Internet Appendix
"U.S. Banks and Global Liquidity"

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A   FR 2052a and FR Y9-C Comparison

This comparison between the LCR assessment data and the FR Y-9C data serves two important functions. First, it verifies that the daily balance sheet snapshots assembled from the liquidity monitoring reports are of high quality and broadly match the public filings reported on quarter-ends. Second, the comparison highlights an advantage of the LCR monitoring data for assessing the gross amount of intermediation in dollar liquidity. As the FR Y-9C data defers to Generally Accepted Accounting Principles (GAAP) standards in the netting treatment of certain balance sheet items, matched-book exposures in repurchase agreements (repos) are significantly lower as reported in this form. For instance, the gross exposure in repo borrowing aggregated across the six GSIBs is around $1.8 trillion at the end of 2018 according to the LCR data, but only around $800 billion according to the FR Y-9C. The former more accurately reflect the volume of repo intermediation from other sources.[1]

Figure A1 shows that repo are reverse repo positions are significantly larger in FR2052a than in Y-9C. The net reverse repo positions from the two sources have similar trends. The other main asset and liability items from the two sources are broadly in line with each other.

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[1]Daily triparty repo volume was around $2.2 trillion and GCF repo was around $700 billion at the end of 2018, according to the Federal Reserve Bank of New York. Additionally, sizable bilateral repo borrowings also make up a large part of the banks' repo exposure.

B   Intraday rate movements during the September 2019 event

This section describes the intraday movements in several rates during the September 16 and 17 event shown in Figure 11.

Even though the GC repo rate spiked to its high on Tuesday September 17, the repo market was already experiencing significant strains on Monday after the TGA balance increase. The morning of Monday, September 16th started with elevated but orderly secured funding rates. Both GC repo and FX implied dollar rate were trading around 2.5%, which is around 20 basis points higher than the previous trading day's close and 40 basis points higher than the interest on reserve. The bid-ask spread in FX swapped dollar funding was also relatively tight. The GC repo rate increased steadily throughout the day peaking around 4.5% (mid) by late afternoon, when the market closed for the day. The timing of the repo rate increase in late morning and early afternoon suggests that auction settlement-related financing is likely a driver of the repo rate increase.[2]

The elevated secured funding rates carried over to Tuesday from the day before. Despite the lack of additional Treasury settlement or tax payment on Tuesday (the TGA balance only increased by $8 billion on Tuesday), the GC repo borrowing rate quickly increased to a high of 10% by early-morning, when the bulk of the repo volume occurs, and the FX-implied funding rate reacted in lock step. Shortly after 9 a.m, the Federal Reserve Bank of New York announced that it would conduct repo operations and ultimately lent $53 billion to primary dealers in overnight repo. The secured funding rates declined sharply thereafter.

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[2]Since the repo market starts trading early in the morning, a large fraction of trades were done before 9 a.m., around this time, $78 of new treasury issuance was settled through the Bank of New York Mellon (BNYM) (Since 2017, BNYM has been the sole provider of U.S. government securities settlement and triparty repo services for broker-dealers.). Primary dealers typically draw down or overdraft their clearing accounts at BNYM to fund the treasury settlement, and, over the course of the day, these dealers sell the new bonds in exchange for cash to "refill" their clearing account by 3:30 pm (Pozsar, 2019). A fraction of the newly issued treasury bonds were sold off to real-money investors, and the remaining portion of the new issuance were bought by levered investors or remained in dealer's inventory, both of which required repo financing.

C   Dealer security financing needs

In this section, we present suggestive evidence that dealers' own security financing needs also contributed to the September 2019 liquidity crunch in addition to the breakdown of reserve-based intermediation.

Decomposing the balance sheet shifts by subsidiary, we find that the decline in reserves in depository institutions coincided with an increase in repo borrowing by the broker-dealer affiliates to finance the holdings of Treasury securities. Dealer accumulation of Treasury securities is likely related to reduced demand from real money institutions at Treasury auctions as the Treasury yield curve flattened and inverted throughout this period. Figure A9 shows that these broker-dealer reached their highest level of external repo financing (net reverse repo reached their lowest level) immediately prior to the repo rate spike. This financing need coincided with an increase in primary dealers' accumulation of coupon securities throughout 2018 and early 2019, as shown in Figure A10.[3]

Two additional trends that are typically associated with funding strains also emerged around the same time. First, broker-dealer were increasingly reliant on worse collaterals to finance their borrowings. Panel A in Figure A11 shows that broker-dealers have historically net lend out cash against Treasurys collateral, but net borrowed cash against non-Treasury collaterals. In 2019, broker-dealers reduced the net lending collateralized by Treasurys and increased the reliance on funding using non-Treasurys as collateral. An increasing fraction of the borrowing were backed by equities and Government Sponsored Enterprise (GSE) bonds. Second, dealers became more engaged in maturity transformation in 2019. Panel B in Figure A11 shows that while dealers continue to net lend the same amount of termed repo with maturity greater than one-week, they have started to borrow with short maturity repo contracts. Dealers became net borrowers of short-maturity repo, as opposed to net lender in earlier period.

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[3]Primary dealers shown in Figure A10 include dealers beside those affiliated with the six GSIBs.

The maturity and collateral mismatch observed in 2019 bear resemblance to the hall-marks of broker-dealer's repo financing just prior to the financial crisis. The key difference is that this time, the funding pressure arises from the need to finance Treasury securities, rather than illiquid securities.

D FX swap exposure in the bank trading book

Figure A12 plots the foreign currency funding gap for the four major currencies, and our estimated FX swap exposure in the bank's trading book based on information included in the FR Y-14 data. We can observe that a positive foreign currency funding gap in euros, yen and sterling is indeed matched by a short position in the foreign currency and a long position in dollars in the FX swap market. Since the FR Y-14 data only capture FX swap exposure in the trading book, it is not surprising that these exposures are lower than the overall foreign currency funding gap. In the case of the euro, the correlation between the overall euro funding gap and the estimated short-euro-long-dollar FX swap position in the trading book is about 70%.

