Analysis

The European Equity Lending Market
Exclusive Security Lending Agreements

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Natalie Kessler, Iman van Lelyveld, Ellen van der Woerd

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The European Equity Lending Market: Exclusive Security Lending Agreements

Authors:Natalie Kessler, Iman van Lelyveld and Ellen van der Woerd. With thanks to our colleagues at the DNB, and in particular Emme van den Boom, Robert Hofman and Tibert van der Loop for the exchange of views. All remaining errors are ours.

De Nederlandsche Bank n.v.
P.O. Box 98 1000 AB
Amsterdam
Internet: www.dnb.nl
Email: info@dnb.nl

Summary

- We provide a first overview of the European equity lending market using deal-level granular data reported under the Securities Financing Transactions Reporting (SFTR) with a particular focus on exclusive security lending agreements (ESLAs).
- Equity lending market participants can be broadly divided into four categories: private and corporate lenders that lend out part of their equity portfolio, broker-dealers that both borrow on their own behalf as well as on the behalf of corporate and private ultimate borrowers, and traders that borrow and lend but just for their own account.
- Both broker-dealers and traders enjoy positive bid-ask-spreads between their lending and borrowing transactions. However, broker-dealers are on average substantially more profitable than traders.
- The difference in profitability is partially driven by broker-dealers' use of ESLAs giving them exclusive access to their clients' portfolios.
- The 35.0% of clients with an ESLA experience on average both lower trading volume and lending fees, but are relatively more collateralized.

1 Introduction

Sufficient security lending supply is crucial for short sales to eliminate arbitrage opportunities, ensuring that the law of one price holds in financial markets. Consequently, market disruptions due to the lack of such supply, typically referred to as short sale constraints, have been widely studied (Beber and Pagano, 2013; Boehmer et al., 2013). The overall conclusion is that limits to short selling reduce market liquidity and slow the speed of price discovery. Nezafat et al. (2017) provide a theoretical basis to rationalize how short sale constraints result in mispricing due to lack of information sharing. Boehmer et al. (2008) take an empirical approach and examine short sales on the New York Stock Exchange (NYSE). They argue that short sellers are important contributors to realizing efficient stock prices. Finally, Foley-Fisher et al. (2019) take a more aggregate view and assess the impact of security lending on overall OTC security market functioning. They discuss that dealers might use the equity lending market to overcome temporal gaps in supply and demand. A well-functioning equity lending market is, thus, fundamental to ensure financial market efficiency.

Despite the ample evidence on adverse consequences, the market structure literature analyzing the micro-foundation of short sale constraints remains scarce. With several different types of market participants engaging in chains of lending transaction trade, the lending market itself might not be frictionless. In the equity lending market, private and corporate portfolio holders lend out part of their equity holdings to broker-dealers in so called lending transactions. Here, search and bargaining frictions might substantially impact security supply to broker-dealers. Broker-dealers in turn lend out 69.4% of these stocks to ultimate borrowers, while keeping the remainder on their own balance sheet. High inventory costs from balance sheet holdings can drive up lending fees for borrowing certain securities, thereby rendering them unattractive to ultimate borrowers (Colliard et al., 2021). Finally, there exists a small group of less well-connected traders that engage in both borrowing and lending, but rarely simply intermediate. If limited search or bargaining frictions drive up transactions costs of inter-dealer trading (Duffie et al., 2005; Hau et al., 2021; Iercosan and Jiron, 2017), the market may experience reduced liquidity that trickles down (Foley-Fisher et al., 2019). While some borrowed stock is used to influence shareholder votes (Aggarwal et al., 2015), security lending is predominantly used for short sales (Asquith et al., 2005). As such, security lending frictions adversely impact price discovery and eliminating arbitrage opportunities for overvalued firms.

Historically, a lack of available data challenged our ability to assess the functioning of the equity lending market. To reduce opacity, the European Securities and Markets Authority (ESMA) started collecting all equity lending transactions with at least one trading party operating in the European Union (EU) as part of the Securities Financing Transactions Reporting (SFTR) data. In this analysis we utilize the SFTR data to study the EU-based equity lending market and provide a novel and unique market overview. We provide insights on who trades with whom, for long how, and under which conditions.

We show that 35.0% of all initial lenders and 4.5% of all ultimate borrowers purposely limit their interactions to a single broker-dealer by entering into a so called Exclusive Security Lending Agreement (ESLA). The average lending transaction via ESLAs exhibits both a lower volume (quantity times prices) and higher lending fees. However, the lending fee distribution under ESLAs are right-skewed with a median fee just above zero. ESLAs, further, seem to be predominantly covering euro denominated stocks, while dollar denominated stocks are more frequently traded outside ESLAs. Finally, we take a closer look at collateral. While the text book definition for a security lending typically describes a collateralized transaction, we surprisingly find that 34.1% of transactions and 7.8% of total trading volume is not secured with collateral and is thus unsecured. Here, a quarter of all collateralized transactions are covered by ESLAs, while almost none of the unsecured transactions are part of an ESLA. Summarizing, it seems that ESLA-covered lending is typically smaller, less profitable but more collateralized. We provide a detailed analysis of the drivers behind these differences in a complementary paper (Kessler et al., 2023).

It is mostly broker-dealers engaging in ESLAs, and thus, benefiting from such small fees at the lower end of the distribution. Additionally, broker-dealers are better connected than traders (on average close to 6000 counterparties versus 6). Not surprisingly, we find broker-dealers' trading spread — the difference between the borrowing and the lending fee — to exceed that of the smaller traders. This finding holds regardless of whether transactions are collateralized and which type of collateral is used. And, thus, both the number and type of trading connections seem to matter substantially for profitability.

