

The U.S. Treasury Market During the COVID-19 Crisis



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In this report, the Committee on Capital Markets Regulation (the “**Committee**”) describes the turmoil in the U.S. Treasury market during March 2020, with a focus on the unexpected rise in Treasury yields, the illiquidity in the Treasury market and the subsequent intervention by the Federal Reserve to stabilize the market. We then describe the market structure for trading U.S. Treasuries as well as trade reporting requirements and public information regarding the owners of Treasuries. We find that policymakers and the public lack the transaction data to comprehensively determine the source of selling in March 2020 that drove the volatility in the U.S. Treasury market.

Policymakers have sought to identify the source of the selling pressure in the Treasury market in March 2020 because holders of U.S. Treasuries, including large financial institutions and foreign investors, rely on the assumption that Treasuries are cash-like instruments.¹ For U.S. Treasuries to continue to function as a global safe haven asset, Treasuries must retain their value and trade efficiently during market crises. Identifying the source of the selling pressure in March 2020 would enable policymakers to determine whether changes to regulation or market structure are necessary to allow the Treasury market to better accommodate such selling in the future. Indeed, understanding the potential sources of fragility in the Treasury market remains important, as periodic bouts of volatility persist—most recently in February 2021.²

In Part I of our report, we summarize the volatility in the U.S. Treasury market in March 2020 and the Federal Reserve’s role in stabilizing the market. In Part II, we provide a comprehensive overview of the market structure for trading U.S. Treasuries (so-called “**cash Treasury**” markets), including the respective role of broker-dealers, proprietary trading firms, institutional investors and trading venues. Part II then describes the trade information for U.S. Treasuries available to regulators from the Financial Industry Regulatory Authority’s Trade Reporting and Compliance Engine (“**FINRA’s TRACE database**”). Finally, in Part III we evaluate public disclosures of ownership information and trade data for U.S. Treasuries, including data provided by the Federal Reserve and U.S. Treasury Department regarding institutional investors, foreign investors and foreign official investors (such as central banks and sovereign wealth funds). We also review public disclosures regarding the U.S. Treasury holdings of hedge funds and mutual funds.

We conclude that policymakers and the public lack the trade and ownership information necessary to comprehensively determine the source of selling in the Treasury market in March 2020. We therefore recommend that policymakers exercise caution before reaching conclusions or enacting regulations related to the March 2020 spike in Treasury yields. An appropriate first step for policymakers would be to consider whether expanded reporting obligations for participants in the U.S. Treasury market are warranted. In addition, policymakers should continue to study activity in the U.S. Treasury market to determine whether other reforms could enhance its efficiency, resiliency and transparency.

¹ Arvind Krishnamurthy & Annette Vissing-Jorgensen, *The Aggregate Demand for Treasury Debt*, 120 J Pol. Econ. 233 (April 2012).

² Vivien Lou Chen & Greg Ritchie, *Treasury Yields Surge Past 1.6%, Sounding Alarm for Risk Assets*, Bloomberg News (Feb. 25, 2021), <https://www.bloomberg.com/news/articles/2021-02-25/u-s-10-year-real-rate-breaches-post-election-november-high?sref=2lCQoM0A>.

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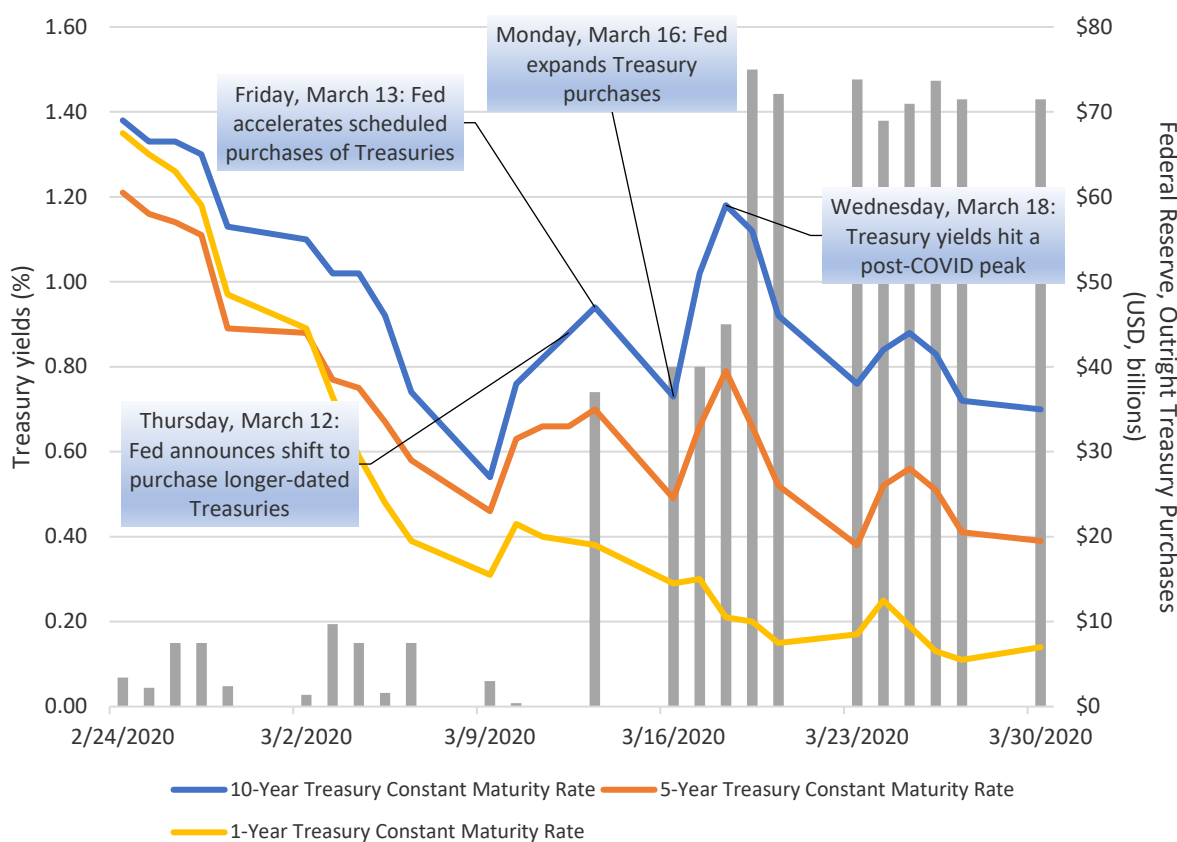
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Part I: Treasury Market Activity in March 2020

The Treasury market turmoil in March 2020 was triggered by a large sell-off of Treasuries. That sell-off was reflected in a significant increase in trading volume, and led to an increase in yields and liquidity strains in the Treasury market. We note that the data included in Part I are often derived from FINRA’s TRACE database. In Part II B, we provide an overview of the reporting obligations of market participants in the Treasury market to FINRA’s TRACE database and certain key limitations of FINRA’s database.

Figure 1 below shows yields for 1-year, 5-year and 10-year Treasury bonds (left axis)³ and the Fed’s Treasury purchases (right axis)⁴ between February 24 and March 30, 2020 during the peak of the COVID crisis in financial markets.

Figure 1. Treasury Yields and Fed Purchases (February - March 2020)



³ Board of Governors of the Federal Reserve System (Federal Reserve), *1-Year Treasury Constant Maturity Rate*, Federal Reserve Bank of St. Louis, <https://fred.stlouisfed.org/series/DGS1>; *5-Year Treasury Constant Maturity Rate*, Federal Reserve Bank of St. Louis, <https://fred.stlouisfed.org/series/DGS5>; *10-Year Treasury Constant Maturity Rate*, Federal Reserve Bank of St. Louis, <https://fred.stlouisfed.org/series/DGS10> Data on Treasury yields is retrieved from FRED, Federal Reserve Bank of St. Louis; <https://fred.stlouisfed.org/series/>.