Figure A1: Comparison of FR 2052a and FR Y-9C
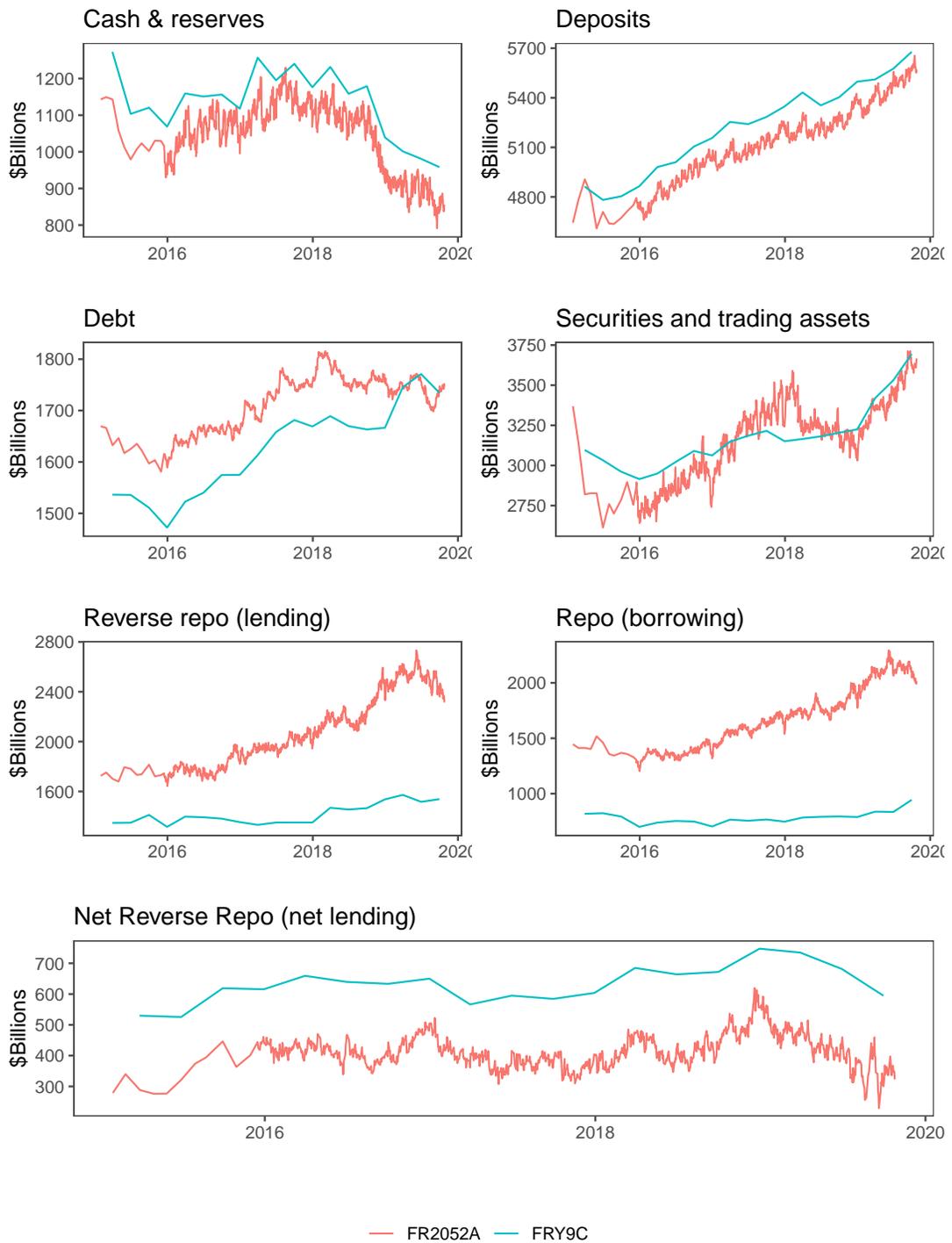
Notes: This figure provides a comparison between the balance sheet items constructed from various inflow and outflow product categories in FR 2052a and the reported balance sheet items in FR Y9-C.

Figure A2: Fluctuations in the Treasury General Account Balance
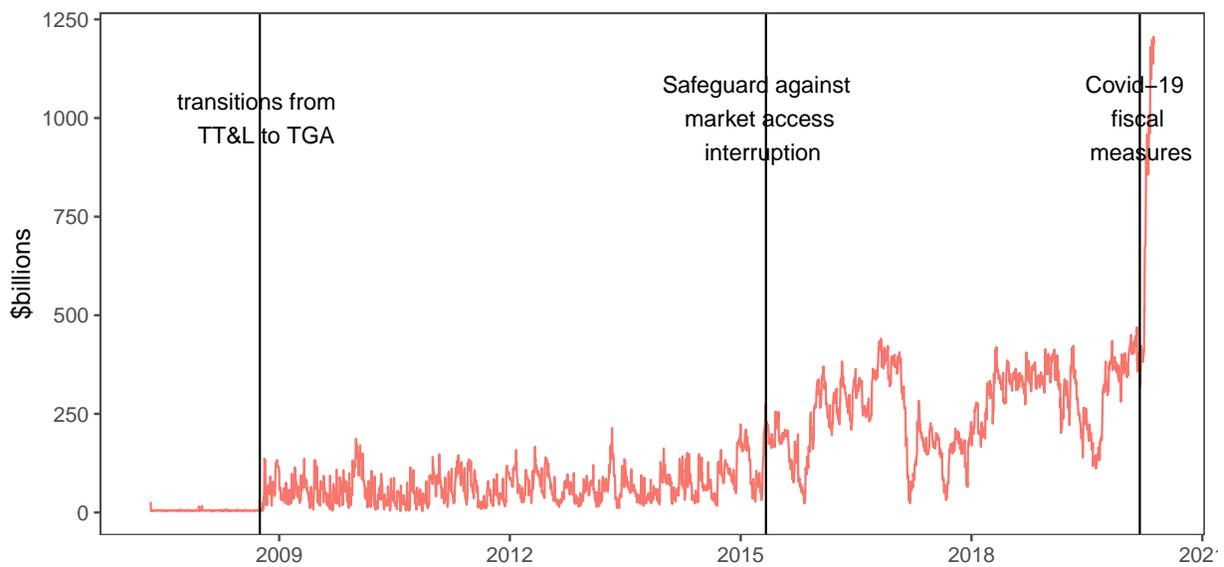
Notes: This figure shows time series of the Treasury General Account (TGA) balance. Prior to 2009, the U.S. Treasury they held most of its balances in commercial banks through the Treasury Tax and Loan Program. In May 2015, the Treasury expanded its TGA balance to protect against a potential interruption in market access. In March 2020, Increased fiscal spending relating to the COVID-19 pandemic further prompted large increase in the TGA account.

Figure A3: Period-end short-term intermediation spreads
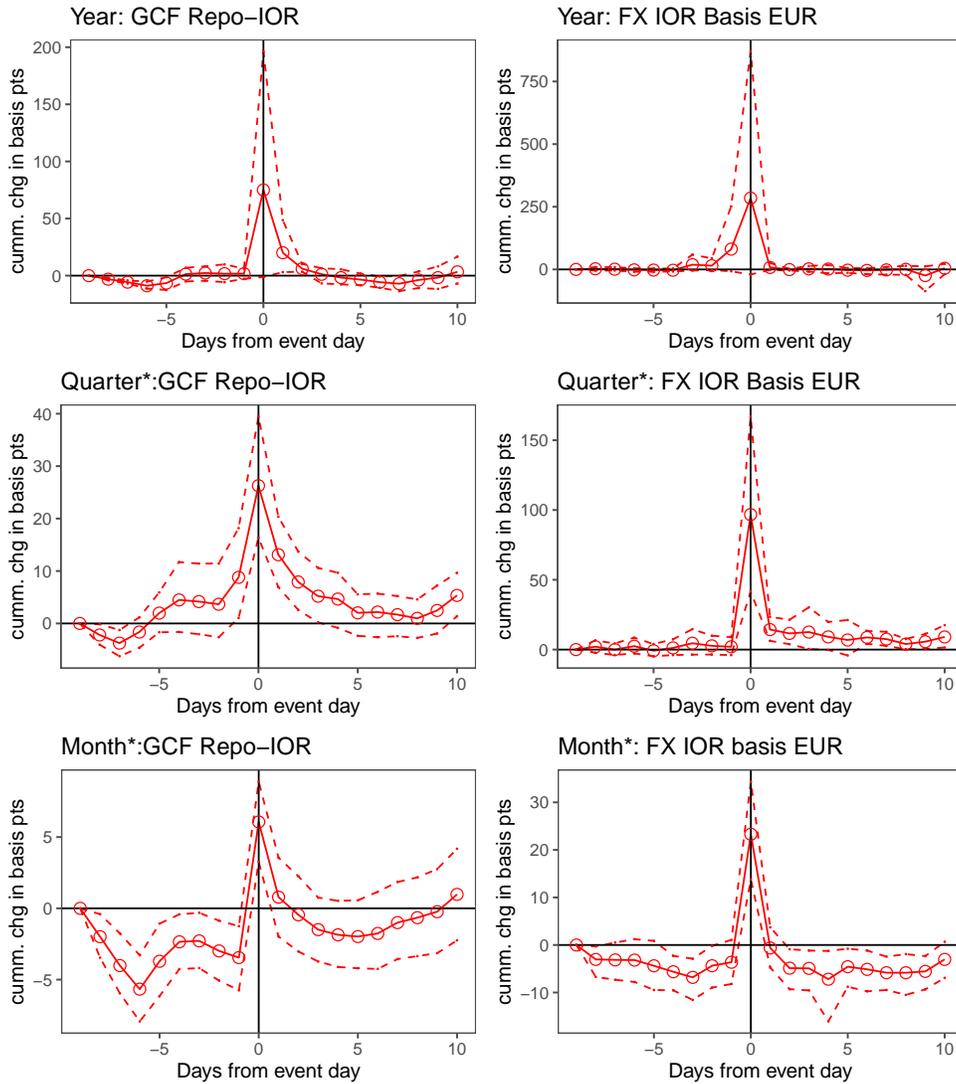
Notes: This figure shows the period-end effects on short-term funding spreads. The left column shows the spread between the GCF repo rate and the interest on reserve (IOR) at the Federal Reserve. The right column shows the EUR overnight FX IOR basis, measured as the spread of the implied dollar funding rate by swapping the ECB deposit rate minus the Fed IOR. The sample period is from December 2015 to September 2019. Quarter-ends refer to quarter-ends that are not year-ends. Month-ends refer to month-ends that are not quarter-ends. The dotted lines denote the 95% confidence interval with bootstrapped standard errors.

