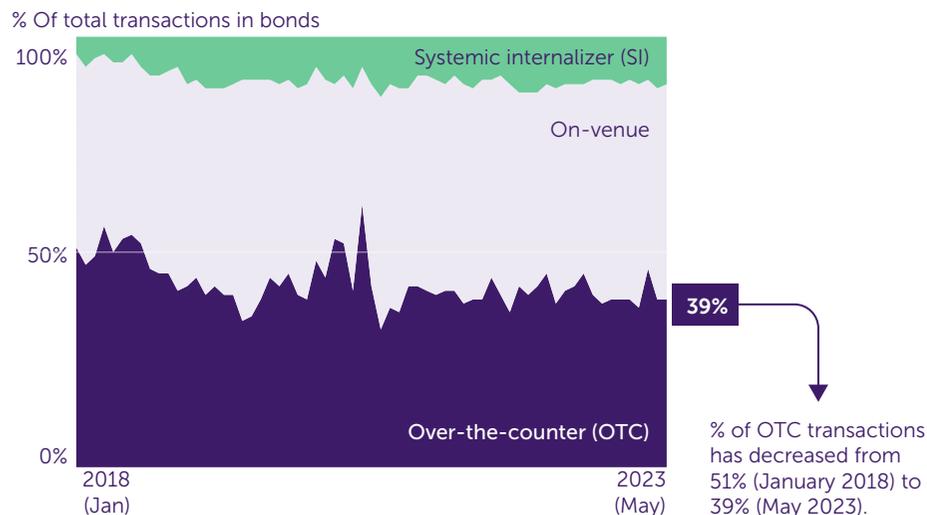


Source: AFM TRS data

This graph shows the development of trading volume for both corporate and government bonds. For corporate bonds, trading volume is **concentrated around primary issuance**, after which trading volumes steadily decline. During the initial weeks after listing, significant activity is observed among large institutional investors, which typically apply a buy-and-hold strategy. Their focus is on acquiring bonds that were not initially allocated during primary issuance. After a few months, bond trading activity is reduced and the liquidity in these instruments decreases substantially. On average, 55% of all trading during a corporate bond's lifetime is conducted within the first six months after issuance. By contrast, government bonds serve as instruments for risk management. Consequently, these bonds show a **continuous trading pattern over time**. The liquidity remains high for a long period after issuance.

Bond transactions predominantly on trading venues

15

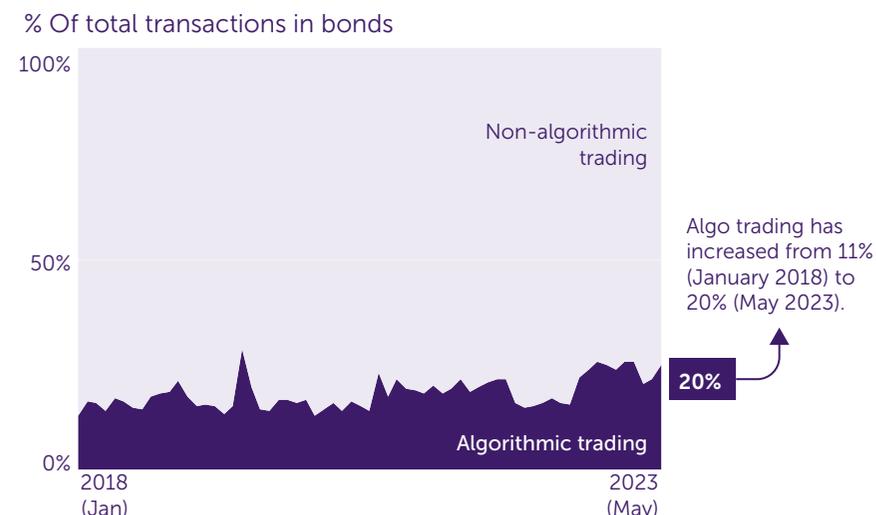


Source: AFM TRS data

This graph shows the percentage of bonds traded through different trading channels. Generally speaking, more than half of all bond transactions are conducted on RMs, MTFs or OTFs. After the financial crisis, regulation was intended to steer trading activity towards transparent and supervised trading venues. The data suggests that **bilateral over-the-counter (OTC) trading has decreased** from 51% in January 2018 to 39% in May 2023. A **further reduction is deemed desirable** and ESMA has recently clarified the rules and regulations on the trading venue perimeter. Since most investors hold corporate bonds to maturity, trading activity is concentrated around the primary issuance (see graph #14). Auctions are a common practice to allocate new securities to investors in the primary market. When investors want to trade large positions, they often prefer less transparent protocols such as Request-For-Quote (RFQ) over more open models such as auction and continuous order books.