Our analysis is structured as follows. In Section 2 we describe the SFTR data in more detail and explain the cleaning steps and assumptions made. In Section 3 we first provide a general market overview of transaction characteristics for transactions with and without ESLAs. We then give a description of the type of trading parties in this market. Finally, we analyze how this type of lending transaction is collateralized and the lending fees that are paid in exchange for the lending of the securities. We conclude in Section 4.

2 The SFTR data

For the analysis we use the newly available SFTR data that contains daily updates on every security transaction with at least one trading party operating in the European Union (EU) via a branch, subsidiary or parent company. The SFTR data consists of four subsets containing repurchase transactions (Repo), securities and commodities lending, buy-and-sell back transactions, and, finally, margin lending.

We consider only equity lending transactions, which are part off the securities and commodities lending subset. For each transaction our dataset contains around 100 contract fields covering information on the trading parties' identifiers, duration, properties of the lend-out security, loan value, lending conditions (such as lending fee and the presence of an ESLA), collateral and much more. A full overview of all reported information can be found in the SFTR Reporting Guidelines published by the ESMA (2022). The dataset has been enriched with ca. 800 additional fields from the European Central Bank's internal databases containing additional information on the counterparties and the underlying equity.

The database operates on a daily updating scheme, where both the daily modifications (flow) and end-of-day status (stock) are reported for each transaction by each EU counterparty from entry until maturity. Thus, open transactions between two EU counterparties enter twice each business day. Each leg can be traced by an Unique Transaction Identifier (UTI) over time. If CCPs are active to centrally clear the contract, novation implies four entries per transaction per day. However, we find that less than 1% of all transactions are cleared by a CCP and for simplicity exclude these from our analysis for now.

At the time of analysis, we had data available from mid 2020 until January 15th, 2022. However, we restrict our sample to UTIs that were both opened and closed in 2021 giving an overview of the full year in this market report. Our initial dataset, thus, contains a little over 20.7 million UTIs. Here, at this stage the datasets include multiple reports of the same transaction under different UTIs if both trading parties are registered in the EU and are thus both obligated to report.

We perform an extensive set of cleaning steps on the 2021 sample to exclude obvious double and misreporting. Where both contract parties report identical information for all variables, we drop one of the two records and assign a Real Unique Transaction Identifiers (RUTI). For all remaining UTIs

— where in most cases one of the contract parties has submitted one or more empty fields — we assign a quality score based on the number of mandatory, yet empty contract fields. We drop legs with too poor quality. If both legs of a transaction remain in the data, we subsequently keep the better quality leg. For all transactions, where no second leg could be identified in the data, we assume the counterparty to be registered in a non-reporting country outside the EU and EEA. A detailed explanation of the cleaning steps and removal of duplicates can be found in Appendix A. Ultimately, we end up with 15.8 million RUTIs. For every RUTI, we will in the subsequent sections focus primarily on describing the conditions as agreed upon on the day of execution of the transaction with the notable exception of maturity. Tracking variable contract fields, such as market value and collateral value, over time is challenging for such a large number of data points and provides little additional insights on initial lending conditions at contract entry.

3 Market Overview

This market overview consists of three parts: first, we provide some general market statistics on the RUTI level to gain a better understanding of the European securities lending market. In the second part, we aggregate the data on counterparty level and focus on trading party characteristics. We conclude with an overview of collateral used and lending fees paid in exchange for the equity lending. In all three parts, we will have a specific focus on the difference between transactions with and without an ESLA.

3.1 Transaction level overview

As mentioned above, a total of 15.8 million (really) unique lending transactions opened and matured in the European non-cleared equity lending market in 2021, totalling a total loan value of 4.2 trillion euro. Of these RUTIs, 13.9% were entered under an active ESLA with a total loan value of 280.8 billion euro, or 6.6% of the total loan value. Table 1 shows the average loan value, quantity and unit price for transactions with and without ESLA.

Table 1 Transactions statistics by ESLA status

ESLA	% of transactions	avg loan value (EUR thousands)	avg unit price (EUR)	avg quantity
With	13.89	127.838	42.43	9080.11
Without	86.11	291.253	46.77	19742.78

We find that the average exclusive transaction has a loan value of around 127.8 thousand euro — less than half the value of an average non-exclusive trade. This difference is mainly due to the quantity of borrowed securities per contract and not the difference in share value, as the average unit price per stock is similar.

Table 2 provides an overview of the location of the trading parties and the corresponding transaction volume. Here, we distinguish between euro area counterparties (EA), counterparties in the non-EA EU countries and EFTA countries (EU or EFTA) and the rest of the world (ROW). We find that, although the majority of transactions have both trading parties in the EA, transactions with the ROW counterparties have a significantly higher loan value. This could be explained by the fact that small trading parties mainly trade within their local area, while for example large broker-dealers trade worldwide.

Table 2 Trading parties' location

location	% of transactions	total loan value (bil EUR)
EA - EA	69.96	721.23
EA - EU or EFTA	4.83	444.91
EA - ROW	10.46	1725.28
EU or EFTA - EU or EFTA	0.77	55.80
EU or EFTA - ROW	13.98	1300.39

A natural next step is to analyze the main currencies in which the RUTI's underlying stock is denominated. Table 3 and Figure 1 display the absolute and relative total lending volume by currency, respectively. We find that, overall, the majority of borrowed stock (measured in loan value) is in US dollars (USD). This reflects that the fact that most high value transactions are with counterparties outside the EU. For transactions with an ESLA, however, the most common currency is the euro (EUR). This is consistent with the home-bias hypothesis, where smaller market participants predominantly trade in local assets (Hau and Rey (2008)). As we will show in the next sections, it is also those smaller participants that typically enter into ESLAs. Besides euro and US dollars, British pounds (GBP), Japanese Yen (JPY) and Swiss Francs (CHF) are the currencies in which the underlying equity is denominated.