Figure A4: U.S. GSIBs' liquidity provision around year-ends
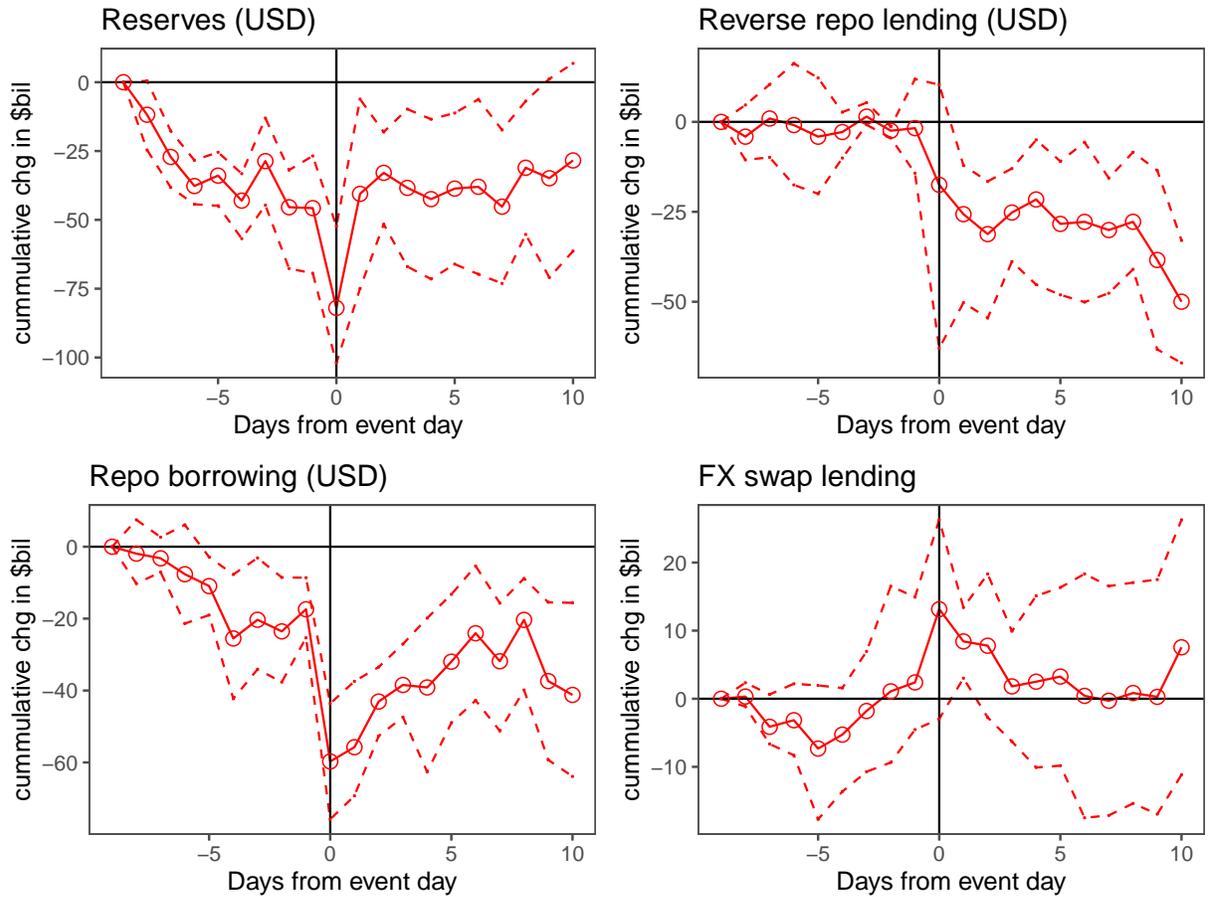
Notes: This figure shows year-end changes in U.S. GSIBs' dollar reserves, reverse repo lending, repo borrowing, and FX swap lending. The discussions of these liquidity measures are provided in Section 3. The dotted lines denote the 95% confidence interval with bootstrapped standard errors.

Figure A5: U.S. GSIBs' liquidity provision around month-ends
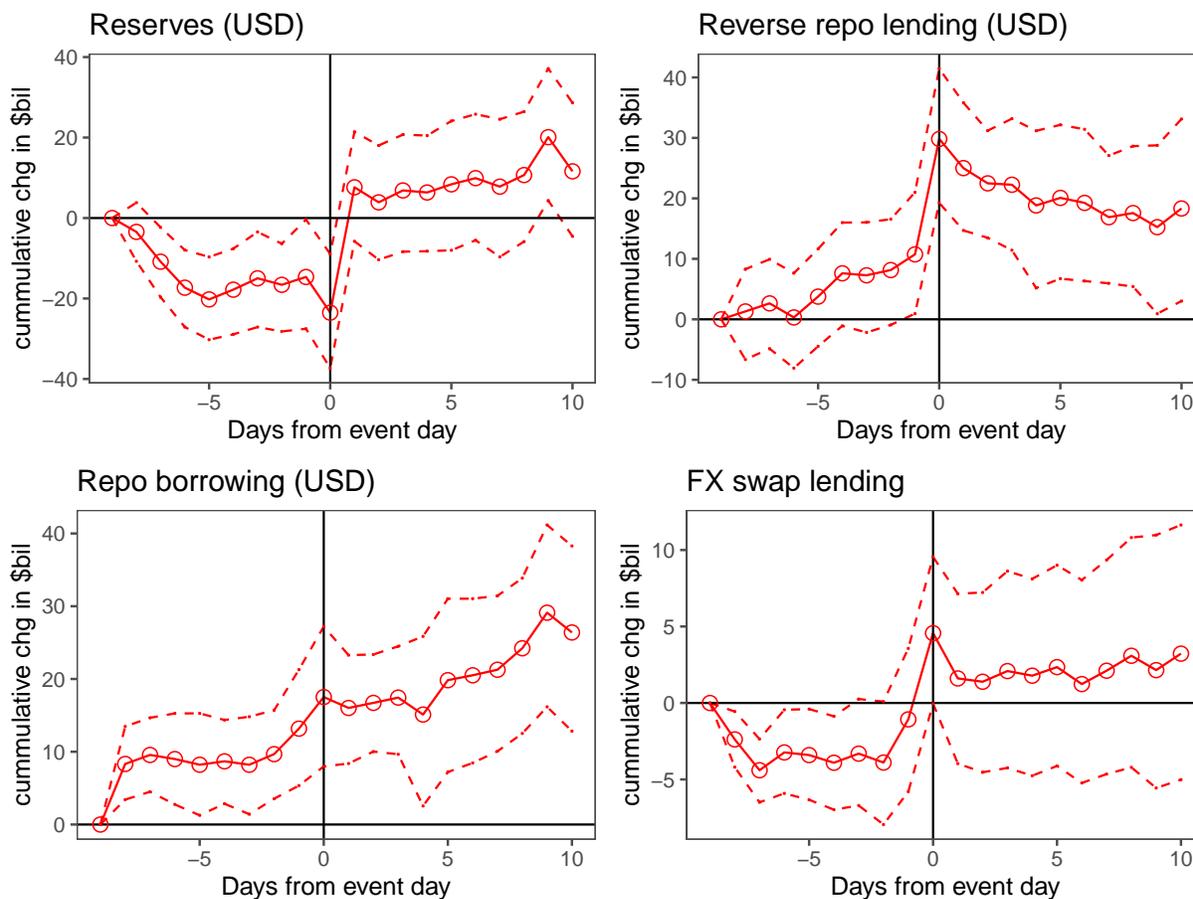
Notes: This figure shows month-end changes in U.S. GSIBs' dollar reserves, reverse repo lending, repo borrowing, and FX swap lending. The discussions of these liquidity measures are provided in Section 3. Month-ends are defined as month-ends that do not coincide quarter-ends.The dotted lines denote the 95% confidence interval with bootstrapped standard errors.