More bond transactions executed by algorithms

16

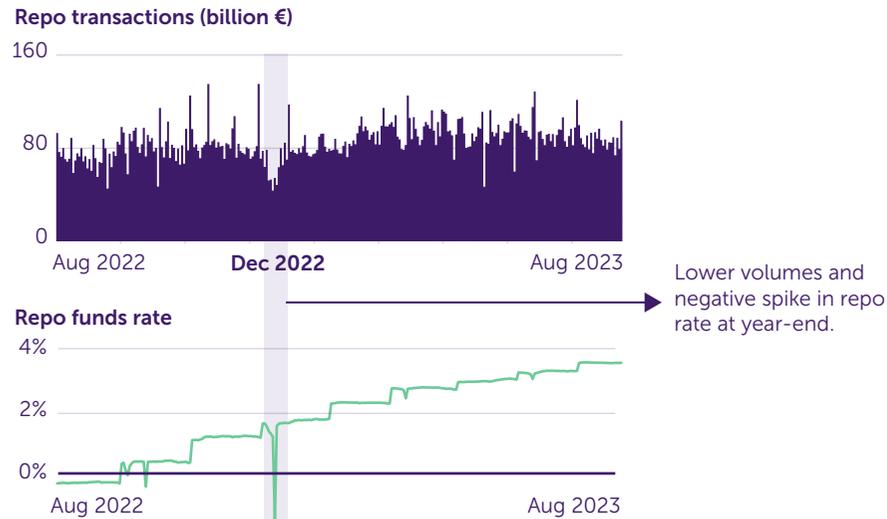


Source: AFM TRS data

This graph shows the development of algorithmic trading over time. The ratio of reported algo trades has increased from 11% in January 2018 to 20% in May 2023. Algorithmic trades are initiated by an algorithm programmed to execute trading strategies or orders based on predefined parameters. Algorithms are used, for example, on the dealer side to issue quotes on request or on the client side to execute investment decisions. The use of algorithms can **improve the liquidity and efficiency** of markets. However, the lack of centralised price information impedes the implementation of algorithms. Most non-algorithmic trades are conducted on electronic platforms **but involve manual confirmation** of orders. Trades conducted by telephone are a small portion of manual trades. Furthermore, it should be noted that reporting entities have different interpretations of what constitutes an algorithmic trade, so the percentages shown here may not provide an exact comparison.

Activity on the repo-market ceases at year-end

17



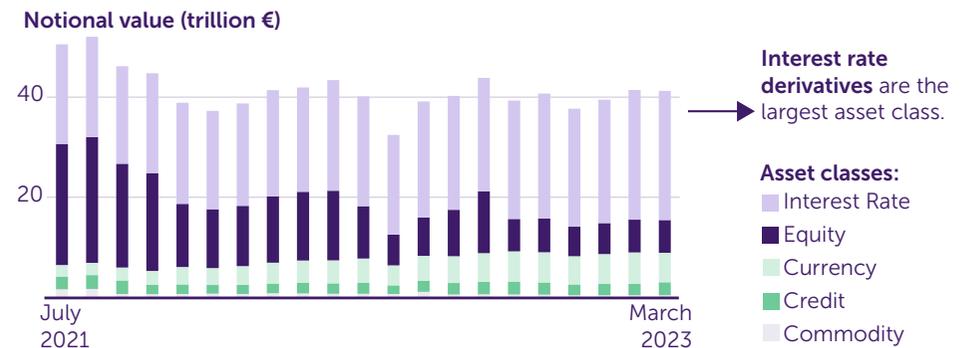
Source: AFM SFTR data, RFR, Macrobond

This graph shows the principal value of repurchase agreements (repo transactions) on one of the larger repo platforms. The blue line shows the repo funds rate, which is the (implicit) interest rate that is paid for repos between two parties. This interest rate increases in steps over time, reflecting the hikes in the policy rate of the European Central Bank.

The graph shows that **activity temporarily ceases in the repo market at year-end**. This is a result of banks shrinking their balance sheet with lower leverage on the reporting date. In the data, this is reflected in lower transaction volumes and a negative spike in repo rates. Although short-lived and predictable, this is clearly **a weak feature of the repo market**. It limits the possibilities for institutional investors to manage their liquidity efficiently.

Large positions in interest rate derivatives

18



Source: AFM EMIR reporting

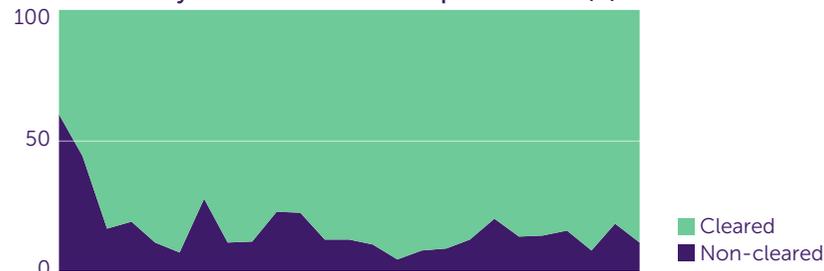
This graph shows the total notional value of derivative positions of Dutch investment firms broken down by asset class. While the total size of the positions (approximately EUR 40 trillion) has decreased somewhat since 2021, a more visible **shift in the composition across asset classes** has taken place. **Interest rate derivatives (IRDs)** are by far the largest asset class, with roughly two-thirds of the total notional value. IRDs are used, for example, by pension funds to hedge their interest rate risk. Remarkably, the equity derivatives segment has decreased in market size over the past two years. According to ESMA, the total size of the European derivatives market is around EUR 314¹ trillion in notional value. As such, the **Dutch market accounts for roughly 13%** of the total European derivatives markets.