Table 3 Absolute loan value by currency (bil EUR)

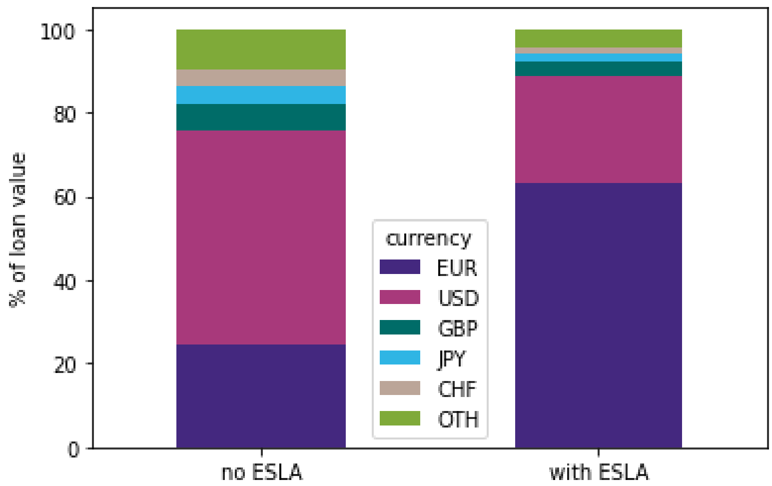
currency	without ESLA	with ESLA
USD	2036.79	72.11
EUR	965.27	176.71
GBP	246.01	9.38
JPY	181.90	5.65
CHF	155.54	4.77
Other	381.29	12.19

We conclude the RUTI level analysis by zooming in on (realized) maturities. The vast majority of security lending contracts either specify a fixed maturity of one day or are labeled evergreens. The one day contracts (overnight lending) are often rolled over, i.e. renewed the next business day without returning the security first. However, these renewals are often subject to either a collateral or lending fee update. To categorize what exactly constitutes a roll-over versus a new contract goes beyond the scope of this descriptive analysis and is left for future research. We, therefore, abstract from any matching attempts and simply report each over-night transaction as a separate observation.

In the case of evergreens, sometimes also called open-term agreements, no future return date is specified at the contract entry. Instead, the loan remains active until either counterparty wishes to end the agreement: Either the lender requests the return of the security or the borrower simply returns it. In these cases, we calculate the realized maturity as the number of days between the execution of the contract and the final transaction update in the data.

The majority of transactions have a maturity of less than a month, more specifically 70.0% of transactions are only overnight or over the weekend. The distribution of maturities is shown in Figure 2. As we only analyze transactions which are entered into and which also matured in 2021 we have a maximum maturity of 12 months and by construction a slight bias towards lower maturities. For a more extensive analysis of the impact of this choice we refer to Appendix B.

Figure 1 Relative value by currency



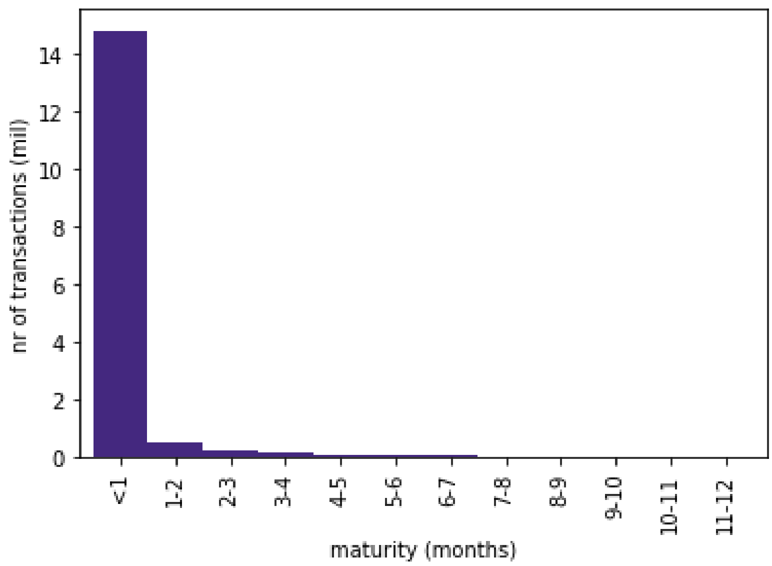


Figure 2 Distribution of the maturity of transactions.

3.2 Trading party characteristics

In a next step, we aggregate the RUTIs by counterparty-pair such that we obtain a single connection (edge) between two counterparties whenever they have at least one executed and matured trade in 2021. Subsequently, analyzing the directionality of lending transactions for each counterparty, we identify five different types of trading parties: lenders, borrowers, private clients, broker-dealers and traders. Lenders and borrowers are identified by the fact that at least 99.0% of their loan value is lending or borrowing respectively. We choose these strict cutoffs as the data shows a clear distinction between trading parties that fully lend or borrow and parties that do both (see Appendix C). Private clients are trading parties that are identified by private client id's instead of LEI codes by the reporting counterparty. Since we have no way of identifying who they are and whether they also have trades with other counterparties we label them separately. Finally, broker-dealers and traders are parties which both lend and borrow. Here, we define broker-dealers as those that have more than and traders as those that have less than 100 different counterparties respectively.