⁴ FRBNY, *Treasury Securities Operations*, <https://www.newyorkfed.org/markets/desk-operations/treasury-securities>.

As **Figure 1** demonstrates, Treasury yields followed a familiar pattern at the start of the COVID-19 crisis in February until Monday, March 9: as investors began to fear the negative economic effects of COVID-19, they sold risky assets and bought Treasuries, pushing the price of Treasuries of all maturities up and causing yields to fall dramatically. Such investor behavior is consistent with past market crises; indeed, this is what happened in 2008.⁵ As demand for Treasuries increased, so did trading volume. Trading of Treasuries by primary dealers was the highest on record, peaking at an average daily trading volume of more than \$1 trillion at the beginning of March.⁶

However, beginning on Monday, March 9, yields on Treasuries began to sharply increase, as the supply of Treasuries available for sale exceeded the demand to buy Treasuries. Widespread selling pressure for Treasuries had not previously occurred during a market crisis. As reflected in **Figure 1**, Treasury yields increased from Monday, March 9 until Friday, March 13. Data from FINRA on overall trading volume and from the New York Fed on trading by primary dealers confirm that trading volumes in the Treasury market continued to remain elevated.⁷

Presumably owners of Treasuries either preferred to hold cash rather than Treasuries due to the economic situation or, more likely, needed to liquidate Treasuries for cash to satisfy cash demands.⁸ Cash demands could come, for example, from: mutual funds needing to redeem withdrawing investors; foreign central banks that needed immediate dollar cash liquidity to support their local financial markets or brokers and investors needing to satisfy clearinghouse margin calls.⁹ While there is some publicly available information on trading or changes in position by various types of entities during March 2020, it is insufficient to accurately pinpoint the respective role of each type of entity in the sell-off—these shortcomings are described in more detail in Part II.C.

Evidence suggests that the rise in Treasury yields reflected strains in the Treasury market's ability to handle the selling pressure. One way to measure liquidity conditions in the Treasury market is based on the difference between the yields of similar recently issued, more frequently traded (on-the-run) Treasury securities and older, less frequently traded (off-the-run) Treasury securities. Because these securities have equivalent maturities, coupons and default risk, any difference in yields is a proxy for the premium that investors pay for more liquid Treasuries—a widening spread reflects deterioration in the liquidity of off-the-run securities relative to on-the-run securities.¹⁰ During the second week of March, the spread more than quadrupled.¹¹

⁵ Zhiguo He & Arvind Krishnamurthy, *Are US Treasury Bonds Still a Safe Haven?*, NBER Reporter (Oct. 2020), <https://www.nber.org/reporter/2020number3/are-us-treasury-bonds-still-safe-haven>.

⁶ FRBNY, *Primary Dealer Statistics*, <https://www.newyorkfed.org/markets/counterparties/primary-dealers-statistics>.

⁷ FINRA, *Treasury Aggregate Statistics*, <https://www.finra.org/finra-data/treasury-weekly-aggregates> (weekly trading volume in all Treasury securities for the week ended March 13 was \$4.9 trillion); FRBNY, *Primary Dealer Statistics*, <https://www.newyorkfed.org/markets/counterparties/primary-dealers-statistics> (average daily trading volume by primary dealers for the weeks ended March 11 and March 18 was \$869 billion and \$771 billion, respectively).

⁸ Financial Stability Oversight Council (FSOC), *2020 Annual Report 27–29* (Dec. 2020).

⁹ BlackRock, *Lessons from COVID-19: Market Structure Underlies Interconnectedness of the Financial Market Ecosystem 6* (Nov. 2020).

¹⁰ Tobias Adrian, Michael Fleming & Erik Vogt, *An Index of Treasury Market Liquidity: 1991-2017*, FRBNY Staff Report No. 827 (Oct. 2017).

¹¹ Bank for International Settlements, *Annual Economic Report 44* (June 2020).

Another measure of Treasury market liquidity is the bid-ask spread on the automated electronic venues where dealers trade with one another and with other institutional intermediaries (the interdealer market). In March, bid-ask spreads in the interdealer market increased sharply, peaking on March 13 (for ten- and thirty-year Treasuries) and March 16 (five-year).¹² The presence of significant strain on the Treasury market during this period is confirmed by the volatility of Treasury yields, which reached a peak on March 19 that exceeded the volatility at the height of the 2008 financial crisis.¹³

Fed Action to Support the Treasury Market

As further depicted in **Figure 1**, on Friday, March 13th the Fed began to take action to stabilize the U.S. Treasury market by purchasing Treasuries to offset the sharp rise in selling pressure. First, on March 13th, the Fed purchased \$37 billion in Treasuries, an acceleration of the Fed's already planned purchases of Treasuries for the rest of March.¹⁴ Thus, these purchases represented only a change in the timing, not the overall volume, of scheduled Treasury purchases.

Then on Sunday, March 15th, the Fed announced that it would increase its Treasury holdings over the coming months by “at least \$500 billion.”¹⁵ The Fed further specified that on Monday, March 16th, it would buy \$40 billion of Treasuries and that the daily “pace of purchases will be adjusted as appropriate to support the smooth functioning of the Treasury market.”¹⁶ At the time, the Fed held approximately \$2.5 trillion in U.S. Treasuries and had scheduled purchases of approximately \$80 billion per month in the coming months.¹⁷ The Fed's announcement therefore significantly increased the pace of purchases in the coming months and would meaningfully increase the overall size of the Fed's holdings of U.S. Treasuries.

Treasury Market Reaction to Fed Purchases

As demonstrated by **Figure 1**, on Monday, March 16th, Treasury yields declined, apparently in response to the Fed's announcements and purchases of Treasuries.¹⁸ On Tuesday, March 17th, the Fed again bought \$40 billion in Treasuries.¹⁹ However, on Tuesday, March 17th, Treasury

¹² Michael Fleming & Francisco Ruela, *Treasury Market Liquidity during the COVID-19 Crisis*, Liberty Street Economics (April 17, 2020), <https://libertystreeteconomics.newyorkfed.org/2020/04/treasury-market-liquidity-during-the-covid-19-crisis.html>.

¹³ Chicago Board Options Exchange, *CBOE 10-Year Treasury Note Volatility Futures*, Federal Reserve Bank of St. Louis, <https://fred.stlouisfed.org/series/VXTYN>.

¹⁴ Federal Reserve Bank of New York (FRBNY), *Statement Regarding Treasury Reserve Management and Reinvestment Purchases* (March 13, 2020), https://www.newyorkfed.org/markets/opolicy/operating_policy_200313; FRBNY, *Treasury Securities Operational Details: Results* (March 13, 2020), <https://markets.newyorkfed.org/api/tsy/all/results/details/search.xlsx?startdate=03/13/2020&enddate=03/13/2020&securityType=treasury>.

¹⁵ FRBNY, *Statement Regarding Treasury Securities, Agency Mortgage-Backed Securities, and Repurchase Agreement Operations* (March 15, 2020), https://www.newyorkfed.org/markets/opolicy/operating_policy_200315.

¹⁶ *Id.*

¹⁷ FRBNY, *Tentative Schedule of Treasury Securities Operations: 2/14/2020 to 3/12/2020*, <https://www.newyorkfed.org/medialibrary/media/markets/treasury-securities-schedule-past/HTPC-0214-0312-2020.pdf>.