1 Forthcoming ESMA derivatives market report.

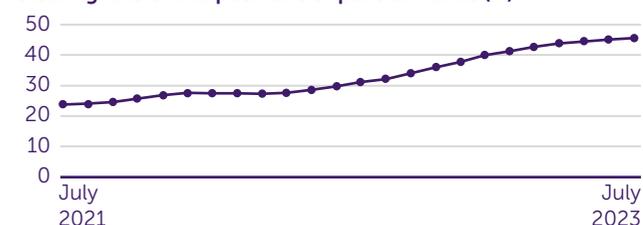
Majority of IRDs are cleared centrally

19

Share of centrally cleared trades in IRDs of pension funds (%)



Clearing rate of IRD positions of pension funds (%)



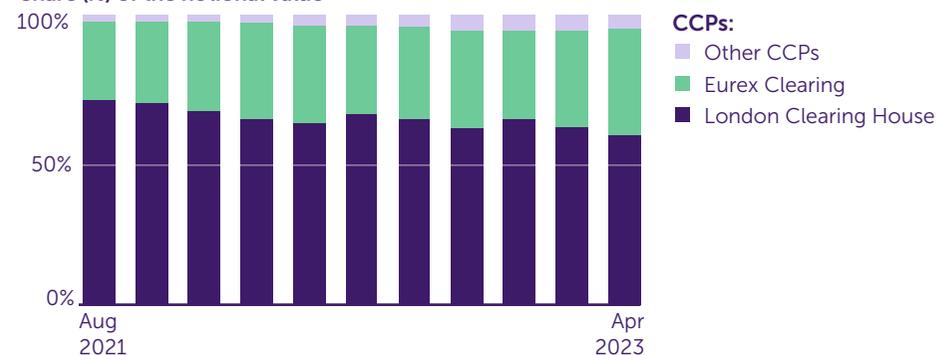
Source: AFM EMIR Reporting

The upper graph shows the share of centrally cleared trades in interest rate derivatives (IRDs) of Dutch pension funds (% of all new trades). The lower graph depicts the clearing rate of outstanding IRD positions of pension funds. The data is expressed as a percentage of the notional value of the underlying. The European Markets and Infrastructure Regulation (EMIR) requires investment firms to clear certain transactions in IRDs, including fixed-to-float swaps. **Pension funds were temporarily exempted from this obligation** until June 18th, 2023. The data shows that pension funds already cleared the vast majority of their derivatives in the months before the expiration of the exemption. Remaining non-cleared transactions do not fall under the clearing obligation, for example due to the limited position size. Due to bilateral contracts expiring and being replaced with centrally cleared contracts, we observe a **gradual transition towards cleared IRDs** over the last two years.

Concentration in clearing of IRDs

20

Share (%) of the notional value



Source: AFM EMIR Reporting

This graph shows the central counterparty (CCP) where the IRD transactions of Dutch pension funds are cleared. The data is expressed as a percentage of the notional value. The clearing of interest rate derivatives is **concentrated in two large CCPs: London Clearing House (LCH Ltd) and EUREX Clearing**. Although derivatives markets benefit from economies of scale, they also lead to political interdependencies and possibly financial stability risks. As most of the clearing of euro-denominated derivatives still takes place in London, benefitting from economies of scale, there is a risk for EU clearing members involved. In response to this, the European Commission has launched proposals to bolster the Capital Markets Union and wants to **increase the attractiveness of clearing euro contracts** in the eurozone to ensure the viability of European clearing institutions.

Commodity markets

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Commodity markets are places where market participants meet to buy and sell commodity products such as oil, gas, grain and emission allowances. Transactions are concluded through spot trades with immediate delivery and through financial instruments. The financial instruments used are physically settled futures contracts, which can be offset before maturity, and cash-settled futures contracts. Both types are also used by traders for hedging purposes.

A wide variety of entities trade on commodity markets, ranging from manufacturers and producers to proprietary traders and other financials. Commodity producers rely on financial instruments to reduce their exposure to the risk of falling prices. Banks and other market specialists intermediate between the supply from producers and the demand from consumers in a price formation process. The dedicated professional operation of commodity markets by independent third parties improves price discovery.

Most commodities can be bought or sold **on trading venues**, but some transactions are still **conducted off-exchange**. Trading on venues benefits both buyers and sellers, because prices are established in competition and economies of scale are achieved in standardised processing and settlement procedures. Appropriate management of counterparty risk is a major benefit of on-venue trading.