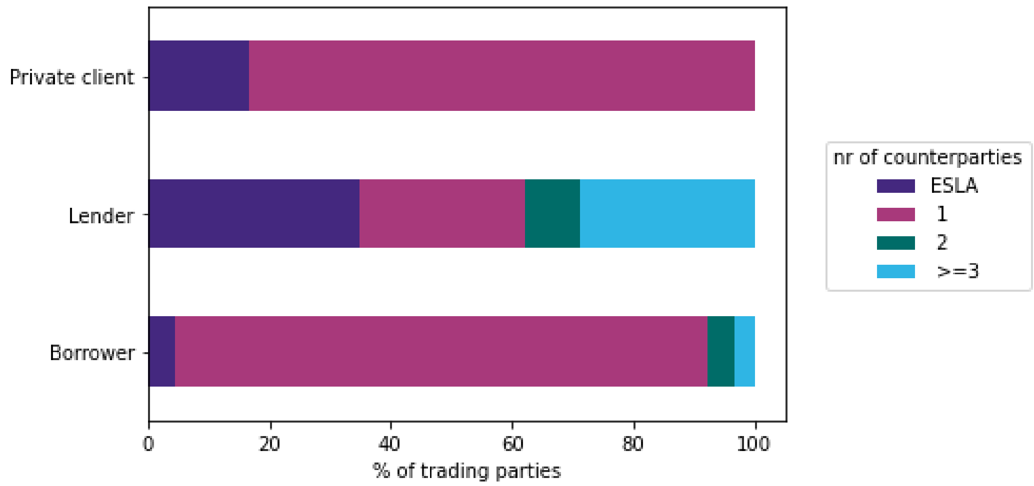
Table 4 Trading party characteristics

Type	Nr of parties	Avg total loan value (mil eur)	Avg transaction value (mil eur)	Avg nr transactions	Avg nr of counterparties
Borrower	469	2106.29	2.62	3305.13	1.54
Broker-Dealer	39	124570.89	1.23	423022.13	5859.36
Lender	6512	239.83	8.86	293.11	3.27
Private client	208214	0.54	0.01	51.73	1
Trader	442	2202.67	1.55	1893.40	6.07

RUTI characteristics aggregated by the type of trading party are shown in Table 4 above. We find that the majority of trading parties are small private clients. On average they have 51.7 transactions with their counterparty per year with an average transaction value of EUR 10,000. We also see more than ten times more lenders than borrowers. Lenders lend to an average of 3.3 counterparties, while borrowers only have 1.5 counterparties. In contrast borrowers are in general larger counterparties which borrow around 3300 contracts per year of an average loan value of 2.6 million euro. Lenders only lend around 300 contracts per year with an average value of 8.9 million euro.

In Figure 3, we elaborate on the frequency with which lenders, borrowers and private clients connect with one, two or more counterparties in more detail. We find that around one third of the lenders have an ESLA and therefore only one counterparty. Another 27.1% of lenders has a single counterparty without ESLA, while the rest have two or more. In contrast most borrowers only have a single counterparty, but almost never with an ESLA agreement. Of all private clients only 16.7% have an ESLA.

Figure 3 Relative share of trading parties per type



We identify 39 broker dealers in the data set. These are very large trading parties with on average 5859.4 counterparties and a large number of transactions all through the year. Their average volume per transaction is in between that of lenders, borrowers and private clients, indicating that they indeed trade with all types of counterparties. The RUTI characteristics of traders are closer to those of lenders and borrowers than of broker-dealers. In Table 5 we show the ratio of lending and borrowing for broker-dealers and traders. Broker-dealers borrow more than they lend, leading us to conclude that they use part of the borrowed stocks for their own short selling, hence the name broker-dealers to reflect their dual capacity (Röell (1990)). In contrast, traders lend more than they borrow, indicating that they have their own portfolio, which they lend out.

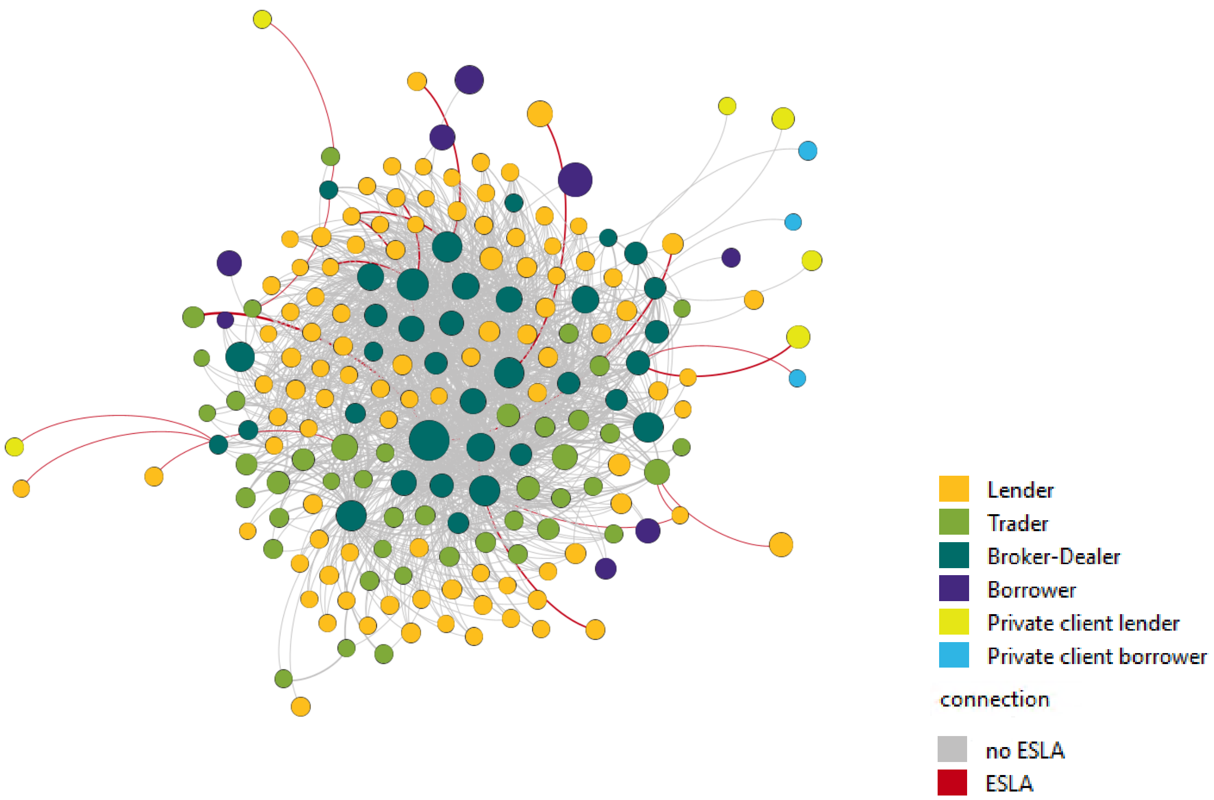
We find that the network in the equity lending market exhibits a core-periphery structure as shown in Figure 4. For confidentially reasons we have aggregated all borrowers, lenders and private clients with the same single counterparty as one trading party. In the core, we find highly interconnected broker-dealers and traders. However, most broker-dealers have their own lenders, borrowers and clients. Further, the pure borrowers (in blue) only deal with a fraction of the broker-dealers, partially facilitating trade amongst the broker-dealers. There are also multiple lenders and traders which deal