Figure A6: Foreign banks' liquidity provision around quarter-ends
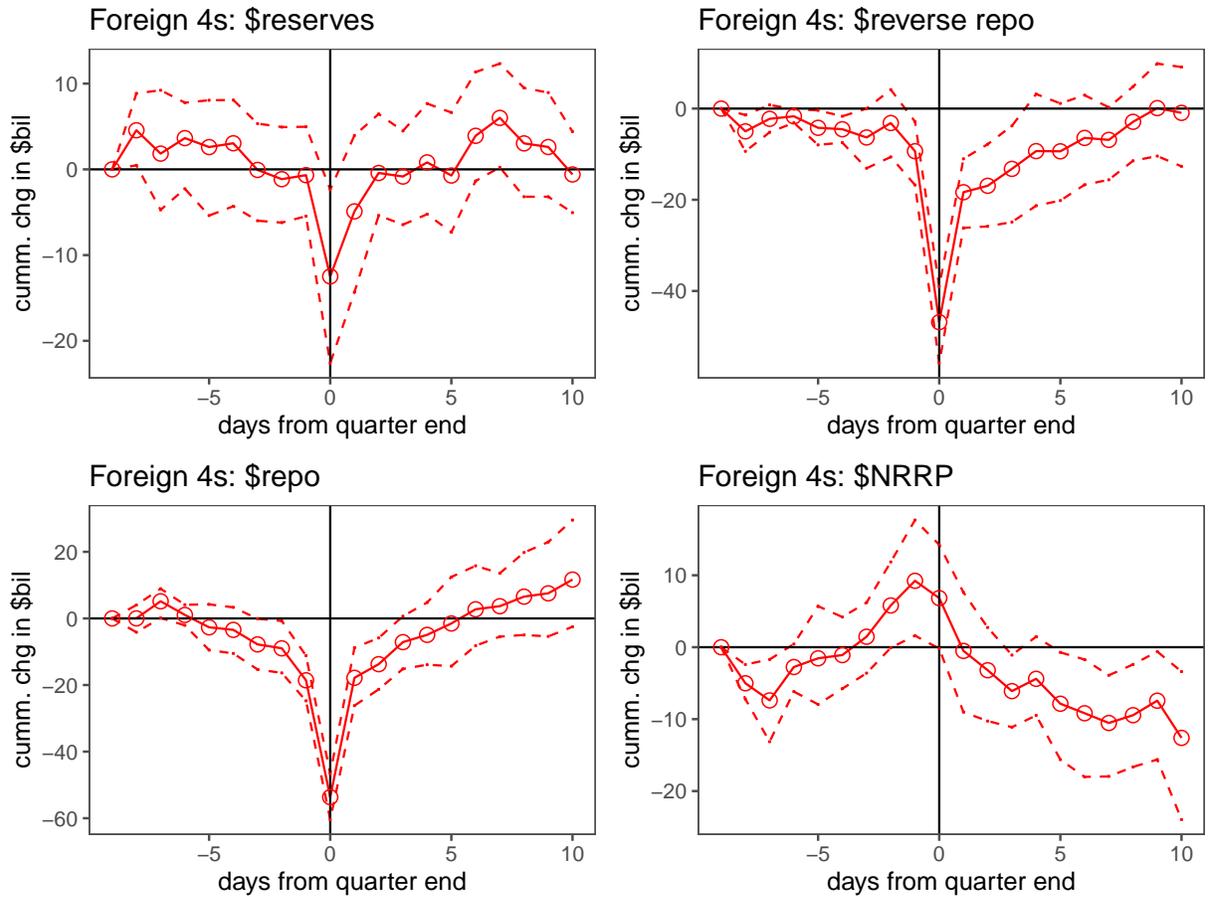
Notes: This figure shows quarter-end changes in foreign banks' dollar reserves, reverse repo lending, repo borrowing, and net reverse repo lending. The positions are aggregated across four foreign banking offices in the U.S. with daily reporting requirements for FR2052a. The discussions of these liquidity measures are provided in Section 3. The dotted lines denote the 95% confidence interval with bootstrapped standard errors.