¹⁸ Federal Reserve, *Selected Interest Rates Instruments – H.15* (March 16, 2020), Federal Reserve Bank of St. Louis, <https://fred.stlouisfed.org/release/tables?rid=18&eid=289&od=2020-03-16#>.

¹⁹ FRBNY, *Treasury Securities Operational Details: Results* (March 17, 2020), <https://markets.newyorkfed.org/api/tsy/all/results/details/search.xlsx?startdate=03/17/2020&enddate=03/17/2020&securityType=treasury>.

yields *increased* as the Fed’s purchases were insufficient to offset the continued selling demands of Treasuries by other investors.²⁰ On Wednesday March 18th, the Fed increased its daily purchase to \$45 billion of Treasuries; however, Treasury yields continued to increase.²¹

On Thursday, March 19th the Fed further increased the size of its daily purchases of Treasuries from \$45 billion per day to \$75 billion per day.²² Treasury yields immediately began to decrease as the demand to purchase Treasuries was now sufficient to exceed selling pressure.²³ On March 23, the Fed announced that it would increase its holding of Treasury securities “in the amounts necessary to support the smooth functioning of markets for Treasury securities.”²⁴ As demonstrated by **Figure 1**, the Fed continued to purchase Treasuries at a daily rate of \$75 billion for the rest of March and the Treasury market remained stable.²⁵

The Fed began to slowly reduce its daily purchases of Treasuries beginning on April 2, when it reduced its scheduled purchases to \$60 billion per day.²⁶ Over the course of April, the Fed gradually reduced its daily pace of purchases to \$10 billion per day.²⁷ The Fed continued to reduce its daily pace through June until it reached the current pace of approximately \$80 billion each month (or approximately \$3 billion per day).²⁸ Treasury yields did not experience any further spikes from the end of March until the end of 2020.²⁹ In January 2021, Treasury yields began to increase again, possibly due to an increase in inflationary expectations or expectations of an economic recovery.³⁰ **Figure 2** provides additional detail on the range of Treasury yields and the size of Fed purchases of Treasuries from February 2020 to mid-March 2021.³¹

²⁰ Federal Reserve, *Selected Interest Rates Instruments – H.15* (March 17, 2020), Federal Reserve Bank of St. Louis, <https://fred.stlouisfed.org/release/tables?rid=18&eid=289&od=2020-03-17#>.

²¹ FRBNY, *Treasury Securities Operational Details: Results* (March 18, 2020), <https://markets.newyorkfed.org/api/tsy/all/results/details/search.xlsx?startdate=03/18/2020&enddate=03/18/2020&securityType=treasury>; Federal Reserve, *Selected Interest Rates Instruments – H.15* (March 18, 2020), Federal Reserve Bank of St. Louis, <https://fred.stlouisfed.org/release/tables?rid=18&eid=289&od=2020-03-18#>.

²² FRBNY, *Treasury Securities Operational Details: Results* (March 19, 2020), <https://markets.newyorkfed.org/api/tsy/all/results/details/search.xlsx?startdate=03/19/2020&enddate=03/19/2020&securityType=treasury>.

²³ Federal Reserve, *Selected Interest Rates Instruments – H.15* (March 19, 2020), Federal Reserve Bank of St. Louis, <https://fred.stlouisfed.org/release/tables?rid=18&eid=289&od=2020-03-19#>.

²⁴ FRBNY, *Statement Regarding Treasury Securities and Agency Mortgage-Backed Securities Operations* (March 23, 2020), https://www.newyorkfed.org/markets/opolicy/operating_policy_200323.

²⁵ *Id.*

²⁶ FRBNY, *Tentative Schedule of Treasury Securities Operations: 3/30/2020 - 4/3/2020*, https://www.newyorkfed.org/medialibrary/media/markets/treasury-securities-schedule-past/HTPC_0330_0403_2020.pdf.

²⁷ FRBNY, *Tentative Schedule of Treasury Securities Operations: 4/27/2020 - 5/1/2020*, https://www.newyorkfed.org/medialibrary/media/markets/treasury-securities-schedule-past/HTPC_0427_0501_2020.pdf.

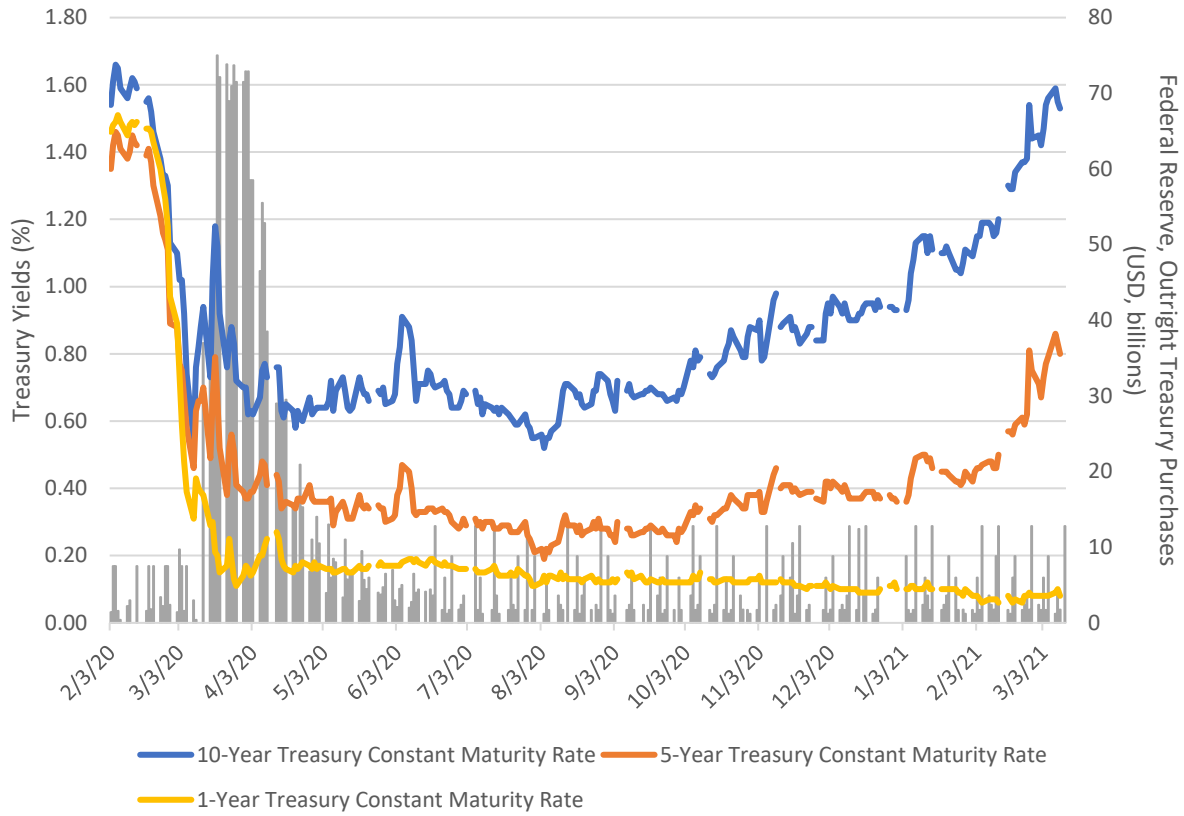
²⁸ FRBNY, *Tentative Schedule of Treasury Securities Operations: 6/12/2020 to 6/25/2020*, https://www.newyorkfed.org/medialibrary/media/markets/treasury-securities-schedule-past/HTPC_0612_0625_2020.pdf.

²⁹ See notes **Error! Bookmark not defined.**–4.