Table 5 Lending and Borrowing volumes

Type	total lending value (eur bil)	total borrowing value (eur bil)	ratio lending/borrowing
Broker-Dealer	1990.40	2867.86	0.69
Trader	590.09	383.49	1.54

with on average three other counterparties, interconnecting the network structure even more. The red connections in Figure 4 also show that most ESLA's exist between lenders and broker-dealers, as expected.

Figure 4 Network plot of the equity lending market.



3.3 Lending fees and collateral

The text-book definition of security lending describes a collateralized transaction, where the security owner lends it to another investor or firm, who provides either other securities or cash as collateral in return. In the data, we find that 33.3% of all transactions (85.9% in total volume) are collateralized with a basket of securities either on a loan or portfolio level (see Table 6). For these types of transaction, the lender typically receives a lending fee. Lending fees are traditionally denoted as an annualized percentage of the loan value. A 1% lending fee thus implies that, should the loan be outstanding for an entire year, the borrowers pays 1% of the loan value.

Another 32.7% of equity lending transactions (6.2% of total volume) are collateralized which cash. The lender can typically re-use the cash collateral for profitable investments potentially realizing returns above and beyond the typical lending fee percentages. This triggers the lender to pay a rebate rate to the borrower. Therefore, a net rebate rate (rebate rate minus lending fee) is reported instead in the data. Similar to the lending fee, the net rebate rate is denoted as an annual percentage payment on the loan value but may take on negative values.

Finally, and perhaps most surprising, we find that the remaining 34.1% of transactions (7.8% trading volume) are unsecured. In other words, the lender does not receive any kind of collateral for the security loan. In this case, similar to the security collateral case, a lending fee as an annualized percentage of loan value is specified. Note that this is stark contrast with the interbank money market where the unsecured market is still to recover after the 2008 crisis.

Table 6 Transaction characteristics per collateral type

collateral	ESLA	nr transactions	total loan value (bil eur)	avg. loan value (eur)	avg. quantity
basket	without	4186148	3385.43	808722	45064
basket	with	1076082	265.13	246381	20356
cash	without	4052657	249.63	61597	7734
cash	with	1115701	15.16	13589	3101
none	without	5380961	331.73	61649	6440
none	with	4783	0.52	108058	9241

Next, we analyze the lending fee for transactions without collateral or have a security basket collateral. We find that for transactions with a collateral basket the lending fee is always reported in the data. However, this is not the case for transactions without collateral. Therefore we are only able to analyze the share of transactions that have reported lending fee.[1] For the overview, we remove fees above the largest 99th percentile of the lending fee distribution, as these outliers greatly influence our results.

Table 7 Fees for lenders & borrowers

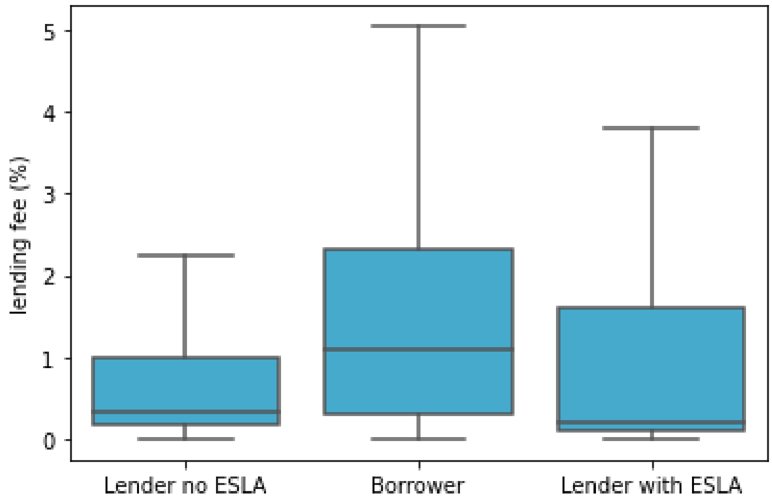
	avg. lending fee %
Borrower	1.58
Lender no ESLA	1.02
Lender with ESLA	1.54

On the remaining transactions, we calculate the average lending fee as the average across all trading parties of the average lending fee per trading party. We do this as we want to gain insight in the average lending fee that different trading parties pay. If we would take the simple average over all

[1] Note that previous to January 2022 it was not obligatory to report the lending fee. Reporting requirements have changed since and it is now compulsory to report the lending fee in case of no collateral.

trades we would find the result heavily skewed towards the lending fee offered by the most active trading parties. As the value of the lending fee heavily depends on the type of trading party, we split the results by party type. For borrowers and lender the results are shown in Table 7, and for broker-dealers and traders in Table 8. We exclude private clients for this part, as we cannot know for certain if they enter multiple times in the data and thus computing the average per trading party might measure their true average fee.

