

The U.S. Bilateral Repo Market: Lessons from a New Survey

by *Viktoria Baklanova, Cecilia Caglio, Marco Cipriani, Adam Copeland*¹

We provide aggregate statistics on U.S. dealers' bilateral repurchase agreements and economically equivalent securities lending activities. The data were collected from the U.S.-affiliated securities dealers of nine bank holding companies under a voluntary pilot program run by the Office of Financial Research (OFR) and the Federal Reserve System with input from the Securities and Exchange Commission. We found that the majority of this activity involves the delivery or receipt of U.S. Treasuries, with equities a distant second. The most common maturity is one day. Finally, rates are widely dispersed across asset classes.

Repurchase agreements (repos) are financial contracts in which one party sells a security to the other with the promise to repurchase it at a later date for a previously specified price. Securities dealers use repos to borrow funds on a collateralized basis, to provide funding to others, and to borrow or lend specific securities using cash as collateral. Repo markets are an important component of the U.S. financial system. They are a key source of funding for securities dealers and their clients, and they provide secondary market liquidity for a variety of U.S. securities, such as U.S. Treasuries and agency mortgage-backed securities. They also play an important role in the pricing and price discovery of cash and derivatives instruments. However, repo contracts may also be a source of systemic risk in financial markets because of the potential for fire sales.²

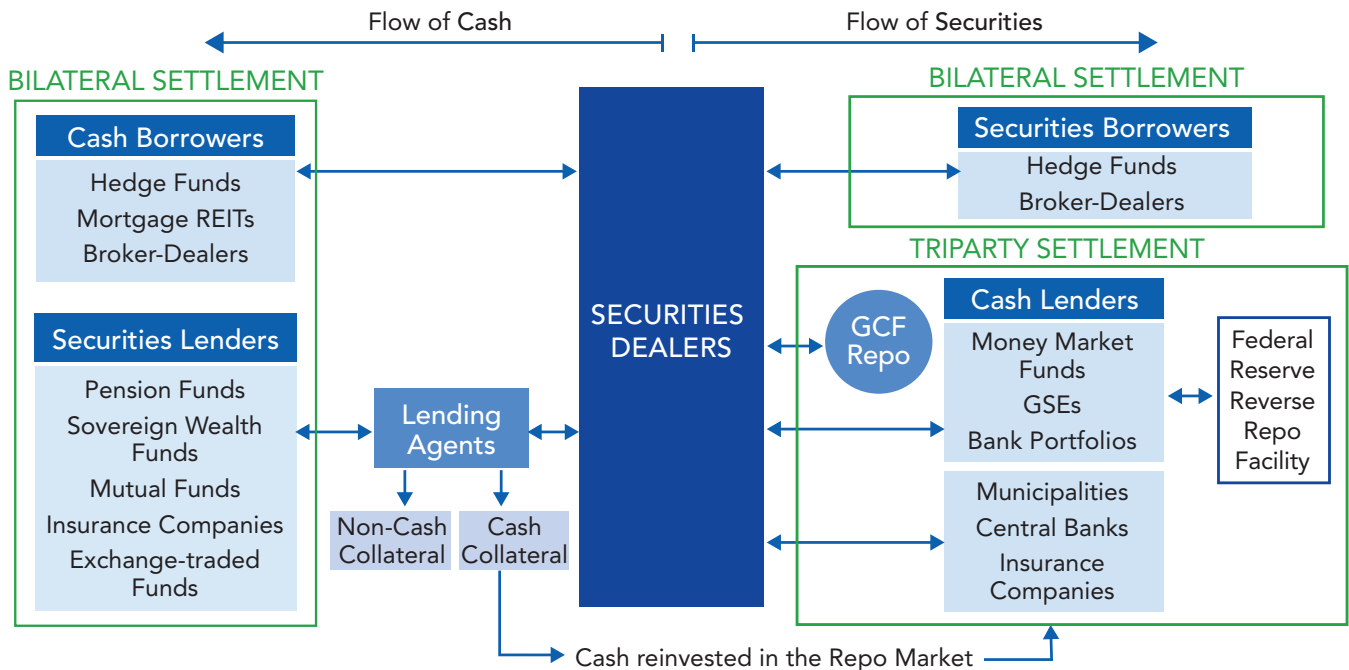
In the United States, the repo market can be separated into two segments based on differences in settlement. In triparty repos, clearing and settlement occurs through a settlement system operated by a clearing bank that provides collateral valuation, margining, and management services to ensure the terms of the repo contract are met.³ In contrast, for bilateral repo, the lender is responsible for the valuation and

margining of the collateral pledged by the borrower.