³⁰ *Id.*

³¹ *Id.*

Figure 2. Treasury Yields and Fed Purchases (Feb. 2020 – March 2021)



Part II: Market Structure of Cash Treasuries and Reporting Obligations

A. Treasury Market Structure

The cash Treasury market is the largest and most liquid trading market in the world. According to FINRA data, average daily trading volume in the cash Treasury market for 2020 was approximately \$600 billion.³² By comparison, average daily trading volume in U.S. equity markets for 2020 was \$479 billion.³³ The automated electronic venues that account for the bulk of trading between dealers and other institutional intermediaries offer more liquidity than the markets for the most liquid equity securities. Bid-ask spreads on those venues, for example, tend to be lower than bid-ask spreads for the largest, most liquid equity securities.³⁴ Trade data referred to in Part II A are generally drawn from FINRA’s TRACE database. Part II B provides an overview of the reporting obligations of market participants in the Treasury market and certain limitations of FINRA’s TRACE database.

The cash Treasury market consists of two major segments: the interdealer market and the dealer-to-client market. According to available data, the interdealer market and dealer-to-client market each account for approximately half of trading volume in cash Treasuries: FINRA data show that, between March 2020 and January 2021, approximately 47 percent (\$280 billion) of trading volume in Treasury securities occurred in the interdealer market and the remaining 53 percent (\$320 billion) in the dealer-to-client market.³⁵

Interdealer Market

The interdealer market consists of wholesale trading primarily involving two types of institutional intermediaries: traditional broker-dealers, most of which are affiliated with banking institutions, and principal trading firms (“PTFs”).³⁶ Banks, including domestic and foreign bank affiliates of traditional broker-dealers, and certain institutional investors also participate in the interdealer cash Treasury market.³⁷

According to a report published by researchers at the Federal Reserve that provides the most recent publicly available data on trading volumes in the interdealer market broken down by participant, traditional broker-dealers and PTFs accounted for roughly 42 and 48 percent,

³² FINRA, *Treasury Aggregate Statistics*, <https://www.finra.org/finra-data/treasury-weekly-aggregates..>

³³ SIFMA, *US Equity and Related Securities Statistics*, <https://www.sifma.org/resources/research/us-equity-and-related-securities-statistics/>.

³⁴ Nina Boyarchenko, Domenico Giannone & Or Shachar, *Flight Liquidity*, FRBNY Staff Report No. 870 (March 2019), https://www.newyorkfed.org/medialibrary/media/research/staff_reports/sr870.pdf.

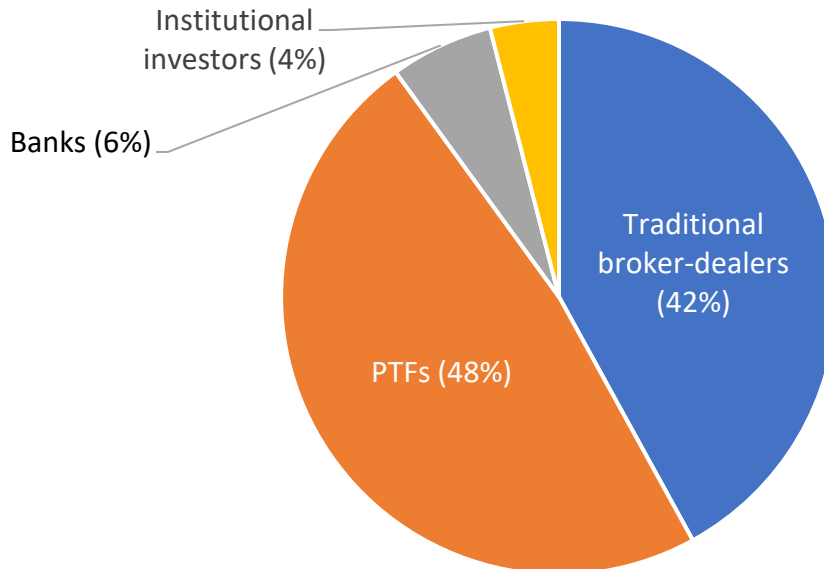
³⁵ The interdealer market accounted for a relatively larger share (54%) of trading in nominal coupon securities, which includes Treasury notes and bonds. FINRA, *Treasury Aggregate Statistics*, <https://www.finra.org/finra-data/treasury-weekly-aggregates>. See also Doug Brain et al., *Breaking Down TRACE Volumes Further*, FEDS Notes (Nov. 29, 2018), <https://www.federalreserve.gov/econres/notes/feds-notes/breaking-down-trace-volumes-further-20181129.htm> (between August 2017 and July 2018, the interdealer market accounted for 47% of trading volume in Treasury securities).

³⁶ James Collin Harkrader & Michael Puglia, *Principal Trading Firm Activity in Treasury Cash Markets*, FEDS Notes (Aug. 4, 2020), <https://www.federalreserve.gov/econres/notes/feds-notes/principal-trading-firm-activity-in-treasury-cash-markets-20200804.htm>.

³⁷ *Id.*

respectively, of trading in the interdealer market through most of 2019.³⁸ Banks affiliated with traditional broker-dealers account for approximately 6 percent of interdealer trading over the same period; institutional investors account for another 4 percent of trading in the interdealer market (see **Figure 3**).³⁹

Figure 3. Relative Share of Interdealer Market (2019)



Traditional Broker-Dealers and PTFs

Traditional broker-dealers execute trades with or on behalf of clients and are therefore required to register with the Securities and Exchange Commission (“SEC”) and become members of FINRA or a national securities exchange.⁴⁰ In practice, trading by traditional broker-dealers in the cash Treasury market is dominated by primary dealers designated as such by the Federal Reserve Bank of New York.⁴¹

PTFs typically trade for their own account, engage in a high volume of small trades, rarely carry inventory overnight, and typically use algorithmic and high-frequency trading strategies.⁴² Importantly, “PTF” is not a formal regulatory category—it is a description commonly used by regulators, such as the Treasury Department and the Federal Reserve, and other market observers

³⁸ *Id.* These data only cover trading volume in nominal coupon securities, which accounts for the majority of trading in the interdealer market.

³⁹ *Id.*

⁴⁰ Broker-dealers are required to note that they actively trade in U.S. Treasuries on their registration. 15 U.S. Code §§ 78o, 78o-5. See U.S. Securities and Exchange Commission (SEC), *Guide to Broker-Dealer Registration* (April 2008), <https://www.sec.gov/reportspubs/investor-publications/divisionsmarketregbdguidehtm.html>.

⁴¹ U.S. Department of Treasury (Treasury Department), *A Financial System That Creates Economic Opportunities: Capital Markets* 73 (Oct. 2017). For a current list of primary dealers, see FRBNY, *Primary Dealers*, <https://www.newyorkfed.org/markets/primarydealers>.