Figure 5 Fees for lenders & borrowers



We find that borrowers on average pay more than lenders receive. Further, we find that lenders with an ESLA receive on average a higher lending fee than lenders without ESLA. However, this result is partially driven by the higher variance in party-level average lending fees. As the boxplots in Figure 5 highlight, there is a higher dispersion in fees of lenders with ESLAs relative to those lenders without. But the ESLA holding lenders' average fees are also more skewed towards zero. This means, that the ESLA holding lenders actually have the lowest median in average fees, as indicated by the black lines.

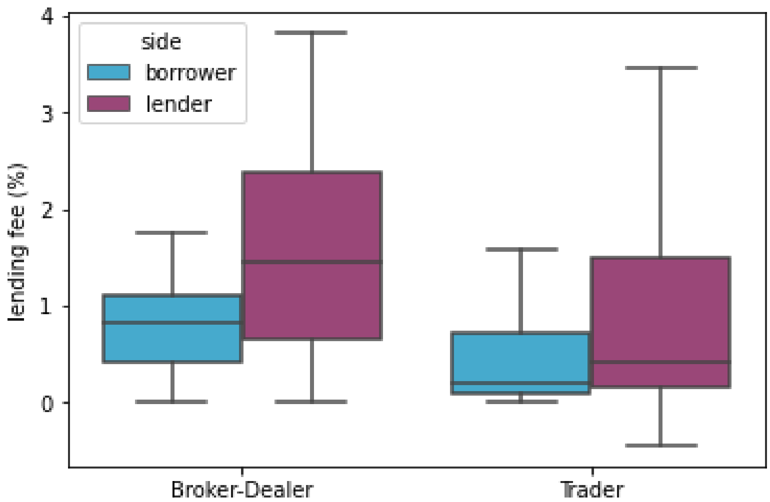
Broker-dealers and traders, by definition, take on both the role of lenders and borrowers of securities. They on average make a profit between their incoming transactions (borrowing) and their outgoing transactions (lending). As Table 8 highlights, the average broker-dealer makes a profit of 1.1 percentage points. The profit of average traders is smaller with only a 0.3 percentage point difference between between lending and borrowing. This reflects the lower connectivity and trading volumes of traders. The broker-dealers are the more sophisticated market-makers and, thus, earn higher spreads.

Table 8 Lending fee for broker-dealers and traders

Type	avg. borrowing fee (%)	avg. lending fee (%)
Broker-Dealer	0.85	1.92
Trader	0.98	1.25

As the boxplots in Figure 6 show, both the dispersion and skewness toward zero are lower for the per-party average lending of broker-dealers and traders. Hence, the mean and median of the average fees are closer together than those of lenders and borrowers.

Figure 6 Lending fee for broker-dealers and traders



We perform a similar analysis for the net rebate rate in case of cash collateral. The rebate rate can either be a fixed interest rate or can be based on a floating rate. We find that 99.5% of the cash collateralized transactions have a fixed rebate rate. However in terms of loan value only 62.8% of transactions have a fixed rate. The other 37.2% of loans have a floating rebate rate. This indicates that larger transactions most often have a floating rate.

We start by describing transactions with fixed rebate rates. Here, a net rebate is reported directly. It is computed as the rebate rate paid from the lender to the borrower in exchange for the cash collateral minus the lending fee paid from the borrower to the lender. This implies for one that a lower rebate rate is more favorable for the lender and, furthermore, that the reported net rate may be negative.

Table 9 Fixed rebate rates by trading party

Type	avg. borrowing fee (%)	avg. lending fee (%)
Broker-Dealer	-0.55	-2.47
Trader	4.88	3.06
Borrower	0.70	-
Lender no ESLA	-	0.13
Lender with ESLA	-	0.01

Table 9 shows the fixed rebate rate per trading party. As for the lending fee, we excluded outliers above and below the 99th percentile of the rate distribution.[2] Similar as for the lending fees, we find

[2]Due to the small number of negative rebate rates, we excluded the lowest 1st percentile based on negative

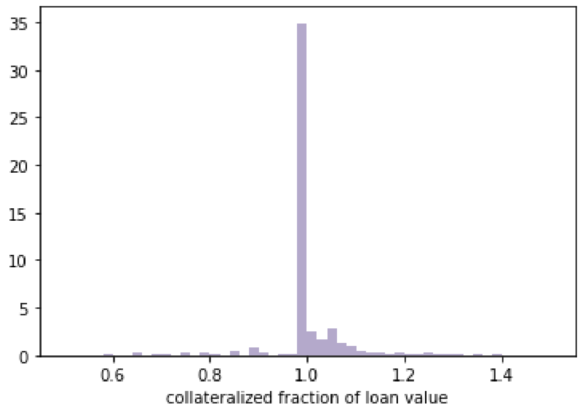
that is it advantageous for lenders to have an ESLA as they pay almost zero rebate rate in exchange for the cash collateral. Lenders without ESLA pay an average rate of 0.1%. For borrowers we find a high rebate rate of 0.7%. At first sight, it seems puzzling that borrowers receive more than lenders pay, especially because both broker-dealers and traders again make a profit between incoming and outgoing transactions. Investigating further, we find that in case of cash collateral, pure borrowers mainly interact directly with lenders, leading to the higher rate. While broker-dealers and traders cash-collateralize their borrowing (from lenders), they rarely ever seem to request cash collateral from outright borrowers.