At the European level, the Netherlands is an **important trade hub for many energy-related commodities**, including natural gas traded on the Title Transfer Facility (TTF) and European Union emission allowances (EUAs). The gas crisis in 2022 had a large impact on real economic activity and society across Europe, making Dutch commodity markets a topic of growing interest. In December 2022, the EU adopted a regulation establishing a Market Correction Mechanism (MCM) to protect Union citizens and the economy against excessively high gas prices.

The following graphs put the trading development in TTF and EUA futures into perspective, based on indicators such as prices and volumes. Due to the recent turmoil, the main focus is on developments in the TTF gas futures market. The price dynamics are strongly driven by the current and expected physical supply of gas. Fundamental factors are macroeconomic (including geopolitical) developments and the pricing of other energy components, as well as seasonal fluctuations.

The price of gas differs across regions

21

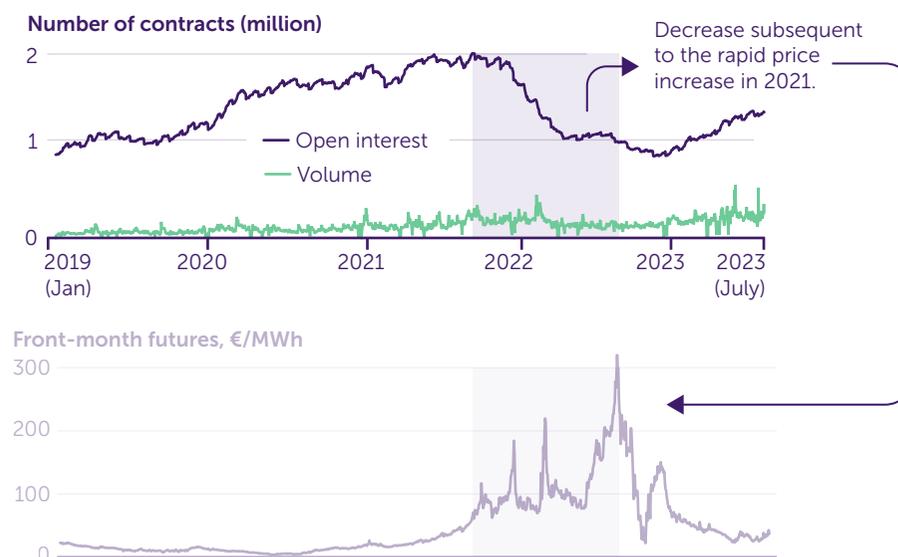


Source: ICE, Nasdaq OMX, Macrobond, AFM

This graph shows prices for front-month gas futures from different sources. Gas markets are fragmented and there is no single worldwide benchmark or price for gas. The price of TTF contracts conferring rights to natural gas already in the Dutch grid may deviate from the price of gas made available elsewhere, such as the price of contracts for the delivery of natural gas at the Henry Hub (US) or at the National Balancing Point (UK). Liquefied Natural Gas (LNG) is **traded globally**. In addition to differences in local demand, the price differences are caused by different transmission mechanisms such as storage capacity, costs of regasification (LNG) and transportation costs. If gas is particularly cheap in a certain region, LNG can be prepared for shipping to regions where gas is currently more expensive. The prices of **LNG and TTF gas are strongly correlated**. The striking difference between the price of gas in the EU and the US since late 2020 can be explained in large part by the **energy mix** in the respective regions and constrained import capacity of LNG.

Lower TTF futures trading activity during the price peak

22

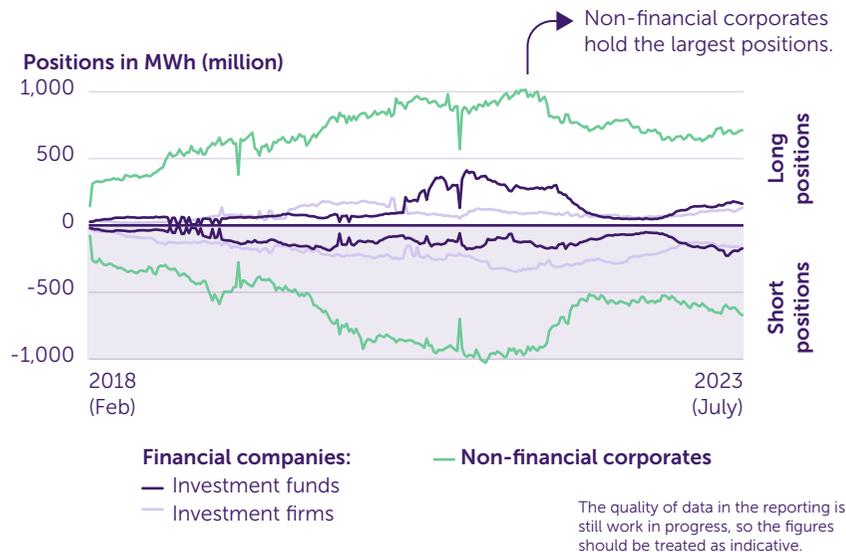


Source: ICE, Macrobond, AFM

This graph shows the development of total trade in TTF gas futures, as well as the reference price that is also displayed in the previous chart. **Traded volumes and open interest (OI) decreased** after the rapid price increase in late 2021. The lower trading activity in terms of the number of contracts partly reflects lower appetite to trade in these instruments on the back of increasing uncertainty but is also a consequence of the price effect on traded amounts. With the gradual decrease in price and easing pressure on capital charges through margins, **volumes and OI have increased steadily throughout 2023**. Open interest keeps track of every open position in a particular contract, rather than tracking the total volume traded in it, which may also include netting or closing positions. Open interest provides a picture of a **contract's liquidity and interest**, suggesting that money flows into the market are increasing. Open interest in TTF gas futures is currently five times higher than traded volume.