Before the 2007-09 financial crisis, regulators and policymakers in the United States had only limited access to data on repo activity, which impeded their ability to identify emerging risks in these markets and make well-informed policy decisions. Since then, in line with the Financial Stability Board recommendation for timely and comprehensive collection of repo data, steady progress has been made on data collection for repo activity that settles on the clearing banks' triparty repo platforms.⁴ Until now, however, U.S. regulators and policymakers have not collected detailed data on bilateral repo activity. Addressing this data gap is important because bilateral trades constitute a major segment of the U.S. repo market, as we show in this brief.⁵

In 2014, the OFR and the Federal Reserve System, with input from the Securities and Exchange Commission, launched a voluntary pilot data collection focused on the bilateral repo market. Nine bank holding companies (BHCs) participated in the pilot on a voluntary basis, reporting trades executed by all of their U.S. BHC-affiliated securities dealers. Although the pilot initially focused on

Figure 1: Key Secured Financing Market Participants



Notes: REITs = real estate investment trusts. GCF = general collateral financing trades. GSEs = government-sponsored enterprises.

Source: OFR analysis

collecting data on bilateral repo trades, we broadened the pilot on advice from participating dealers to include economically equivalent trades documented under securities lending agreements. Indeed, the economic effect of a repo contract can also be accomplished using a securities lending contract in which a security is lent (for a fee) using cash as collateral.⁶ The participating dealers reported that counterparties sometimes preferred to use a securities lending contract when negotiating an exchange of cash for collateral, perhaps reflecting differences in prevailing market practice or regulatory requirements. By collecting data on repos and securities lending trades against cash, we aimed to get a more complete picture of the bilateral repo market.

We collected three snapshots of the repo books at the closing of three reporting days in 2015: January 12, February 10, and March 10. The three days were chosen to coincide with the Federal Reserve Bank of New York’s publication of triparty repo statistics.⁷ We collected transaction-level details about all outstanding U.S.-dollar-denominated bilateral repo and securities lending contracts against cash at the end of these dates, including the cash principal amount, the interest rate on the cash, the maturity of the repo, the value and type of securities delivered, the haircut applied to those securities, and the counterparty to the transaction (see **Table A, Appendix**).⁸

Figure 1 shows participants in the repo and securities lending market in the United States. Our pilot covers a subset. Securities dealers generally use triparty repo to borrow from cash lenders (for instance, money market mutual funds). In contrast, securities dealers enter into bilateral repo contracts for a variety reasons, including to secure additional funding (see the top right corner of Figure 1) as well as to provide funding to others (see the top left corner of Figure 1).⁹ By expanding the pilot to include securities lending contracts against cash, we also captured some of the activity by securities lending agents (see the lower left corner of Figure 1).¹⁰

Data Analysis

In this section, we describe the data collected. We refer to all transactions in which the dealer receives securities in exchange for lending cash as “securities in” transactions, regardless of whether the transaction is documented as a repurchase agreement or securities lending. Similarly, we refer to all transactions in which the dealer delivers securities in exchange for borrowing cash as “securities out” transactions.

Table 2: Summary Statistics

Date	Value Transacted (\$ billions)		Number of Trades		Pilot as a Percent of Total Bilateral Repo Market	
	Sec In	Sec Out	Sec In	Sec Out	Sec In	Sec Out
12-Jan-15	1,574	921	486,433	209,095	52	51
10-Feb-15	1,648	969	511,254	202,432	54	53
10-Mar-15	1,693	986	518,483	187,505	53	53
Average	1,638	959	505,390	199,677	53	52

Notes: “Sec In” is securities in and “Sec Out” is securities out. “Pilot as a Percent of Total Bilateral Repo Market” is the ratio of value transacted in the bilateral repo pilot over the bilateral repo segment estimates presented in Table B in Appendix. For some of the trades we did not report principal amounts. These trades account for 0.2 percent of the principal value for the Feb. 15 and March 15 dates.