Table 10 Floating rebate rates

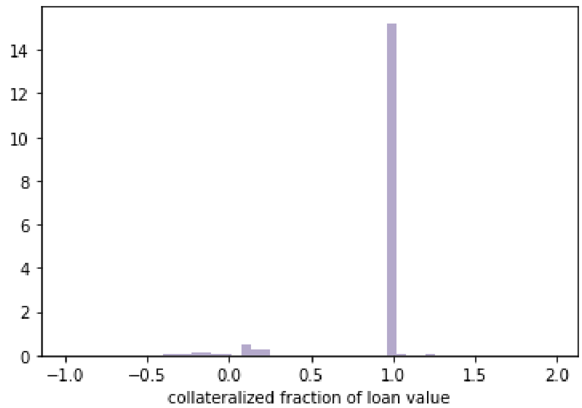
Rebate reference rate	% of transactions	loan value (bil eur)	avg. spread (bps)
EONIA	53.09	27.81	-2.00
OBFR	34.66	52.47	19.70
ESTR	1.97	1.69	-15.53
Other	10.27	16.00	26.40

In the case of a floating reference rate, a spread that is added to a pre-determined reference rate is reported instead. Table 10 shows that that the most common used floating rates are Eonia, OBFR (Overnight Bank Funding Rate) and ESTR. The OBFR rate has the highest loan value, which agrees with our findings that trades with counterparties outside the EU often have a higher value. As expected, 90.3% of the underlying stock for the Eonia is denominated in EUR, while for OBFR 97.8% the underlying stock is denominated in USD. We also find that the European rates Eonia en ESTR often have an added negative spread, while the spread for the FedFunds rate is positive. This implies that lenders' on average profit more from transactions with Eonia as a reference rate.

Figure 7 Cash collateralized fraction of loan value



(a) Nominal amount (no haircut)



(b) Haircut adjusted amount

rates only.

Finally, we look at the rate of collateralization via cash both for floating and fixed rebate rates combined. Figure 7 shows the distribution of the collateral value compared to the loan value with and without adjustment of the specified haircut. From the spike at 1 in Sub-figure 7(a), we can see that the largest share of trades have a nominal cash collateral equal to the loan value. However, there are also quite a few trades that are over-collateralized. Applying the reported haircuts to the cash collateral, we can see in Sub-figure 7(b) that the adjusted values now also perfectly match the loan values. This leaves a small number of trades that are substantially collateralized. Given their proximity to zero, we assume that the haircut were misreported not as the % of reduction, but directly as the ratio of adjusted-to-nominal value (100%-haircut).

4 Conclusion

In this analysis we give a unique market overview of the European equity securities lending market, providing both transaction level and counterparty level insights. We highlight in particular the difference between transactions covered and not covered by Exclusive Securities Lending Agreements (ESLAs), but also which market participants typically enter into such ESLAs.

We find a highly interconnected core market, which consist of 39 broker-dealers that all trade with each other, and a large number of traders and lenders with multiple counterparties. At the periphery, we identify a group of lenders, borrowers and private clients that solely lend and borrow with a single broker-dealer. Here, pure lenders are more common than pure borrowers. However, pure borrowers trade relatively larger volumes.

We find that among those parties with only a single connected broker-dealer, ESLAs are predominantly entered by lenders followed by private clients, while borrowers rarely enter into an ESLA. Zooming in on lending terms under ESLAs, we find that they often cover smaller transactions that on average yield a higher lending fee (net rebate rate). Yet, the median fee (net rebate rate) of ESLAs is actually close to zero indicating a high skewness. In an accompanying academic paper we provide a theory why lenders enter into ESLAs, even if the majority seem to benefit little as they make close to zero profits (Kessler et al., 2023).

Focusing on more aggregate patterns, we see that broker-dealers and traders consistently enjoy a positive spread between their lending and borrowing fee. Additionally, we show that most transactions are denoted in euro and are conducted between counterparties within the EU. However, the largest transactions are with counterparties outside the EU, leading to a majority of the loans by value to be denominated in US dollar. Further, a third of the lending transactions are collateralized by either cash or a basket of securities respectively, while a third of transactions is un-collaterlized. Measured by loan value, however, most of the market is indeed collaterlized. Here, the large volume transactions are mainly collateralized on portfolio level with a basket.

A key challenge in providing the above mentioned insights is the sheer size of the database, both due to the (double) reporting of daily status and transaction reports and the over 900 contract fields per entry. This makes it particularly challenging to distinguish between misreportings, data glitches and interesting patterns worthwhile exploring. With that in mind, we have put significant effort in developing our cleaning codes in a way that it can be reused and extended to the other subsets of the SFTR data. For those with access to the data, please do not hesitate to get in touch with us. We would be happy to share it via the appropriate infrastructure.

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Appendix A General Data Cleaning

All data selection and cleaning steps and the corresponding number of kept trades are summarized in Table A.11. As a first step, we only keep non-cleared transactions as the cleared market is only a very small subset of the equity lending market and possibly subject to different conditions.

Next, we only keep trades with a realized maturity exceeding a single day. Realized maturities are calculated as the difference between execution date, or first date of database entry if missing, and the business date of final entry into the database. We remove the single day trades, since these are often misreported trades that were never executed.

For longer maturities, we keep those positions that were both opened and closed in 2021.Before January, 2021 dataset was still in the testing phase and in January, 2022 new reporting standards were introduced. For a more in depth explanation of the definition of realized maturity and the consequences of removing certain maturities see Appendix B.