Non-financials account for most of the TTF positions

23

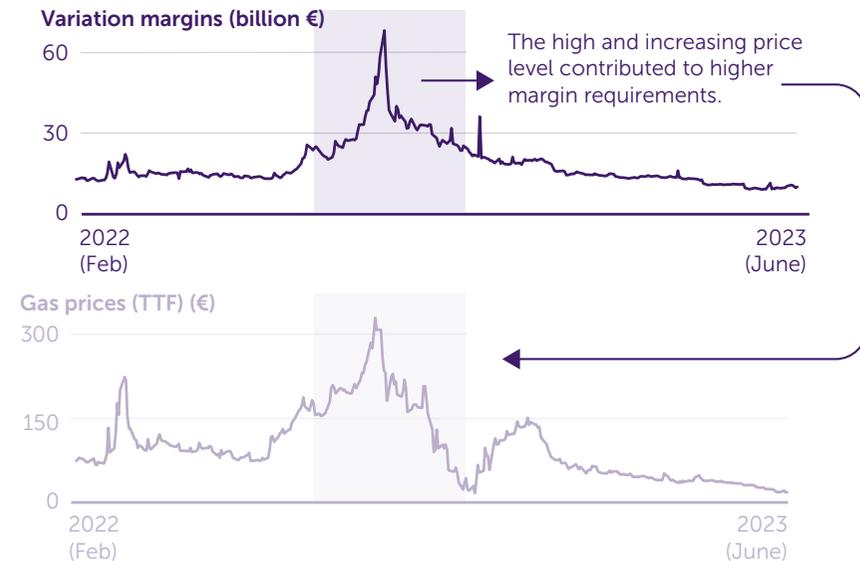


Source: ESMA weekly position reporting, AFM

This graph shows the development of outstanding short and long positions for non-financial corporates and financial companies (broken down by type) in the TTF gas market. The TTF gas market has matured since the **introduction of MiFID II**, with a growing number of participants. **Non-financial corporates** (such as energy providers and industry) hold the largest positions, using the futures market for hedging purposes. As of August 2023, 580 parties held 712 million lots in long positions and 670 million lots in short positions on the TTF gas trading platform. With regard to financial companies, we distinguish between investment firms (such as banks) and investment funds (such as collective investment schemes). Investment firms, often serving a market-making function, tend to hold short positions to a greater extent. Investment firms, seeking exposure to gas derivatives as an asset, usually take on **long positions**. During the price peak in 2022, the latter category significantly reduced its exposure in the market.

Lower margin requirements on the back of lower prices

24

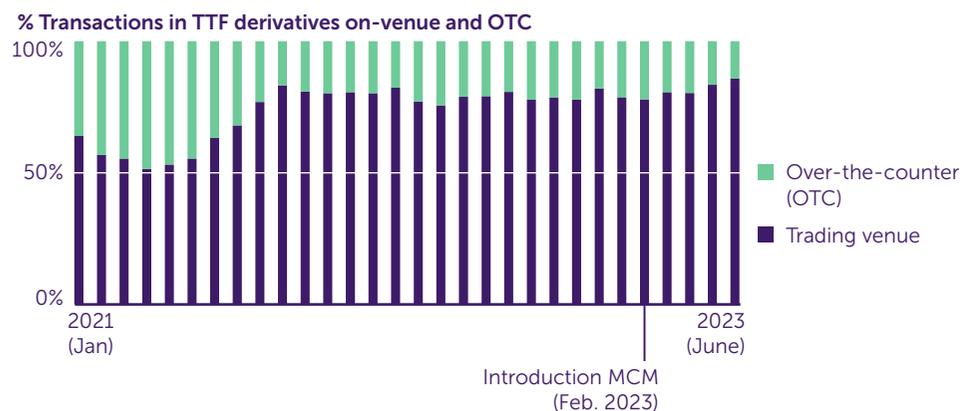


Source: AFM EMIR Reporting

This graph shows the development of margin requirements for centrally cleared TTF futures, represented as the volume of variation margin reported by domestic operators through EMIR. The sharp spike in TTF prices in 2022 implied a corresponding sharp increase in margin requirements for market participants. **Periods of high price levels (and elevated volatility)** contribute to higher margin requirements for entities trading in commodities. With elevated market uncertainty and gas prices trading higher, both CCPs and clearing members requested significantly higher initial margins. Although these margin requirements serve an important risk mitigation function, margin calls can lead to substantial liquidity problems. This was also the case for many energy firms during the price peak episode, when they were suddenly faced with unusually high margin requirements. For this reason, **temporary emergency liquidity lines** were established, although these measures could become permanent at a later stage.