Sources: Bilateral repo data collection pilot, authors’ calculations.

Table 2 reports the aggregate principal amount for securities in and securities out for each of the three reporting days. Over the three days, securities dealers lent an average of \$1.6 trillion and borrowed an average of \$1 trillion. To gain a sense of the pilot’s coverage of the entire market, we compare these totals to estimates of the total market.¹¹ For both securities in and securities out, we found that the total value of bilateral repo and securities lending against cash captured in the pilot amounts to about half of the estimated size of the bilateral repo and securities lending against cash market.¹²

In the data, dealers flagged transactions in which the counterparty is part of the same bank holding company as the dealer. We found these interaffiliate trades made up 31 percent of our data on a dollar-value basis. Breaking it down further, we found that 25 percent of securities in and 41 percent of securities out transactions are interaffiliate. Because it is unclear whether these types of trades are done at arms-length, we removed them from all the remaining statistics in the paper. The average total value of securities in drops from \$1.638 trillion to \$1.233 trillion without interaffiliate trades and the average total value of securities out drops from \$959 billion to \$567 billion.

Next, we examined the use of repurchase agreements versus securities lending contracts. Overall, we found that repurchase agreements account for the majority of activity encompassed by the pilot on a dollar-value basis, but securities lending contracts account for the majority of trades. Table 3 reports the use of securities lending contracts by asset class. We found that securities lending contracts are

used almost exclusively when dealers exchange equities for cash and are heavily relied on when dealing with corporate securities. In contrast, repurchase agreements are mostly used for U.S. Treasuries and agency securities.

Table 3: Securities Lending Transactions as a Percent of Total, by Asset Class (percent)

Asset Class	Principal Value-Weighted	
	Sec In	Sec Out
U.S. Treasuries	27.2	3.7
Equities	99.9	100.0
Private-Label CMO, MBS, ABS	7.4	d
Corporate	72.7	49.7
Other Agency	3.5	-
Municipality Debt	4.8	d
Agency MBS	4.6	-
Other	d	d
All asset classes	43.0	19.8

Notes: Values are averaged across three reporting dates, affiliate trades excluded. Each trade is classified as a repurchase agreement or a securities lending contract. Each element in the table reports the share of securities lending contracts as a percent. Asset classes are ordered from largest to smallest in terms of principal value. “Sec In” is securities in and “Sec Out” is securities out; “d” means the number is omitted to not reveal an individual dealer’s information. CMO=collateralized mortgage obligation. MBS=mortgage-backed securities. ABS=asset-backed securities.

Sources: Bilateral repo data collection pilot, authors’ calculations.

Table 4: Securities In and Out by Asset Class

Asset Class	Principal Value (\$ billions)		Principal-weighted Share (percent)	
	Sec In	Sec Out	Sec In	Sec Out
U.S. Treasuries	711.5	416.4	61.4	81.0
Equities	244.4	78.9	21.1	15.3
Private Label CMO, MBS, ABS	110.2	3.4	9.5	0.7
Corporate	76.7	15.2	6.6	3.00
Other Agency	13.7	d	1.2	d
Municipality Debt	1.1	0.0	0.1	0.0
Agency MBS	d	d	d	d
Other	d	d	d	d
Total	1,158.6	514.3	100	100

Notes: Values are averaged across three reporting dates, affiliate trades excluded. "Sec In" is securities in and "Sec Out" is securities out. Asset classes are ordered from largest to smallest in terms of principal value. Note that for some of the contracts we did not have collateral information; their total principal value was \$75 billion for securities in and \$53 billion for securities out; "d" means the number is omitted to not reveal an individual dealer's information. CMO=collateralized mortgage obligation. MBS=mortgage-backed securities. ABS=asset-backed securities.

Sources: Bilateral repo data collection pilot, authors' calculations.