Figure A7: Evolution of the Federal Reserve Balance Sheet Post-GFC
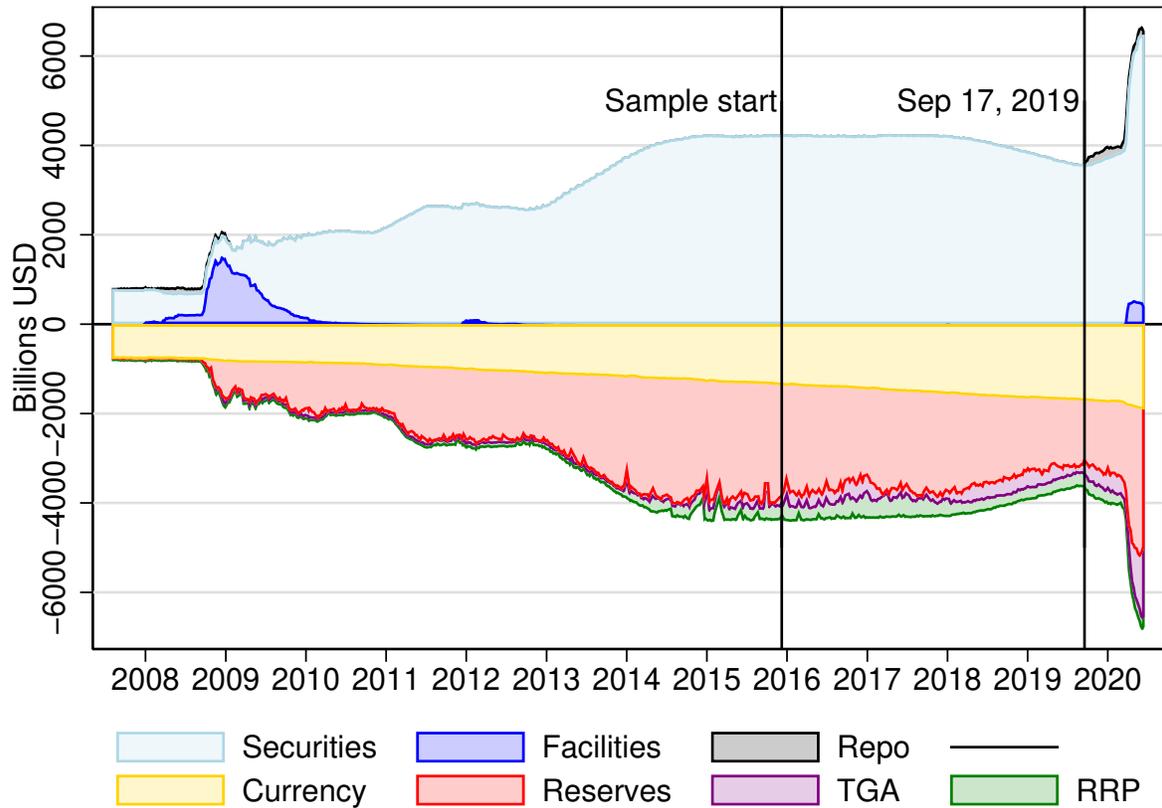
Notes: This figure plots major assets and liability items of the Federal Reserve post-GFC. "Securities" refers to outright securities holdings, "Facilities" denotes liquidity facility, including central bank swap lines; "Repo" denotes the repo facility; "Currency" denotes currency in circulation; "Reserves" denotes total bank reserves; "TGA" denotes the Treasury general account; and "RRP" denotes the reverse repo facility.

Figure A8: Dollar Funding Spreads Since September 2019
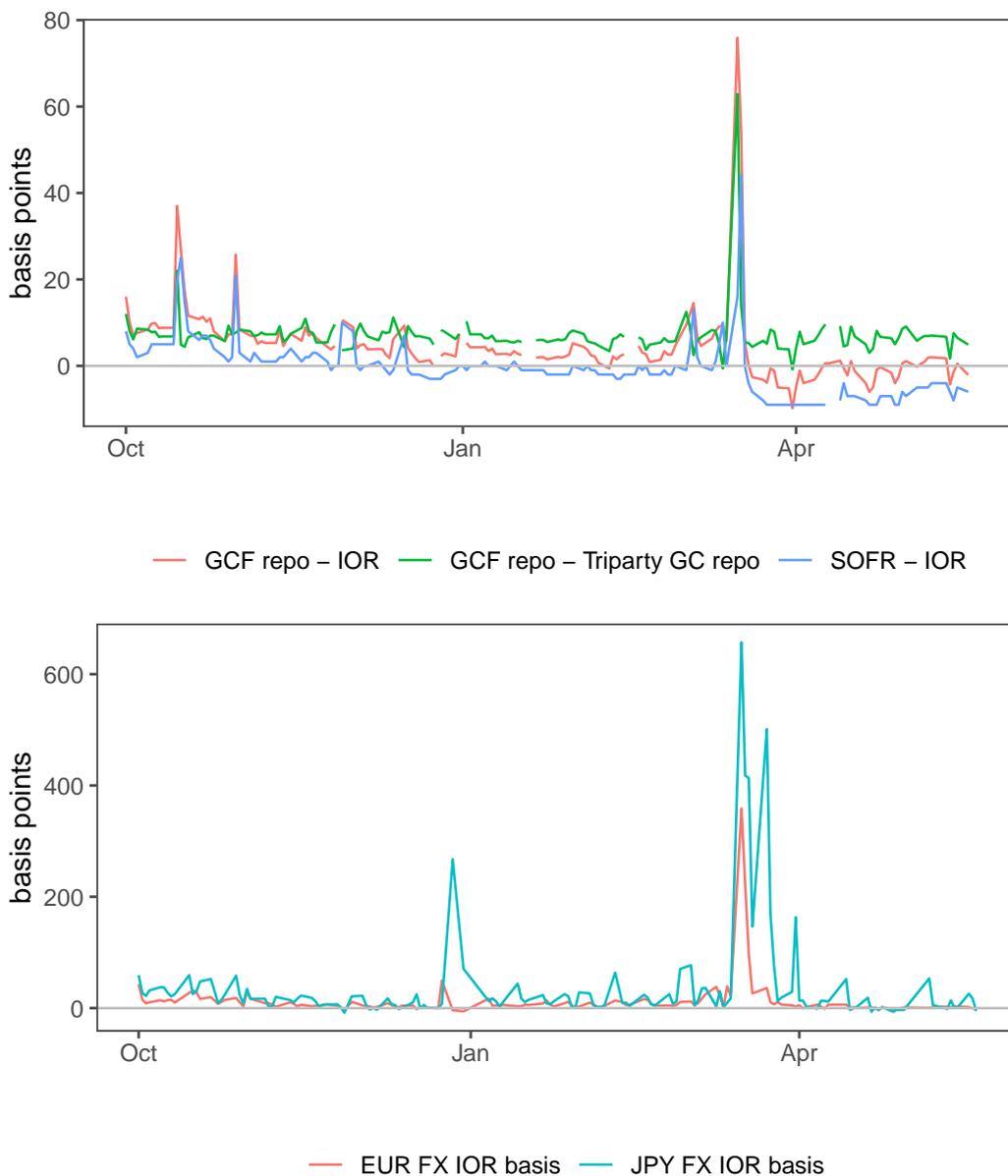
Notes: This figure shows the funding spreads since post the repo rate spike in September 2019. In the top panel, we plot the spread between the GCF general collateral Treasury repo rate and interest on excess reserve (IOR) at the Federal Reserve ("GCF repo-IOR"), the spread between the GCF and Triparty Treasury general collateral repo spread ("GCF Repo - Triparty GC Repo Spread"), and the spreaad between the Secured Overnight Financing Rate (SOFR) and the IOR ("SOFR-IOR"). In the bottom panel, we plot the spread of the implied dollar funding rate by swapping the ECB deposit rate over the Fed IOR ("EUR FX IOR basis"), and the spread of the implied dollar funding rate by swapping the BOJ deposit rate over the Fed IOR ("JPY FX IOR basis").

Figure A9: Broker-dealer dollar net reverse repo
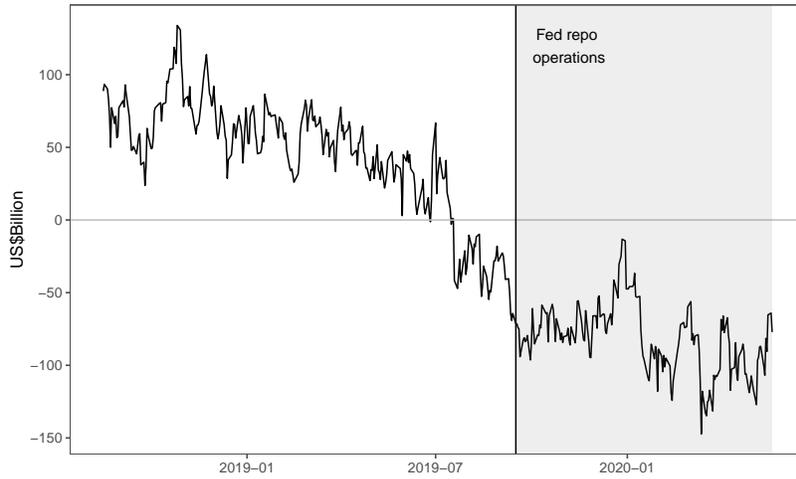
Notes: This figure shows the net reverse repo position (reverse repos minus repos) denominated in dollars for the broker-dealer entities of U.S. GSIBs in our sample. The shaded area denotes the period since the Fed introduced the repo facility on September 17, 2019.