On-venue trading has remained stable

25

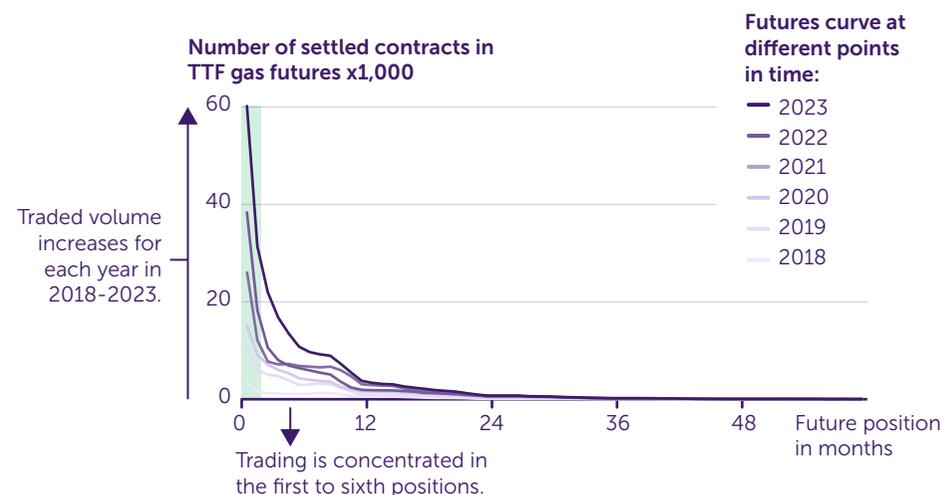


Source: ICIS, MiFIR reporting, AFM

This graph shows the ratio of OTC to on-venue transactions for traded TTF gas futures. Recent episodes of high price volatility and increasing margins have not had a structural impact on the choice of trading venue. Roughly 80% of all TTF gas futures are **traded on ICE Endex** and this ratio of on-venue trade to OTC has even increased somewhat recently. Regulation has contributed to more transparent platform trading and a shift away from OTC. Trading on a platform offers the advantage of **lower counterparty risk and more liquidity**. The costs of trading on a platform, however, are generally higher than for bilateral trade. Higher collateral requirements play an important role in entities' decisions on where to trade (and where to clear these trades). Increasing volatility and subsequent higher margin requirements could potentially trigger a shift from on-venue to more OTC trading, but that has so far not materialised. In response to the excessive price increase in 2022, the **MCM was introduced in February 2023**.

Most trading is in short-term TTF futures

26

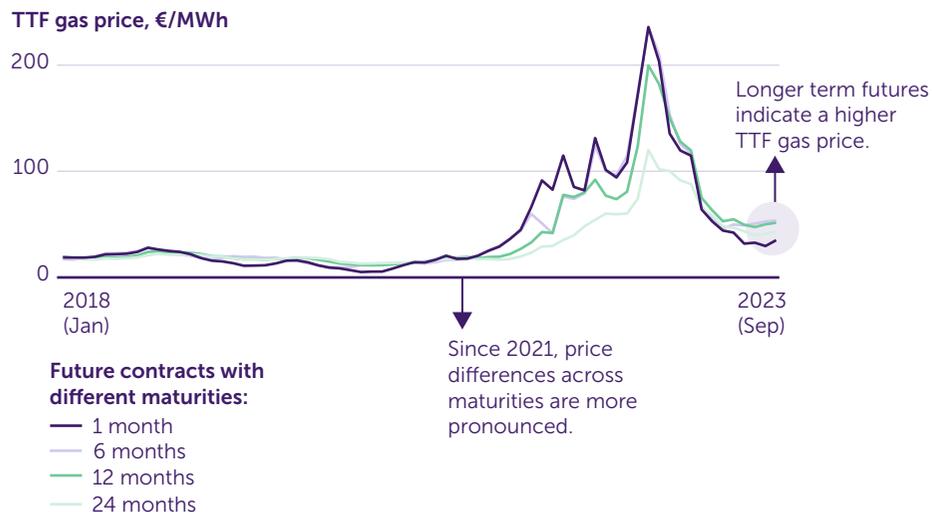


Source: ICE, Macrobond, AFM

This graph shows the distribution of traded volume in TTF gas futures across different maturities. It depicts the number of settled contracts per day for each maturity, with each line representing a different point in time. This breakdown shows that traded **volumes have increased structurally** in each year between 2018 and 2023 across all maturities. It also illustrates that most of the trading takes place at the short end of the futures curve. The trading is strongly **concentrated in the front-month position**, with the number of contracts decreasing rapidly thereafter. In maturities around one year (12th position), the traded volume is small, and for maturities beyond two years (24th position) it is very limited. With regard to open interest (not shown in the chart), there is a similar pattern across the maturity spectrum. Future contracts up to six years ahead are available, but the marginal trading activity further out on the futures curve suggests the use of longer-term futures to market participants is still limited.