Table 4 reports bilateral repo and securities lending against cash activity by asset class. Transactions involving U.S. Treasuries represented 61 percent of the value for securities in and 81 percent for securities out. The second largest asset class was equities, which represented 21 percent of securities in and 15 percent of securities out by value. Other important asset classes were private-label structured products (collateralized mortgage obligations, mortgage-backed securities, and asset-backed securities) and corporate debt.

Table 5 reports information on the maturities of the bilateral repo and securities lending against cash trades by asset class. Most contracts have very short maturities; more than half of trades collateralized by U.S. treasuries are overnight or open trades (trades that can be recalled at any time). About 28 percent of the trades have a maturity of up to a month, and only 19 percent of transactions have a maturity longer than one month. Bilateral trades involving equity securities have even shorter maturities with 94 percent being open, reflecting the dominant use of securities lending contracts to document these trades.

Table 6 shows overnight interest rates by asset classes. Negative rates indicate the security borrower is paying interest to the lender to obtain a security in scarce supply; positive rates indicate the cash borrower paid an interest rate to borrow cash. For most asset classes, interest rates

Table 5: Maturities by Asset Class

Maturity	Principal-weighted Share (percent)		
	U.S. Treasuries	Equities	Other
Open	20.2	93.9	37.4
Overnight	32.0	0.0	10.3
1 day < maturity <= 7 days	13.1	0.0	2.3
7 days < maturity <= 30 days	15.4	0.1	7.6
30 days < maturity <= 1 year	18.8	3.8	37.8
maturity > 1 year	0.4	2.2	4.7

Notes: Values are averaged across three reporting dates, affiliate trades excluded. Each column sums to 100. For trades with maturity optionality, such as a put or call, maturity is equal to the notice period. Not all trades have maturity information; trades with no maturities account for 15.6 percent of the principal value. CMO=collateralized mortgage obligation. MBS=mortgage-backed securities. ABS=asset-backed securities.

Sources: Bilateral repo data collection pilot, authors' calculations.

Table 6: Principal Value-Weighted Overnight Interest Rates (percent)

Asset Class	Securities In		Securities Out	
	Mean	Median	Mean	Median
U.S. Treasuries	0.05	0.11	-0.01	0.05
Equities	-0.85	0.03	-0.55	0.03
Corporate	-0.17	0.11	-0.39	0.03
Private Label CMO, MBS, ABS	0.18	0.20	0.10	0.06
Municipality Debt	0.53	0.55	d	d
Other Agency	0.20	0.21	-	-
Agency MBS	0.17	0.17	-	-
Other	-	-	d	d
Average	-0.32	0.10	-0.16	0.05

Notes: Values are averaged across three reporting dates, affiliate trades excluded. Asset classes are ordered from largest to smallest principal value. For some of the trades, we did not have interest rate information. We omitted interest rate data submitted by one respondent because of data quality issues. Trades with missing rate information account for 0.01 percent of the principal value; "d" means the number is omitted to not reveal an individual dealer's information. CMO=collateralized mortgage obligation. MBS=mortgage-backed securities. ABS=asset-backed securities.

Sources: Bilateral repo data collection pilot, authors' calculations.

are positive, that is, on average, the cash borrower paid interest to the lender. The exceptions are equities and corporate securities in which the average interest rates are negative, indicating the borrowed securities in these asset classes are in scarce supply. Note that although average rates were negative, the median rates for equities and corporates were still positive, that is, the distribution was skewed to the left. Negative interest rates on some hard-to-borrow securities drove the mean rate below zero.

Lessons Learned

In addition to collecting valuable quantitative information on bilateral activity in the U.S. securities financing market, the pilot was successful in identifying specific challenges of collecting this type of market data, including these three:

- (1) Limited scope of the pilot data collection
- (2) Lack of data standards
- (3) Separate data systems

Limited scope of the pilot data collection — Because this pilot included only a limited number of major U.S. broker-dealers, leaving out smaller market participants, it still does not provide a full picture of this market. For example, the pilot data are insufficient to capture the full size of activity conducted beyond the primary dealers. Although we do not believe that dealers that are not primary represent a substantial amount of repo activity, this assumption could change over time due to a potential migration of activities. Currently, we cannot properly track this migration due to the pilot's limited scope and recognize the need for larger scope in data collections covering the repo market.