Figure A10: Prime dealers treasury holdings

Notes: This figure shows the net Treasury holdings for all prime dealers (including primary dealers within our sample U.S. GSIBs and all other primary dealers). The data is from weekly public release of FR 2004 filings.

Figure A11: Broker-dealer dollar net reverse repo by collateral and maturity

(A) Collateral breakdown

(B) Maturity breakdown:
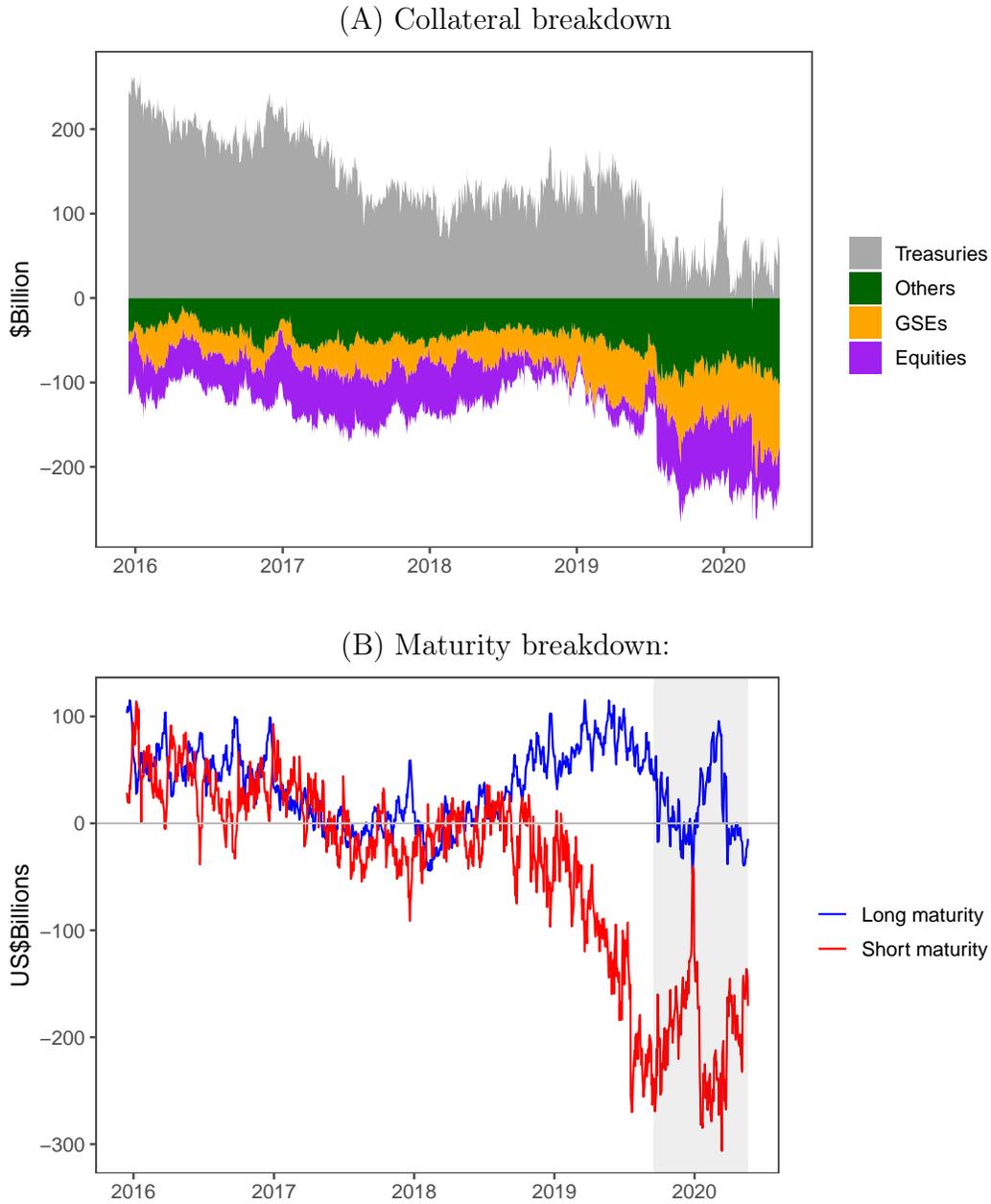
Notes: Panel (A) shows collateral breakdown of the net reverse repo position for the broker-dealer entities of the U.S. GSIBs. For a given collateral type, a positive number indicates that the broker-dealers are lending more than borrowing against the collateral. Panel (B) shows the maturity breakdown of the net reverse repo position for the broker-dealer entities of the U.S. GSIBs. Long-maturity refers to contracts with maturity greater than one week, and short-maturity refers to contracts with maturities of one week or less.

Figure A12: U.S. GSIBs funding gaps by currency and FX swaps
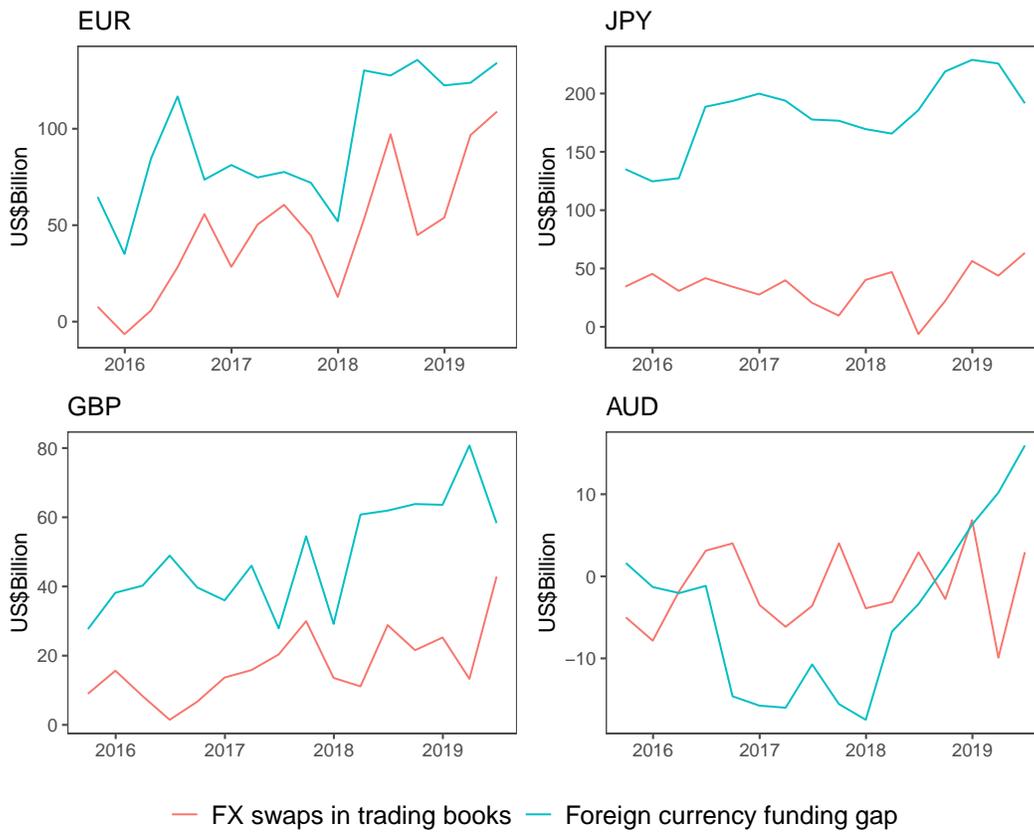
Notes: This figures shows the quarterly foreign currency funding gap as the difference between foreign currency assets and liabilities for U.S. GSIBs in blue based on the FR 2052a data for the EUR, JPY, GBP and AUD. The red line shows and the estimated FX swap exposure that goes long in dollars and short in the respective foreign currency from the Y14 data.