Signs of an increasing TTF price going forward

27

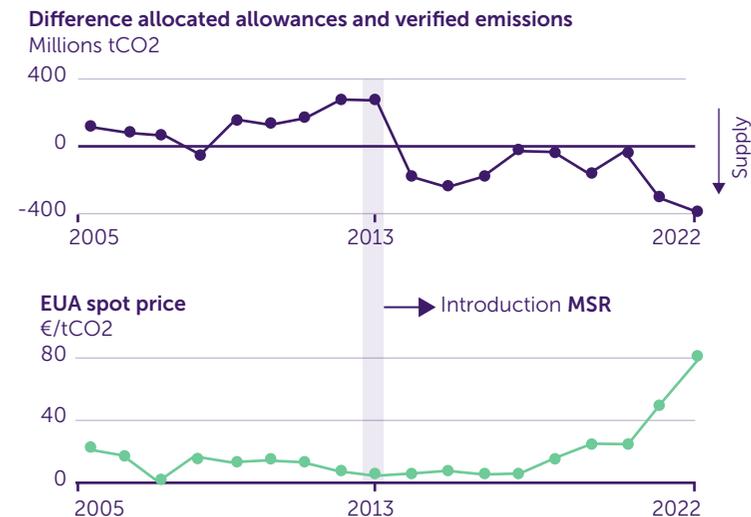


Source: ICE, Macrobond, AFM

This graph shows the evolution in the price of TTF gas at four different maturities, ranging from one month to two years ahead. The current pricing of TTF futures reflects a **higher price of gas in the period ahead**. As shown in the previous graph, this is also the range where the bulk of trade takes place. The term structure of the futures curve fluctuates due to market conditions, with the longer maturities tending to be more stable over time. Since the beginning of 2021, price differences across different maturities have been more pronounced. Fundamental factors at present may influence the pricing also at longer horizons, but it is conceivable that the higher market uncertainty has forced expectations for the longer term to shift upwards. The current term structure is hump-shaped, reflecting a price increase from the current spot price of EUR 35/MWh to more than EUR 50/MWh over a 6-12-month horizon. At the 24-month horizon **the price drops back again but remains higher than today's level**.

Lower supply of emission allowances drives EUA prices

28

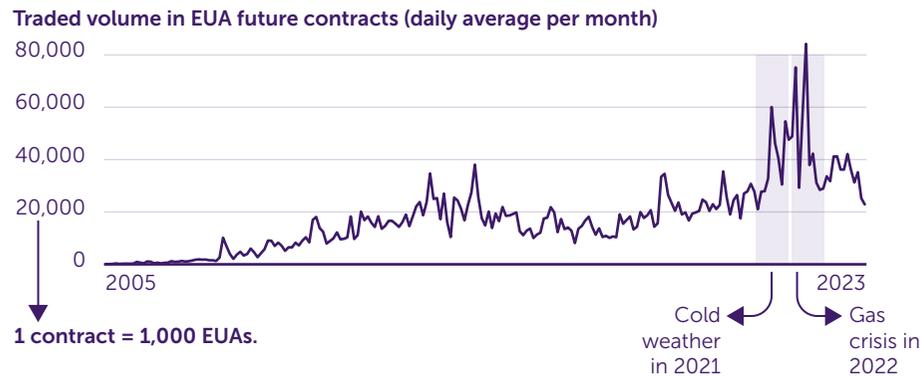


Source: EEA (2023) and EEX, AFM

This graph depicts the evolution of the market structure in EUAs alongside the spot price. **Carbon emission allowances are an important instrument in the sustainability transition in Europe**. Initially, the ETS only covered emissions from power generators and energy-intensive industries, and almost all allowances were allocated at no cost. From 2008 onwards the banking of allowances between periods was enabled and the number of allowances auctioned increased. In 2013 the **Market Stability Reserve (MSR) was introduced**, regulating the supply of allowances according to the total number in circulation. The announcement of the European Commission's "Fit for 55" package of legislative proposals reinforced the role of the EU ETS as the EU's major decarbonisation tool. The fourth phase of the ETS launched in 2021 entails a shrinking supply of EUAs over time and updated parameters for the MSR, which will further limit the amount of EUAs available in the market.