⁴² Treasury Department, *A Financial System That Creates Economic Opportunities* at 74 (cited in note 41).

to describe participants who fit these criteria.⁴³ Moreover, traditional broker-dealers also increasingly employ automated trading strategies typically associated with PTFs.⁴⁴ PTFs that hold themselves out as dealers are required to register with the SEC, even if they trade solely for their own account.⁴⁵ Accordingly, certain (but not all) market participants that are referred to as PTFs have registered with the SEC and become FINRA members.⁴⁶

Interdealer Trading Venues

Trading in the interdealer market can take place on automated electronic trading platforms that utilize central limit order books or on voice and manual electronic platforms.⁴⁷ Approximately 74% of trading in the interdealer market takes place on automated electronic trading venues.⁴⁸ **Table 1**, drawn from a Federal Reserve note on the interdealer market that provides the most recent publicly available data on trading volumes broken down by participant and venue, offers further detail regarding each type of participant’s share of trading volume on different platforms in the interdealer market in 2019.⁴⁹

Table 1. Participants Share of Trading Volumes on Interdealer Venues (2019)

	<i>Automated</i>	<i>Voice/Manual</i>
<i>Traditional Broker-Dealers and Affiliates⁵⁰</i>	38%	76%
<i>PTFs</i>	61%	12%
<i>Institutional Investors</i>	1%	13%

⁴³ *Id.*

⁴⁴ Treasury Department, Board of Governors of the Federal Reserve System, Federal Reserve Bank of New York, U.S. Securities and Exchange Commission, and U.S. Commodity Futures Trading Commission, *Joint Staff Report: The U.S. Treasury Market on October 15, 2014* 13 (July 2015), https://www.treasury.gov/press-center/press-releases/Documents/Joint_Staff_Report_Treasury_10-15-2015.pdf.

⁴⁵ SEC, *Guide to Broker-Dealer Registration* (cited in note 40).

⁴⁶ Doug Brain et al., *Unlocking the Treasury Market through TRACE*, FEDS Notes (Sep. 28, 2018), <https://www.federalreserve.gov/econres/notes/feds-notes/unlocking-the-treasury-market-through-trace-20180928.htm>. A list of FINRA member broker-dealers is available at FINRA, *Broker-Dealer Firms We Regulate*, <https://www.finra.org/about/firms-we-regulate/broker-dealer-firms-we-regulate>.

⁴⁷ Brain et al., *Unlocking the Treasury Market through TRACE* (cited in note 46).

⁴⁸ Harkrader & Puglia, *Principal Trading Firm Activity in Treasury Cash Markets* (cited in note 36)

⁴⁹ *Id.* These data only cover trading volume in nominal coupon securities, which accounts for the majority of trading in the interdealer market. Totals may exceed 100% due to rounding.

⁵⁰ This figure includes trades on interdealer platforms conducted by broker-dealers as well as their related global and domestic banking companies, across both FINRA and non-FINRA member entities.

Dealer-to-Client Market

The dealer-to-client market is where end users of Treasuries—such as institutional investors (e.g., mutual funds, hedge funds, pension funds and insurers), depository institutions, foreign central banks and sovereign wealth funds—transact with dealers.⁵¹

The dealer-to-client market is an over-the-counter market where trading has historically occurred on a bilateral basis through voice trading or via dealers’ proprietary trading platforms.⁵² However, electronic trading has also made inroads in the dealer-to-client segment of the Treasury market. The development of request-for-quote platforms has enabled clients to solicit bids and offers from different dealers electronically.⁵³ More recently, dealers and other market makers have started to provide clients with direct, continuous pricing streams that send prices and trade sizes at which they are willing to buy or sell a given Treasury security.⁵⁴

Importantly, unlike the interdealer market, there are not publicly available reports on the relative share of trading by specific types of market participants (e.g., hedge funds as compared to mutual funds) in the dealer-to-client market.

B. Trade Reporting Obligations

Part II B goes into further detail regarding the trade reporting obligations of participants in the Treasury market to FINRA’s TRACE database. FINRA’s TRACE database is not publicly available and although it offers regulators insight into the operation of the Treasury market, meaningful gaps remain even for regulators, particularly regarding the identities of Treasury end users.

Broker-Dealer Reporting Obligations

FINRA members, including traditional broker-dealers and PTFs, are required to report their trades in the cash Treasury market to FINRA’s TRACE database.⁵⁵ Such “trade reports” must include the time, size of the trade, and the identity of the reporting broker-dealer.⁵⁶ Each trade report has an individual identifier that allows FINRA to match two trade reports for the same trade and avoid double counting of trades when both parties must report their trade to FINRA (e.g., a

⁵¹ Treasury Department, *A Financial System That Creates Economic Opportunities* at 73 (cited in note 41)..

⁵² *Id.* at 74.

⁵³ *Id.*

⁵⁴ Kevin McPartland, *How Bilateral Streams for U.S. Treasuries Really Work*, Greenwich Associates (June 18, 2019), <https://www.greenwich.com/blog/how-bilateral-streams-us-treasuries-really-work>. See also Commissioner Elad L. Roisman, *Remarks at U.S. Treasury Market Conference* (Sep. 29, 2020), <https://www.sec.gov/news/speech/roisman-us-treasury-conference-2020-09-29>.

⁵⁵ FINRA Rule 6730(a)(4); FINRA, Reporting Transactions in U.S. Treasury Securities, Regulatory Notice 16-39 (Oct. 2016), https://www.finra.org/sites/default/files/notice_doc_file_ref/Regulatory-Notice-16-39.pdf. These reporting obligations do not apply to direct purchases from the Treasury Department as part of an auction.

⁵⁶ FINRA recently requested comment on potential enhancements to TRACE reporting requirements, including to the amount information required to be included in TRACE reports submitted by FINRA members. Those enhancements would include, among other things, requiring FINRA members to identify non-ATS electronic trading venues, such as request-for-quote platforms, through which they execute a trade. FINRA, *FINRA Requests Comment on Enhancements to TRACE Reporting for U.S. Treasury Securities*, Regulatory Notice 20-43 (Dec. 23, 2020).

transaction between two registered broker-dealers).⁵⁷ Subject to the exception described below for trading venues, FINRA members generally are **not** required to identify their counterparties in their trade reports.⁵⁸ If a broker-dealer’s counterparty is a banking entity, institutional investor or PTF that is not a FINRA member, then trade reports to FINRA’s TRACE database will not include the identity of the counterparty to the trade.

Reporting Obligations for Trading Venues

Additional reporting obligations apply to trading venues for cash Treasuries that execute more than \$10 billion in monthly trading volume for any two months in the preceding calendar quarter.⁵⁹ In practice, automated electronic platforms in the interdealer market generally exceed the \$10 billion threshold, while voice and manual trading venues do not.⁶⁰ These trading venue reporting requirements do not apply to the dealer-to-client market—including to trading platforms that use request-for-quote or streaming quote protocols, which are excluded based on the characteristics of those protocols.⁶¹

Trading venues that are subject to these additional reporting obligations are required to submit trade information to the FINRA TRACE database identifying both counterparties to a trade.⁶² Such trading venue reporting requirements therefore provide FINRA’s TRACE database with the identities of PTFs and institutional investors that are *not* FINRA members when they trade on interdealer automated electronic platforms.

Table 2 on the next page summarizes, based on the current reporting obligations for market participants in the Treasury market, whether the identity of a market participant would be included in reports to FINRA based on the type of participant and venue on which they trade. We note that the SEC has recently proposed applying Regulation ATS to certain trading venues for Treasuries, however the SEC’s proposal would not expand reporting obligations for market participants trading on those venues.⁶³ The Federal Reserve has also recently indicated that it intends to finalize 2016 plans to require banks to report their identities to the FINRA TRACE Database.⁶⁴ **Table 2** reflects how the Fed’s proposal would expand trade reporting for banking entities.

⁵⁷ FINRA Rule 6730(c).

⁵⁸ *Id.*

⁵⁹ This threshold is based on monthly trading volume by non-FINRA members. FINRA Rule 6730.07.

⁶⁰ Harkrader & Puglia, *Principal Trading Firm Activity in Treasury Cash Markets* (cited in note 36).

⁶¹ Roisman, *Remarks at U.S. Treasury Market Conference* (cited in note 54).