Lack of data standards — Given the voluntary nature of the pilot, the collection attempted to leverage the participating firm's internal reporting systems, rather than impose external requirements. The lack of data standards undermined the quality of the data we received. In particular, a lack of standardized counterparty information, such as a legal entity identifier (LEI), limited our ability to analyze market interconnectedness because the same firm had different names in dealers' reporting systems. Repo market participants are not currently required to use LEIs in regulatory reporting, although many filing forms recommend LEIs or list them as an option. Without LEIs and associated mapping to specific industry sectors, identification of counterparties is a substantial challenge. Although we requested industry sector information for counterparties

for the pilot, inconsistent sector mapping by participating firms resulted in low-quality counterparty data. In future collections, having respondents submit their counterparties' LEIs would greatly increase the value of data.

Separate data systems — The reporting systems of participating firms have evolved to meet their business needs and were not designed to support reporting of granular data at the enterprise level. For example, data elements specific to a trade, such as principal amount and rate, are kept in one trading system, while counterparty data might be kept in a separate back office system. This example illustrates that firms face challenges in responding with their existing reporting systems to ad hoc collections of trade-level data. A more permanent collection might create incentives for firms to invest in automating the generation of this type of report, reducing manual interventions and making the process more efficient.

Next steps

High-quality data covering bilateral dealing in securities financing markets are needed for both the industry and regulators, but comprehensive data is still lacking. Although the pilot data collection was a useful exercise in gaining a better understanding of the market infrastructure, it did not provide comprehensive coverage due to its limited scope and challenges related to data quality.

To close this data gap, financial regulators are working together to develop a permanent granular data collection of bilateral securities financing trades, building on the lessons learned from this pilot data collection. Reporting definitions, concepts, and requirements should be consistent with collections covering the triparty repo segment. Mandatory data standards would reduce reporting burdens and improve data quality. U.S. regulators are working with international regulatory bodies such as the Financial Stability Board to harmonize reporting definitions, concepts, and requirements.

Appendix

Table A: Bilateral Repo Pilot Reporting Fields

Col #	Field Name
1	Transaction ID
2	Allocation ID
3	Timestamp of Execution
4	Legal Agreement Type
5	Securities In or Securities Out
6	Security Dealer Legal Entity
7	Counterparty Legal Entity
8	Counterparty Legal Entity Name
9	Counterparty Top-Tier Parent Company Name
10	With Related Party or Affiliate? (Yes/No)
11	Counterparty Legal Entity Type (Sector)
12	Cleared through FICC? (Yes/No)
13	Start Date
14	Rate, or Rate Spread over Benchmark
15	Benchmark
16	End Date
17	Open Maturity Date? (Yes/No)
18	Optionality Indicator
19	Notice Period
20	Allocated ID Type
21	Allocated Security ID
22	Allocated Securities Asset Class
23	Allocated Securities Current Market Value
24	Haircut
25	Principal

Source: Bilateral repo data collection pilot

Table B: U.S. Bilateral Repo Market Estimates
(\$ billions)

	Securities In	Securities Out
12-Jan-15	3,012	1,797
10-Feb-15	3,071	1,822
10-Mar-15	3,169	1,866

Notes: The method used to produce these estimates is detailed in Copeland et al. (2014) (see endnote 11). Bilateral repo estimates are a residual amount, equal to total repo minus triparty repo. Total repo estimates are based on Federal Reserve FR2004 data collected from primary dealers. These figures include both repo and securities lending activity against cash. Triparty repo data include General Collateral Finance Repo.

Sources: For total repo, Federal Reserve Form FR2004; for triparty repo, Federal Reserve Bank of New York.