Table A1: Impacts of Quarter-Ends, TGA, and SOMA Fluctuations on Intermediation Spreads: Post September 2019

	Dependent variable:					
	$\Delta SOFR - IOR$	$\Delta GCF - IOR$	$\Delta TGCR - IOR$	$\Delta GCF - TGCR$	$\Delta EURIOR$	$\Delta JPYIOR$
	(1)	(2)	(3)	(4)	(5)	(6)
$Qstart_t$	−14.300	−12.400	−0.172	4.870***	−1.440	−29.400
	(12.500)	(13.700)	(0.131)	(1.360)	(9.460)	(42.500)
$Qend_t$	−1.650	−3.680	−0.001	−3.600	6.690	138.000**
	(1.970)	(6.380)	(0.029)	(3.790)	(21.700)	(58.500)
ΔTGA_t	0.045***	0.086**	0.0004**	0.046	0.223	0.533
	(0.017)	(0.036)	(0.0002)	(0.028)	(0.177)	(0.367)
$\Delta SOMA_t$	−0.010	−0.027	−0.0001	−0.023	−0.141	−0.955*
	(0.036)	(0.042)	(0.0004)	(0.032)	(0.148)	(0.526)
Constant	−0.213	−0.241	−0.002	−0.035	0.512	6.600
	(0.435)	(0.482)	(0.005)	(0.311)	(1.250)	(5.090)
N	155	157	155	155	150	134
R^2	0.153	0.154	0.180	0.055	0.051	0.110

Notes: This table shows the post-September 2019 regression results of the quarter-end dummies, TGA and SOMA fluctuations on daily changes in various intermediation spreads. The dependent variables are as follows: daily changes in the SOFR–IOR spread (Column 1), daily changes in the GCF repo–IOR spread (Column 2), daily changes in the Triparty (TGCR) repo–IOR spread (Column 3), daily changes in the GCF–TGCR repo spread (Column 4), daily changes spread between the overnight implied dollar rate by swapping the ECB deposit rate and the Fed IOR (Column 5), and daily changes in the spread between the overnight implied dollar rate by swapping the BOJ deposit rate and the Fed IOR (Column 6). The independent variables are as follows: $Qend_t$, a dummy variable indicating the last business day of the quarter; $Qstart_t$ a dummy variable indicating the first business day of the quarter; ΔTGA, daily changes in the TGA balance; $\Delta SOMA$, daily changes in the Fed portfolio holdings of Treasury securities. The sample period is from October 1, 2019 to May 18, 2020. Robust standard errors are reported in the parentheses with significance levels denoted by *p<0.1; **p<0.05; ***p<0.01.

Table A2: Impact of Quarter-Ends, TGA, and SOMA Fluctuations on Intermediation Activities: Post September 2019

	Dependent variable:						
	ΔRSV_t	ΔRRP_t	ΔRP_t	$\Delta NRRP_t$	ΔFX_t	$\Delta Deposit_t$	$\Delta TSY_t^{outright}$
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
$Qend_t$	−43.700***	−10.900	−29.200***	18.300	8.600***	−40.000***	−5.210
	(12.100)	(33.800)	(6.430)	(27.800)	(2.430)	(4.800)	(6.270)
$Qstart_t$	49.000***	−28.700	−24.500***	−4.270	−6.510	16.500	10.500*
	(8.500)	(21.300)	(7.370)	(18.100)	(6.060)	(14.400)	(5.820)
ΔTGA_t	−0.293***	0.109**	0.010	0.100**	0.070***	−0.053	0.035
	(0.075)	(0.045)	(0.032)	(0.048)	(0.022)	(0.078)	(0.026)
$\Delta SOMA_t$	0.511***	−0.190**	−0.105**	−0.085	−0.019	0.305***	−0.068
	(0.131)	(0.078)	(0.051)	(0.069)	(0.044)	(0.111)	(0.043)
Constant	−0.191	1.770	1.350	0.421	0.029	2.990	0.788
	(2.230)	(1.700)	(1.400)	(1.690)	(0.851)	(2.040)	(0.710)
N	157	157	157	157	157	157	157
R^2	0.301	0.123	0.123	0.060	0.101	0.101	0.061

Notes: This table shows the post-Septmeber 2019 regression results of one-day changes in the TGA account (ΔTGA_t), net SOMA purchase ($\Delta SOMA_t$), and quarter-end ($Qend_t$) and quarter-starts ($Qstart_t$) on daily changes in the U.S. GSIBs intermediation activities. The dependent variables are as follows: changes in reserves (Column 1), changes in dollar reverse repos (Column 2), changes in dollar repos (Column 3), changes in net dollar reverse repos, or the difference between reverse repos and repos in dollars (Column 4), changes in dollar lending in the FX swap market (Column 5), changes in dollar deposits (Column 6), and changes in outright Treasury holdings (Column 7). $Qend_t$ is a dummy variable indicating the last business day of the quarter, and $Qstart_t$ is a dummy variable indicating the first business day of the quarter. The sample period is from October 1, 2019 to May 18, 2020. Robust standard errors are reported in parentheses with significance levels denoted by *p<0.1; **p<0.05; ***p<0.01.

Table A3: Comparisons of FX Lending Measures

	*Dependent variable:*					
	ΔFX_t	ΔFX_t^{all}	ΔFX_t	ΔFX_t^{all}	ΔFX_t	ΔFX_t^{all}
	(1)	(2)	(3)	(4)	(5)	(6)
ΔTGA_t	0.040***	0.030**	0.031***	0.021*		
	(0.013)	(0.012)	(0.012)	(0.012)		
ΔTGA_t^{Other}					0.045***	0.029**
					(0.015)	(0.014)
$\Delta TSY_t^{Issuance}$					0.004	0.007
					(0.018)	(0.019)
$\Delta SOMA_t$			−0.178	−0.197*	−0.217*	−0.217*
			(0.116)	(0.113)	(0.118)	(0.115)
$Qend_t$			10.600***	8.480***	11.400***	8.900***
			(3.150)	(2.360)	(3.170)	(2.420)
$Qstart_t$			−8.420**	−8.640***	−8.270**	−8.560***
			(3.270)	(2.700)	(3.290)	(2.710)
Constant	0.191	0.181	0.082	0.103	0.188	0.157
	(0.238)	(0.242)	(0.229)	(0.239)	(0.233)	(0.239)
N	932	932	932	932	932	932
R^2	0.012	0.007	0.067	0.049	0.070	0.050

Notes: This table shows regression results of one-day changes in the TGA account (ΔTGA_t), net SOMA purchase ($\Delta SOMA_t$), and quarter-end ($Qend_t$) and quarter-starts ($Qstart_t$) on daily changes in two measures of dollar lending in the FX swap market. The benchmark measure ΔFX_t is defined by Equation 1. The alternative measure ΔFX_t^{all} is defined by Equation 2. Column 5 and 6 shows additional breakdown of TGA into changes in net Treasury issuance (ΔTSY_t^{Issue}) and other components of TGA(ΔTGA_t^{Other}). Robust standard errors are reported in parentheses with significance levels denoted by *p<0.1; **p<0.05; ***p<0.01.