⁶² FINRA Rule 6730.07. See also FINRA, *ATS Reporting of Transactions in U.S. Treasury Securities*, Reg. Notice 18-34 (Oct. 4, 2018), https://www.finra.org/sites/default/files/notice_doc_file_ref/Regulatory-Notice-18-34.pdf.

⁶³ *Regulation ATS for ATSS that Trade U.S. Government Securities, NMS Stock, and Other Securities; Regulation SCI for ATSS that Trade U.S. Treasury Securities and Agency Securities; and Electronic Corporate Bond and Municipal Securities Markets*, Exchange Act Release No. 90019 (Sept. 28, 2020), <https://www.sec.gov/rules/proposed/2020/34-90019.pdf>. The proposal would require, among other things, government securities ATSS to report information about its order entry methods, available order types and execution protocols, trade error policies, segmentation of trading interest and counterparty restrictions, market data, the display of trading interest, and clearing and settling trades.

⁶⁴ Federal Reserve, *Proposed Agency Information Collection Activities; Comment Request, Board of Governors of the Federal Reserve System*, 86 Fed. Reg. 6329 (January 21, 2021); *Federal Reserve Board announces plans to enter negotiations with FINRA to potentially act as collection agent of U.S. Treasury securities secondary market transactions data* (Oct. 21, 2016), <https://www.federalreserve.gov/newsevents/pressreleases/other20161021a.htm>.

Table 2. Is a Participant's Identity Included in TRACE Reports?

	<i>Interdealer: Electronic Automated</i>	<i>Interdealer: Voice/Manual</i>	<i>Dealer-to-client</i>
<i>Traditional Broker-Dealer</i>	Yes	Yes	Yes
<i>PTF (FINRA member)</i>	Yes	Yes	Yes
<i>PTF (non-FINRA member)</i>	Yes	No	No
<i>Banking Entity</i>	Yes	No (Yes, if Fed proposal is finalized.)	No (Yes, if Fed proposal is finalized.)
<i>Institutional Investor</i>	Yes	No	No

Regulatory Gap in Trade Information

As demonstrated by **Table 2** and summarized in the prior section, FINRA’s TRACE database includes the identities of all market participants trading in cash Treasuries on the most liquid automated electronic trading venues. However, as further demonstrated by **Table 2**, neither the trade reporting obligations for broker-dealers nor the additional reporting obligations for certain trading venues provide regulators with information regarding the identity of PTFs that are not FINRA members, banking entities and investors that trade on manual interdealer platforms and in the dealer-to-client market. Such investors include mutual funds, hedge funds, pension funds, insurers, foreign central banks and sovereign wealth funds, among others. The lack of such information is a critical missing piece in understanding the volatility experienced in the cash Treasury market during March 2020.

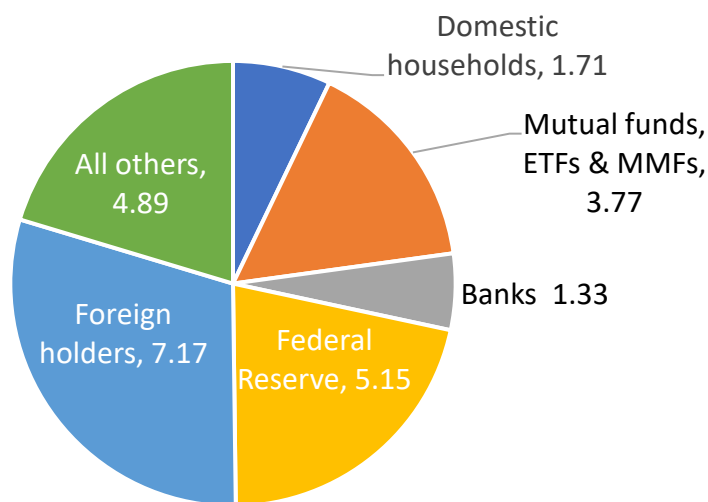
Part III: Publicly Available Data on Transactions and Holdings of U.S. Treasuries

Publicly available sources of Treasury holdings and trade data can be used to provide some insight into trading activity in the U.S. Treasury market in March 2020. These sources include: (1) Federal Reserve data on Treasury holdings; (2) Treasury Department data on foreign investor holdings and transactions in Treasuries; (3) Federal Reserve and Treasury Department data on holdings and transactions in U.S. Treasuries by foreign official investors; and (4) SEC data on Treasury holdings by mutual fund and money market funds. However, each of these data sources is subject to limitations that prevent them from being used to determine the source of selling in the U.S. Treasury market in March 2020.

Federal Reserve Data on Treasury Holdings

The Federal Reserve publishes quarterly data on Treasury holdings of various types of entities, including: the Federal Reserve, banks, mutual funds, money market funds, ETFs, domestic households and nonprofit organizations, and foreign holders.⁶⁵ **Figure 4** below illustrates the largest holders of U.S. Treasuries as of Q3 2020, the most recent quarter that is publicly available.⁶⁶

Figure 4. Major Holders of Treasury Securities, Q3 2020 (USD, trillions)⁶⁷



⁶⁵ Federal Reserve, *Financial Accounts of the United States*, L.210 Treasury Securities (Dec. 2020). These data are compiled from a variety of different sources. Foreign holdings of Treasury securities, for instance, are estimated based on data on international holdings of and transactions in Treasury securities released by the Bureau of Economic Analysis (BEA). Federal Reserve, *Financial Accounts Guide*, <https://www.federalreserve.gov/apps/fof/SeriesAnalyzer.aspx?s=FL263061120&t=>. That BEA data, in turn, is based on data collected by the Treasury Department as part of the Treasury International Capital (TIC) reporting system. BEA, *U.S. International Economic Accounts: Concepts and Methods* (Sep. 2014), <https://www.bea.gov/sites/default/files/methodologies/ONE%20PDF%20-%20IEA%20Concepts%20Methods.pdf>.

⁶⁶ Federal Reserve, *Financial Accounts of the United States*, L.210 Treasury Securities (Dec. 2020).

⁶⁷ The category of “All others” includes, among others, insurance companies, state and local governments, and pension funds. Federal Reserve, *Financial Accounts of the United States*, L.210 Treasury Securities (Dec. 2020).

Federal Reserve data demonstrate large reductions in holdings of Treasury securities among foreign investors (\$287 billion), open-end mutual funds (\$236 billion) and the domestic household and nonprofit sector (\$170 billion) from Q4 2019 to Q1 2020.⁶⁸

However, Federal Reserve data cannot be used to determine the source of selling during March 2020. First, the data are only updated on a quarterly basis. Accordingly, it is not possible to pinpoint selling that occurred in March, as opposed to January or February. Second, the Fed's holder categories are too vague to identify specific entity types. In the Fed's data, for example, foreign holders include foreign central banks, sovereign wealth funds, as well as non-U.S. mutual funds and hedge funds.⁶⁹

The Federal Reserve also publishes two supplemental quarterly datasets on the holdings of hedge funds, including their holdings of Treasury securities.⁷⁰ Since these data are only updated on a quarterly basis, they cannot be used to pinpoint selling in March 2020. The Fed's hedge fund data also have additional limitations. One dataset, which only includes domestic hedge funds, shows a decline in Treasury holdings of \$23.5 billion over Q1 2020.⁷¹ But many hedge funds that are active in the Treasury market are located offshore; data that exclude those funds may provide an inaccurate picture of hedge fund activity in the Treasury market.⁷² The other set of Federal Reserve data relies on SEC Form PF, so it covers both domestic and foreign hedge funds and would therefore seem to remedy concerns of excluding hedge funds located offshore.⁷³ SEC Form PF data show that hedge funds reduced their holdings of Treasury securities by approximately \$35 billion over the course of Q1 2020.⁷⁴ However, hedge funds do not report their exposure to cash Treasuries on Form PF; they only report their aggregate exposure to cash Treasuries *and* derivatives.⁷⁵ SEC Form PF data are therefore based on assumptions about the proportion of hedge funds' cash to derivatives exposure.⁷⁶ Inaccuracies in those assumptions would be reflected in the Fed's estimates.