Endnotes

- ¹ Viktoria Baklanova, Office of Financial Research, e-mail: viktorija.baklanova@ofr.treasury.gov. Cecilia Caglio, Federal Reserve Board of Governors, e-mail: cecilia.r.caglio@frb.gov. Marco Cipriani, Federal Reserve Bank of New York, e-mail: marco.cipriani@ny.frb.gov. Adam Copeland, Federal Reserve Bank of New York, e-mail: adam.copeland@ny.frb.gov. The authors wish to thank Jacob Adenbaum and Ocean Dalton for their excellent research assistance. This paper also appears, without the “Lessons Learned” section, as Federal Reserve Bank of New York Staff Report #758.
- ² See Brian Begalle, Antoine Martin, Jamie McAndrews, and Susan McLaughlin, “The Risk of Fire Sales in the Tri-Party Repo Market,” Federal Reserve Bank of New York Staff Report # 616, May 2013 (available at https://www.newyorkfed.org/medialibrary/media/research/staff_reports/sr616.pdf, accessed December 18, 2015). For issues related to systemic risk, see Gary Gorton and Andrew Metrick, “Securitized Banking and the Run on Repo,” *Journal of Financial Economics*, Vol. 104, No. 3, 2012 and Adam Copeland, Antoine Martin, and Michael Walker, “Repo Runs: Evidence from the Tri-party Repo Market,” *The Journal of Finance*, Vol. 69, No. 6, 2014. For a description of various ways runs can occur in the repo markets, see Arvind Krishnamurthy, Stefan Nagel, and Dmitry Orlov, “Sizing Up Repo,” *The Journal of Finance*, Vol. 69, No. 6, 2014.
- ³ The General Collateral Finance Repo (GCF Repo[®]), a financial service offered by the Fixed Income Clearing Corporation and the two large-dealer clearing banks (JP Morgan Chase and Bank of New York Mellon), also settles on the clearing banks’ triparty repo settlement platforms. GCF Repo allows securities dealers to exchange government securities among themselves for cash anonymously.
- ⁴ For details on the Financial Stability Board’s recommendations on repo and securities lending, see Financial Stability Board, “Strengthening Oversight and Regulation of Shadow Banking Policy Framework for Addressing Shadow Banking Risks in Securities Lending and Repos: Financial Stability Board consultative paper,” August 29, 2013 (available at http://www.fsb.org/wp-content/uploads/r_130829b.pdf?page_moved=1, accessed December 18, 2015).
- ⁵ See Viktoria Baklanova, Adam Copeland, and Rebecca McCaughrin, “Reference Guide to U.S. Repo and Securities Lending Markets,” OFR Working Paper 15-17, September 9, 2015 (available at http://financialresearch.gov/working-papers/files/OFRwp-2015-17_Reference-Guide-to-U.S.-Repo-and-Securities-Lending-Markets.pdf, accessed December 18, 2015).
- ⁶ Not all securities lending contracts replicate the payoff of a repo agreement. In particular, under a securities lending contract, a security can also be lent using an asset other than cash as collateral. This type of securities lending transaction is beyond the scope of the pilot.
- ⁷ See Tri-Party Repo Infrastructure Reform website for aggregate statistics on triparty repo and GCF Repo activity, “Tri-party Repo Statistical Data,” online content (available at www.newyorkfed.org/banking/tpr_infr_reform_data.html, accessed December 18, 2015).
- ⁸ Specifically, we included transactions executed under master repurchase agreement (MRA) or global master repurchase agreement (GMRA), as well as those trades executed under securities lending master agreement (SLMA) or global securities lending master agreement (GSLMA) when securities were exchanged for cash.
- ⁹ For a more detailed overview of the repo and securities lending markets, see Baklanova, Copeland, and McCaughrin (2015).
- ¹⁰ As illustrated in Figure 1, securities lending agents often reinvest their cash collateral in the triparty repo market. For a description of this reinvestment strategy and its risks, see Frank Keane, “Securities Loans Collateralized by Cash: Reinvestment Risk, Run Risk, and Incentive Issues,” Federal Reserve Bank of New York Current Issues, Vol 19, No. 3, 2013 (available at https://www.newyorkfed.org/medialibrary/media/research/current_issues/ci19-3.pdf, accessed December 18, 2015).
- ¹¹ See Adam Copeland, Isaac Davis, Eric LeSueur, and Antoine Martin, “Lifting the Veil on the U.S. Bilateral Repo Market,” online paper, June 9, 2014 (available at <http://libertystreeteconomics.newyorkfed.org/2014/07/lifting-the-veil-on-the-us-bilateral-repo-market.html#.Vo71OnarRaQ>, accessed December 18, 2015).
- ¹² The estimates of the size of the bilateral repo market are provided in Table B in the appendix.