Table A4: Impacts of Quarter-Ends, Different Components of TGA, and SOMA Fluctuations on Intermediation Spreads

	(1) $\Delta SOFR - IOR$	(2) $\Delta GCF - IOR$	(3) $\Delta TGCR - IOR$	(4) $\Delta GCF - \Delta TGCR$	(4) $\Delta EUR\ IOR$	(5) $\Delta JPY\ IOR$
$Qend_t$	11.20***	29.19**	7.112***	22.05*	146.7**	424.8***
	(2.720)	(14.21)	(2.707)	(12.01)	(60.27)	(118.2)
$Qstart_t$	-11.22***	-32.03**	-6.524**	-25.52*	-166.3*	-284.7***
	(3.674)	(13.16)	(2.580)	(14.35)	(85.24)	(98.02)
ΔTGA_t^{Other}	0.0255**	0.0506*	0.0229**	0.0276	0.404***	0.544***
	(0.0102)	(0.0259)	(0.00976)	(0.0215)	(0.0927)	(0.208)
ΔTSY_t^{Issue}	0.0859***	0.111***	0.0687***	0.0424**	-0.0218	0.158
	(0.0106)	(0.0203)	(0.00949)	(0.0166)	(0.0719)	(0.145)
$\Delta SOMA_t$	-0.523***	-1.456**	-0.436***	-1.019*	-3.348**	1.338
	(0.152)	(0.688)	(0.160)	(0.612)	(1.523)	(2.391)
Constant	-0.391***	-0.738***	-0.313***	-0.415***	0.643	-1.052
	(0.119)	(0.195)	(0.0988)	(0.159)	(0.651)	(2.094)
N	933	930	933	930	901	835
R^2	0.311	0.288	0.242	0.198	0.255	0.378

Notes: This table shows the regression results of the quarter-end dummies, different components of TGA fluctuations, SOMA fluctuations on daily changes in various intermediation spreads. The dependent variables are as follows: daily changes in the SOFR–IOR spread (Column 1), daily changes in the GCF repo–IOR spread (Column 2), daily changes in the Triparty (TGCR) repo–IOR spread (Column 3), daily changes in the GCF–TGCR repo spread (Column 4), daily changes spread between the overnight implied dollar rate by swapping the ECB deposit rate and the Fed IOR (Column 5), and daily changes in the spread between the overnight implied dollar rate by swapping the BOJ deposit rate and the Fed IOR (Column 6). The independent variables are as follows: $Qend_t$, a dummy variable indicating the last business day of the quarter; $Qstart_t$ a dummy variable indicating the first business day of the quarter; ΔTGA_t^{Other}, daily changes in TGA balance unrelated to net Treasury issuance; (ΔTSY_t^{Issue}), net treasury issuance; and $\Delta SOMA$, daily changes in the Fed portfolio holdings of Treasury securities. Robust standard errors are reported in parentheses with significance levels denoted by *p<0.1; **p<0.05; ***p<0.01.

Table A5: Impacts of Quarter-Ends, Different Components of TGA, and SOMA Fluctuations on Intermediation Activities

	Dependent variable:						
	ΔRSV_t	ΔRRP_t	ΔRP_t	$\Delta NRRP_t$	ΔFX_t	$\Delta Deposit_t$	$\Delta TSY_t^{outright}$
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
ΔTGA_t^{Other}	−0.232***	−0.127***	−0.116***	−0.011	0.045***	−0.128***	0.071***
	(0.045)	(0.029)	(0.027)	(0.027)	(0.015)	(0.045)	(0.012)
ΔTSY_t^{Issue}	−0.087*	0.118***	−0.008	0.126***	0.004	0.139***	0.039***
	(0.053)	(0.040)	(0.033)	(0.037)	(0.018)	(0.046)	(0.014)
$\Delta SOMA_t$	0.627**	−0.926***	−0.258	−0.667***	−0.217*	−0.647***	−0.120**
	(0.308)	(0.284)	(0.256)	(0.240)	(0.118)	(0.220)	(0.060)
$Qend_t$	−29.100***	−11.400	−31.700***	20.300***	11.400***	−3.440	3.850
	(7.470)	(7.180)	(4.960)	(5.130)	(3.170)	(4.260)	(2.870)
$Qstart_t$	41.500***	−7.690	0.515	−8.200**	−8.270**	28.900***	−0.626
	(5.450)	(5.110)	(4.170)	(4.150)	(3.290)	(4.410)	(1.500)
Constant	−0.848	−0.673	0.279	−0.952**	0.188	−0.874	0.182
	(0.628)	(0.480)	(0.421)	(0.408)	(0.233)	(0.647)	(0.207)
N	932	932	932	932	932	932	932
R^2	0.148	0.074	0.111	0.098	0.070	0.096	0.048

Notes: This table shows regression results of one-day changes in the TGA account unrelated to net Treasury issuance (ΔTGA_t^{Other}), net treasury issuance (ΔTSY_t^{Issue}), net SOMA purchase ($\Delta SOMA_t$) on daily changes in the U.S. GSIBs intermediation activities. The dependent variables are as follows: changes in reserves (Column 1), changes in dollar reverse repos (Column 2), changes in dollar repos (Column 3), changes in net dollar reverse repos, or the difference between reverse repos and repos in dollars (Column 4), changes in dollar lending in the FX swap market (Column 5), changes in dollar deposits (Column 6), and changes in outright Treasury holdings (Column 7). $Qend_t$ is a dummy variable indicating the last business day of the quarter, and $Qstart_t$ is a dummy variable indicating the first business day of the quarter. Robust standard errors are reported in parentheses with significance levels denoted by *p<0.1; **p<0.05; ***p<0.01.

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Table A6: Comparisons of Outright versus Repo-financed Treasury Holdings

	Dependent variable:		
	ΔTSY_t^{all}	$\Delta TSY_t^{outright}$	$\Delta TSY_t^{fin.}$
	(1)	(2)	(3)
ΔTGA_t^{Other}	0.063***	0.071***	−0.007
	(0.013)	(0.012)	(0.009)
ΔTSY_t^{Issue}	0.071***	0.039***	0.032**
	(0.016)	(0.014)	(0.012)
$\Delta SOMA_t$	−0.306***	−0.120**	−0.186**
	(0.095)	(0.060)	(0.085)
$Qend_t$	−0.612	3.850	−4.470**
	(2.940)	(2.870)	(1.900)
$Qstart_t$	−1.480	−0.626	−0.852
	(1.800)	(1.500)	(1.420)
Constant	0.159	0.182	−0.023
	(0.223)	(0.207)	(0.149)
N	932	932	932
R^2	0.052	0.048	0.034

Notes: This table shows regression results of one-day changes in the TGA account unrelated to net Treasury issuance (ΔTGA_t^{Other}), net treasury issuance (ΔTSY_t^{Issue}), net SOMA purchase ($\Delta SOMA_t$), and quarter-end dummies on daily changes in Treasury holding-related positions. The dependent variables are as follows: ΔTSY_t^{All}, daily changes in total Treasury holdings of U.S. GSIBs, including outright holdings and repo-financed Treasury holdings (Column 1); $\Delta TSY_t^{outright}$, daily changes in outright Treasury holdings (Column 2); and ΔTSY_t^{fin}, daily changes in repo-financed Treasury holdings (Column 3). $Qend_t$, is a dummy variable indicating the last business day of the quarter, and $Qstart_t$ is a dummy variable indicating the first business day of the quarter. Robust standard errors are reported in parentheses with significance levels denoted by *p<0.1; **p<0.05; ***p<0.01.