⁶⁸ These figures are adjusted based on valuation changes. Annette Vissing-Jorgensen, *Bond markets in Spring 2020 and the response of the Federal Reserve* 7 (Jan. 3, 2021), http://faculty.haas.berkeley.edu/vissing/vissing_jorgensen_bonds2020.pdf.

⁶⁹ Federal Reserve, *Financial Accounts of the United States, Technical Q&As*, https://www.federalreserve.gov/releases/z1/z1_technical_qa.htm.

⁷⁰ Federal Reserve, *Financial Accounts of the United States*, Table B.101.f (Dec. 2020); Federal Reserve, *Hedge Funds*, <https://www.federalreserve.gov/releases/efa/efa-hedge-funds.htm>.

⁷¹ Federal Reserve, *Financial Accounts of the United States*, Table B.101.f (Dec. 2020).

⁷² Federal Reserve, *Financial Accounts of the United States, Technical Q&As* (cited in note 69).

⁷³ Federal Reserve, *Hedge Funds* (cited in note 70). Hedge funds must file Form PF if they have investment advisors that are required to register with the SEC, manage one or more private funds, and have at least \$150 million in private fund assets under management. Smaller hedge funds file Form PF annually while hedge funds with at least \$500 million in assets under management must file quarterly and report more detail on their assets and liabilities. *Id.* Foreign hedge funds whose investment advisors do not have a place of business in the United States, do not solicit U.S. investors and have minimal U.S. investment are not required to file Form PF.

⁷⁴ *Id.*

⁷⁵ Federal Reserve, *Financial Accounts of the United States, Technical Q&As* (cited in note 69).

⁷⁶ *Id.*

Treasury Department Data on Foreign Investor Holdings and Transactions in Treasuries

To further estimate trading in the U.S. Treasury market by foreign investors, Treasury Department reports are available that detail transactions in long-term Treasury securities (with an original maturity of one year or more) and holdings of Treasury securities (including short-term securities with maturity of less than one year) by residents of countries on a *monthly* basis.⁷⁷ The Treasury Department's holdings data show large reductions by residents of Saudi Arabia (\$25 billion), Brazil (\$21.5 billion) and the Euro Area (\$44 billion) over the course of March 2020.⁷⁸ The Treasury Department's transaction data also show large net sales of long-term Treasury securities by residents of the Cayman Islands (\$117.9 billion) and the United Kingdom (\$41.5 billion).⁷⁹

However, the Treasury Department holdings and transaction data does not identify the specific types of investors in each jurisdiction, so it cannot be used to draw definitive conclusions as to the trading behavior by specific types of investors. Furthermore, even monthly data can obscure changes in Treasury holdings that occurred over the course of March. For example, certain foreign central banks may have sold Treasury securities in early March in order to satisfy the U.S.-dollar liquidity needs of local banks and businesses, and then bought Treasuries after the Federal Reserve expanded dollar liquidity swap lines in late March.⁸⁰ Foreign central banks could therefore have played a larger role in the selling in early March 2020 than would be suggested by end-of-March data.

The Treasury data also suffer from serious methodological issues.⁸¹ First, the transaction data only records transactions between foreign investors and U.S. residents; foreign-to-foreign transactions are not included.⁸² For example, the Treasury Department's transaction data would not capture a sale of Treasuries by a foreign investor in Hong Kong to a foreign investor in the U.K. The Treasury transaction data therefore undercounts the trading activity of foreign investors.

The Treasury's monthly transaction data *and* the Treasury's monthly holdings data also do not provide reliable information on the *location* of the end-investors that are actually driving the purchase or sale of Treasuries. That is because the monthly transaction data are recorded based on the country of the broker-dealer acting as an intermediary, not the country of the ultimate buyer or

⁷⁷ U.S. Department of the Treasury (Treasury Department), *Treasury International Capital (TIC) System*, <https://home.treasury.gov/data/treasury-international-capital-tic-system>. The TIC reporting system consists of a related set of monthly, quarterly, annual, and benchmark surveys conducted by the Federal Reserve Bank of New York (FRBNY) acting as the fiscal agent for the Treasury Department; the FRBNY has the legal authority to collect the survey data and publish the resulting statistics. Cf. Vissing-Jorgensen, *Bond markets in Spring 2020 and the response of the Federal Reserve* at 25 (cited in note 68).

⁷⁸ Treasury Department, *Major Foreign Holders of Treasury Securities*, <https://ticdata.treasury.gov/Publish/mfh.txt>.

⁷⁹ Treasury Department, *U.S. Transactions with Foreigners in Long-term Domestic and Foreign Securities, by Type and Country*, https://ticdata.treasury.gov/Publish/sl_globl.txt.

⁸⁰ Federal Reserve, *Central Bank Liquidity Swaps* (July 2020), <https://www.federalreserve.gov/monetarypolicy/central-bank-liquidity-swaps.htm>.

⁸¹ Carol C. Bertaut & Ruth Judson, *Estimating U.S. Cross-Border Securities Positions: New Data and New Methods*, Board of Governors of the Federal Reserve System, International Finance Discussion Papers 1113 (Aug. 2014), <https://www.federalreserve.gov/pubs/ifdp/2014/1113/ifdp1113.pdf>.

⁸² *Id.* at 7–8.

seller of the security.⁸³ For example, when a German resident sells a Treasury bond through a London broker-dealer, the Treasury Department will record it as a sale from the U.K. rather than Germany.⁸⁴ Similarly, the Treasury Department's holdings data are based on the location of the custodian of assets, rather than the country of the end-owner of the Treasuries.⁸⁵ For example, when a Russian investor uses a custodian in Switzerland to hold Treasuries, those holdings will be reported as held by a resident of Switzerland.⁸⁶ The Treasury Department's holdings and transactions data therefore do not provide reliable data on trading or holdings by the actual owners of Treasuries.

Federal Reserve and Treasury Department Data on Foreign Official Institutions

The Treasury Department and Federal Reserve provide Treasury holdings and transaction data specific to foreign official institutions, such as foreign central banks.

The Treasury Department provides monthly holdings and transaction data for foreign official institutions, including foreign central banks, sovereign wealth funds and government agencies,⁸⁷ but such holdings and transaction data are provided on an *aggregate* basis across all jurisdictions (not divided by jurisdiction or by type of foreign official institution). The holdings data show that holdings of Treasury securities by foreign official institutions declined by \$147 billion over the course of March 2020.⁸⁸ Transactions data, on the other hand, show net sales of \$61 billion of long-term Treasury securities over the same period.⁸⁹ Differences between the Treasury Department's holdings and transactions data for foreign official institutions are likely due to the same methodological issues described in the prior subsection.

The Federal Reserve reports, on a weekly basis, Treasury securities held in custody at the Federal Reserve Bank of New York for foreign governments and central banks, as well as international organizations including the International Monetary Fund and Bank for International Settlements.⁹⁰ As with the Treasury Department data for foreign official institutions, the Federal Reserve weekly custody data is provided on an aggregate basis for all foreign official institutions and does not provide a further breakdown by jurisdiction or by type of foreign official institution.⁹¹

⁸³ *Id.* at 8–9

⁸⁴ *Id.*

⁸⁵ *Id.* at 9–10

⁸⁶ *Id.*

⁸⁷ For a list of foreign institutions classified as official for these purposes, see Treasury Department, *Partial List of Foreign Institutions classified as Official for purposes of Reporting on the TIC Forms* (Aug. 2014), <https://ticdata.treasury.gov/Publish/foi-aug2014.html>.