Upward trend in traded EUA futures volumes

29

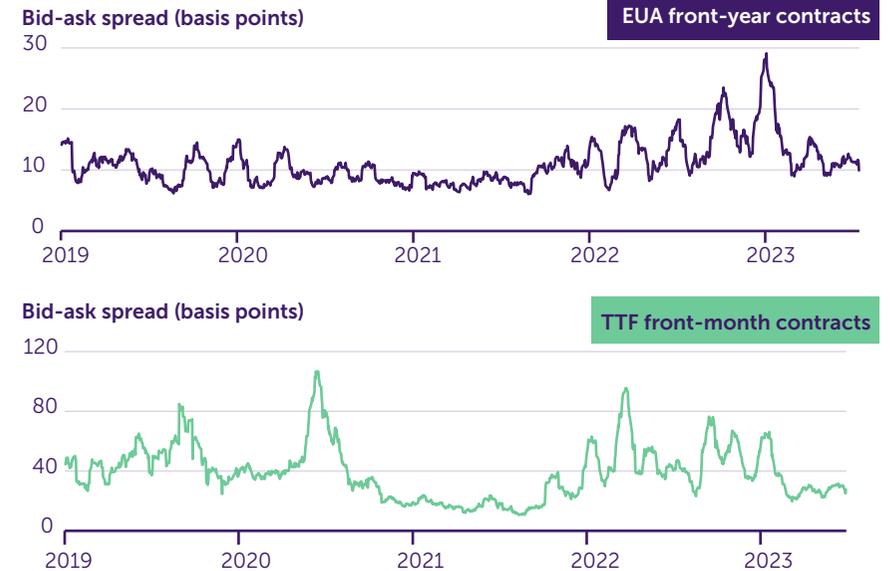


Source: ICE, Macrobond, AFM

This graph shows the evolution of the total traded volume in EUA future contracts since 2005, expressed as daily averages per month. One contract is equal to 1,000 EUAs. The traded volume has tended to increase structurally over time. Particularly cold weather in Europe at the beginning of 2021 caused energy demand to rise. In the short term, due to production rigidities, higher demand for energy translates directly into an **increase in demand for EUA certificates**. The trading activity in EUA futures reached a peak at year-end 2021, with on average some 75,000 contracts being settled on a daily basis. Traded volume remained high throughout the gas crisis in 2022. In 2023, traded volume has decreased. Open interest in EUA futures shows a similar pattern but is more substantial, currently 25 times higher than traded volume. Taking the recent price increase into account, it appears that the **market size in value terms is still increasing**.

Lower bid-ask spread in EUA futures compared to TTF

30



Source: Bloomberg, AFM

The upper graph shows the bid-ask spread in end-year EUA futures contracts, represented as a monthly moving average. The lower graph depicts the same measure for TTF front-month futures. The spreads are shown in basis points of the mid-price. Until late in 2021, the relative EUA spread was around 5 to 10 basis points. The spread increased throughout 2022 and is currently above 10 basis points. By comparison, the relative bid-ask spread in the most actively traded TTF future is about 30 basis points. We observe a similar pattern of widening spreads across the two commodities in the latest period. With the gas price rising, peaking above EUR 300/MWh in August 2022, the average TTF spread on several occasions exceeded 60 basis points. Although not entirely comparable (physical commodity versus administrative rights), **this indicates a difference in liquidity conditions between the two markets**. As a point of reference, the relative spread in blue chip equities is three basis points.

Methodology, data sources and limitations

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Scope

Capital markets are inherently complex, large and international. There are numerous indicators that could tell a story of capital markets. When compiling the State of the Capital Markets, we decided to limit the number of graphs to thirty, and, whenever possible, to base these graphs on data reported to the AFM. This allows us to focus on currently important trends and policy changes. We do not aim to provide an exhaustive overview of all relevant aspects of capital markets. We distinguish three markets – equity, fixed income and commodities – and offer a Dutch regulator’s perspective on the integration of European capital markets. Moreover, the State of the Capital Markets 2023 report focuses on trades in Dutch financial instruments aggregated for a specific period. Our position as a national competent authority enables us to provide unique insights into where and how trade activity takes place.

Data sources

Some graphs in the report use external data sources, but most are based on self-reported data from market participants. The AFM receives transaction, order and position data under the applicable regulations (MiFIR/MiFID, EMIR, SFTR). These require the reporting of transactions by Dutch entities, in Dutch instruments or on Dutch trading venues. In this case, ‘Dutch’ means that the entity is established in the Netherlands. Please note that reported transactions differ from actual transactions. For example, cleared on-venue transactions between participant A and participant B are mostly reported as follows:

- A -> ClearingMemberA
- ClearingMemberA -> CCP
- CCP -> ClearingMemberB
- ClearingMemberB -> B

Each leg is reported by both parties. This means that a transaction can be the

subject of eight reports. When one of the parties (A or B) does not have the obligation to report (e.g. non-EEA), only seven reports are received by the AFM. Uncleared, bilateral transactions are generally reported twice, once by the selling and once by the buying entity. Graphs are standardised to account for multiple reported values.

Data quality

While we take the greatest possible care when processing data, please be aware that not all data quality issues have been fully resolved. We carefully analyse data sets, omit highly improbable outliers and translate any non-euro values into euros. In general, data from trading venues is more accurate than bilateral trading data. Markets where trading is largely conducted on trading venues, such as the equity, gas and EUA markets, therefore tend to have fewer data quality issues.

Review

All graphs have been reviewed by subject matter experts. Documented longer-term trends in the graphs are consistent with the AFM’s view of market developments.

Other remarks

Because of its sensitive nature, any data based on proprietary AFM sources is not made available to external researchers.

State of the Capital Markets 2023