We further eliminate intragroup transactions, where both trading parties have the same ultimate parent company. We also perform a few data quality checks and remove transactions with missing euro values, negative and inconsistent loan-value and negative quantities.

Table A.11 Cleaning steps

Cleaning steps	Number of trades kept	% Off trades kept (compared to previous step)	% Off trades kept (compared to total)
Initial Equity subset	34816447	100%	100%
Removal cleared trades	34717429	100%	100%
Remove single day trades	32085757	92%	92%
Entered and matured in 2021	20704111	65%	59%
Single report per uti, trading parties	20572719	99%	59%
Remove trades without euro loan value and unit price	20538832	100%	59%
Remove negative or missing quantities	17924519	87%	51%
Remove loan value is not equal to quantiy * unit price	17353980	97%	50%
Remove intragroup trades	16199083	93%	47%
Remove double reporting by both trading parties	15816446	98%	45%
Remove non-EU trades	15816332	98%	45%

In a final step, we address the multiple entries of a single transaction and identify a unique observation for each. Earlier we kept only a single transaction per trading party, defined as the last reported modification on the first reporting day. To address the double reporting by both trading parties we firstly rely on all matches based on the Unique Transaction Identifier (UTI) and trading parties, which should be unique for each corresponding trade. If both trading parties report, we keep the report with the best data quality, based on the loan value, quantity, lending fee and collateral fields. This leaves us with 373,962 unique transactions from identified matches and 15,451,159 unmatched observations.

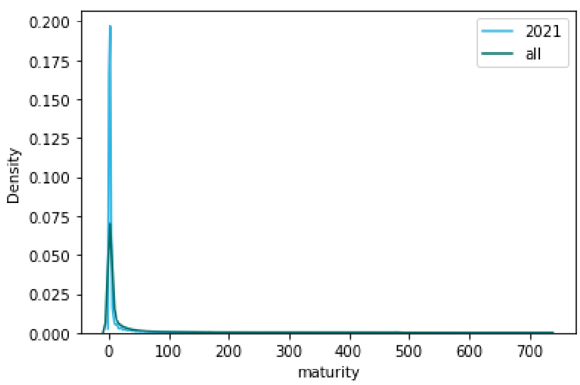
To account for potential misreporting of UTI's preventing a match, we manually check for double entries with the same trading parties, execution date, value date, security ID and loan value or quantity. This allows us to identify an additional 7,238 unique trades. For the remaining transactions, we find that a majority are trades between brokers and very small clients, which do not report themselves. The rest of these trades have only one trading party registered in the EU, and thus simply have no opposite leg reported. Finally, we remove the small share of all trades which have both trading partners' parent companies outside the EU for confidentiality reason.

Appendix B Maturity of a transaction

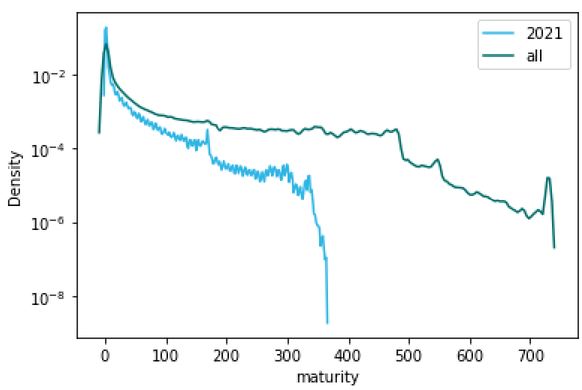
Unfortunately, it is difficult to determine the maturity of a transaction in the SFTR dataset. This is mainly due to the fact that most transactions are evergreens and have no predetermined maturity date, which is therefore missing in the data. Because of this, we have to rely on the final reporting date to determine the effective maturity date. However this method also has some drawbacks. First we cannot use the daily overview of outstanding transactions as in this overview transactions with similar characteristics are often grouped together in one report, with a changing quantity over time. This makes it impossible to determine when a separate yet identical transaction ends. Our solution is to use the transaction reports and take the last report of a specific transaction (UTI) as its maturity date. This method has as a downside that we underestimate the maturity if there is no transaction update on the real maturity date.

As we only keep trades opened and matured in 2021 we run the risk of introducing a bias in our data towards trades with low maturities. The impact is shown in figure B.8a which depicts the distribution of maturities for the whole dataset and the final cleaned dataset. We find that both distributions have a similar peak of 0-1 month maturity and a slowly declining density for longer maturities. As expected the 2021 distribution has fewer transactions of longer maturities than the whole dataset, however we find the biggest impact on transactions with maturities of 11 months or longer, which is only a small portion of the total.

Figure B.8 Maturity distribution all transactions and 2021 transactions



(a) Normal scale



(b) Log scale

Appendix C Labeling of trading parties

In this appendix we further explain how we made the distinction between different types of trading parties. Private clients are easily identified as they are trading parties that have private client id's instead of LEI codes. To define lenders and borrowers we have to define a cutoff percentage of the loan value that is lend or borrowed respectively. Figure C.9 shows that there is a clear group of trading parties that lent either none of all of their transactions. For this reason we chose a strict cutoff of 99% of loan value lent or borrowed to define lenders and borrowers.

The distinction between broker-dealers and lenders is less obvious. We, therefore analyze the distribution of number of counterparties for both broker-dealers and traders. We find a large group of trading parties with only 25 or less counterparties. After that we see an ever more sparse distribution with a distinct break between 75 and 100 counterparties. Above 100, we see density increasing again. We, thus, decide to set out cut-off at a minimum of 100 distinct counterparties for broker-dealers, capturing that they by definition have a large number of counterparties and hence can make a living from the small profit margins between lending and borrowing.

Figure C.9 Fraction of lending over borrowing.