⁸⁸ Treasury Department, *Major Foreign Holders of Treasury Securities*, <https://ticdata.treasury.gov/Publish/mfh.txt>.

⁸⁹ Treasury Department, *U.S. Transactions with Foreigners in Long-term Domestic and Foreign Securities, by Type and Country*, https://ticdata.treasury.gov/Publish/sl_globl.txt.

⁹⁰ Federal Reserve, *Factors Affecting Reserve Balances – H.4.1*, Table 1A, <https://www.federalreserve.gov/releases/h41/current/>; Federal Reserve Bank of New York, *Central Bank & International Account Services*, <https://www.newyorkfed.org/markets/central-bank-and-international-account-services>. See also Treasury Department, *Foreign Official Institutions' Holdings of U.S.-issued and/or Dollar-denominated Financial Assets – Differences among Alternative Data Sources* (Sep. 17, 2004), <https://ticdata.treasury.gov/Publish/fohdefs1.904.pdf>.

⁹¹ *Id.*

The Federal Reserve’s weekly data show that custodial holdings of Treasury securities by the Fed for foreign official institutions declined by \$149 billion between February 26, 2020 and April 1, 2020.⁹² Notably, nearly \$42 billion of that decline was between March 11 and March 18—when Treasury yields were spiking.⁹³ However, the Federal Reserve weekly custody data is not comprehensive as to the holdings of foreign official institutions, because not all foreign official institutions hold their Treasury securities in custody at the Federal Reserve Bank of New York.⁹⁴ For example, Federal Reserve weekly custody data show that as of the end of March 2020, foreign official holdings of Treasuries held in custody at the Federal Reserve Bank of New York were \$2.855 trillion whereas Treasury Department monthly holdings data show that foreign official holdings of Treasuries were \$4.118 trillion.⁹⁵

Although the Federal Reserve and Treasury Department data can provide some useful insight into changes in the aggregate holdings of foreign official institutions through March 2020, such holdings data cannot provide further understanding as to the jurisdictions or the type of foreign official institution that reduced their holdings over that period.

SEC Data on Mutual Fund Holdings

Mutual funds are required by SEC regulation to publicly disclose their holdings on a quarterly basis.⁹⁶ These publicly available filings can be used to determine the changes in Treasury holdings by mutual funds over Q1 2020. Vissing-Jorgensen (2021) estimates that mutual funds sold approximately \$132 billion in Treasuries in Q1 2020.⁹⁷ However, as noted earlier in Part III, quarterly data makes it impossible to pinpoint selling that occurred in March, as opposed to January or February.

Money market funds (“MMFs”) are required by the SEC to publicly disclose their holdings on a monthly basis.⁹⁸ Investment Company Institute data indicate that MMFs were net purchasers of Treasury securities over the course of March 2020 (\$308 billion).⁹⁹ However, as noted

⁹² Federal Reserve, *Memorandum Items: Custody Holdings: Marketable U.S. Treasury Securities: Wednesday Level*, Federal Reserve Bank of St. Louis, <https://fred.stlouisfed.org/series/WMTSECL1>.

⁹³ *Id.*

⁹⁴ Treasury Department, *Frequently Asked Questions Regarding the TIC System and TIC Data*, Questions 10a, 10b, <https://home.treasury.gov/data/treasury-international-capital-tic-system-home-page/frequently-asked-questions-regarding/ticfaq2>. There are other significant differences between the two sources, including with respect to valuation (Fed holdings are reported at face value, while Treasury data based on estimated market value) and timing (Fed data are reported as of each Wednesday, Treasury data as of the end of each month). *Id.*

⁹⁵ Federal Reserve, *Factors Affecting Reserve Balances – H.4.1*, Table 1A (April 2, 2020), <https://www.federalreserve.gov/releases/h41/20200402/>; Treasury Department, *Major Foreign Holders of Treasury Securities*, <https://ticdata.treasury.gov/Publish/mfh.txt>.

⁹⁶ SEC, *Amendments to the Timing Requirements for Filing Reports on Form N–Port*, 84 Fed. Reg. 7980 (March 6, 2019).

⁹⁷ Vissing-Jorgensen, *Bond markets in Spring 2020 and the response of the Federal Reserve* at 12 (cited in note 68) (CRSP data). See also Yiming Ma, Kairong Xiao & Yao Zeng, *Mutual Fund Liquidity Transformation and Reverse Flight to Liquidity* (July 1, 2020), <https://ssrn.com/abstract=3640861>; Shiyang Huang et al., *Does Liquidity Management Induce Fragility in Treasury Prices? Evidence from Bond Mutual Funds* (Nov. 2020), <https://ssrn.com/abstract=3689674>.

⁹⁸ SEC, *Money Market Fund Reform*, 75 Fed. Reg. 10060, 10081 (March 4, 2010).

⁹⁹ Investment Company Institute, *Monthly Taxable Money Market Fund Portfolio Summary, March 2020* (April 16, 2020), <https://ici.org/research/stats/mmfsummary/archive>.

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throughout Part III, monthly data can fail to capture changes in trading activity that occurred over the course of the month. In particular, on March 23 the Federal Reserve launched the Money Market Mutual Fund Liquidity Facility (“MMLF”)¹⁰⁰ and inflows to MMFs increased following its implementation.¹⁰¹ Accordingly, a portion of Treasury purchases by MMFs in March 2020 may have occurred after the Treasury market had already been stabilized by Fed purchases.

Publicly available holdings and transaction data for U.S. Treasury securities therefore do not provide sufficiently specific information regarding trading activity in the Treasury market by end investors in March 2020 to reach definitive conclusions regarding the source of selling pressure.

¹⁰⁰ Federal Reserve, *Money Market Mutual Fund Liquidity Facility* (Feb. 9, 2021), <https://www.federalreserve.gov/monetarypolicy/mmlf.htm>.

¹⁰¹ Federal Reserve, *Factors Affecting Reserve Balances – H.4.1* (Apr. 2, 2020), <https://www.federalreserve.gov/releases/h41/20200402/>; Dian Rabouin, *Professional Investors Keep Loading Up on Cash*, Axios (Apr. 24, 2020), <https://www.axios.com/money-market-funds-professional-investors-coronavirus-708a795f-cbc8-4116-a513-1093c216130e.html>.

Conclusion

In Part I, we reviewed the unexpected rise in U.S. Treasury yields during the severe equity market selloff in March 2020. We also described the illiquidity in the U.S. Treasury market and successful intervention by the Federal Reserve to stabilize the market. In Part II, we then described the market structure for cash Treasuries, including the interdealer market and dealer-to-client market. We then reviewed the reporting obligations for market participants and transaction data available to policymakers from FINRA's TRACE database. Finally, in Part III, we comprehensively described publicly available holdings and transaction data for U.S. Treasuries, including data provided by the Federal Reserve, Treasury Department and SEC.

We conclude that regulators and the public do not have access to sufficient information to comprehensively determine the source of selling that caused the spike in Treasury yields in March 2020. We therefore caution policymakers against enacting policies in response to March 2020 without the necessary information to ensure that such policies are well-targeted. An appropriate first step for policymakers may be to consider whether additional reporting obligations are warranted beyond recent steps taken by the Federal Reserve and FINRA. We also recommend that regulators continue to study the U.S. Treasury market to determine whether reforms, beyond expanded reporting, are necessary to make the market more efficient, resilient and transparent.

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