Resilience redux in the US Treasury market

Presentation exhibits

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Abstract

The resilience of the US Treasury market is limited by dealer balance sheets that are not sufficiently large and flexible to effectively intermediate this market in a "dash for cash," as when COVID became a global pandemic in March 2020. Since 2007, the total size of primary dealer balance sheets per dollar of Treasuries outstanding has shrunk by a factor of nearly four. This trend continues because of large US fiscal deficits and regulatory capital constraints, which are necessary for financial stability but reduce the flexibility of dealer balance sheets. I review approaches for increasing the intermediation capacity of the market and for backstopping Treasury market liquidity with official-sector market-function purchase programs.

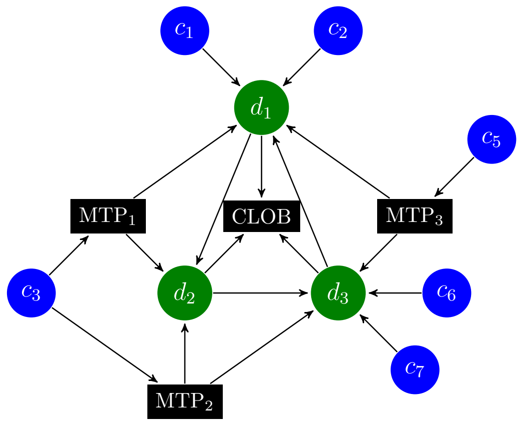


Figure 1: A schematic of the structure of the secondary market for trading US Treasury securities. Blue dots represent investors. Green dots represent dealers. Black rectangles represent trading venues. The Brokertec central limit order book (CLOB) market is in practice used only for on-the-run securities and only by dealers and a small selection of high frequency trading firms. Multilateral trade platforms (MTPs) are arranged by firms such as Bloomberg and Tradeweb.

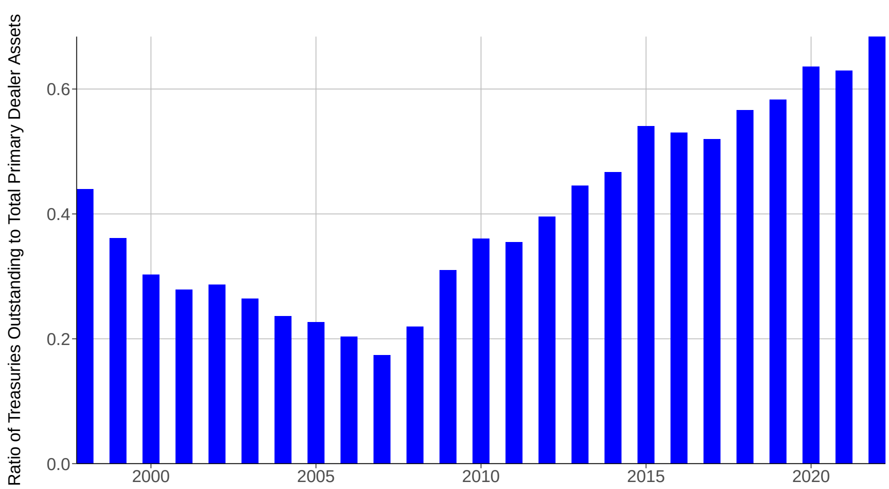


Figure 2: The ratio of US Treasury securities outstanding to primary dealer assets over the period 1998-2022. Data: The Federal Reserve and company filings. Assets are measured at the holding company level.

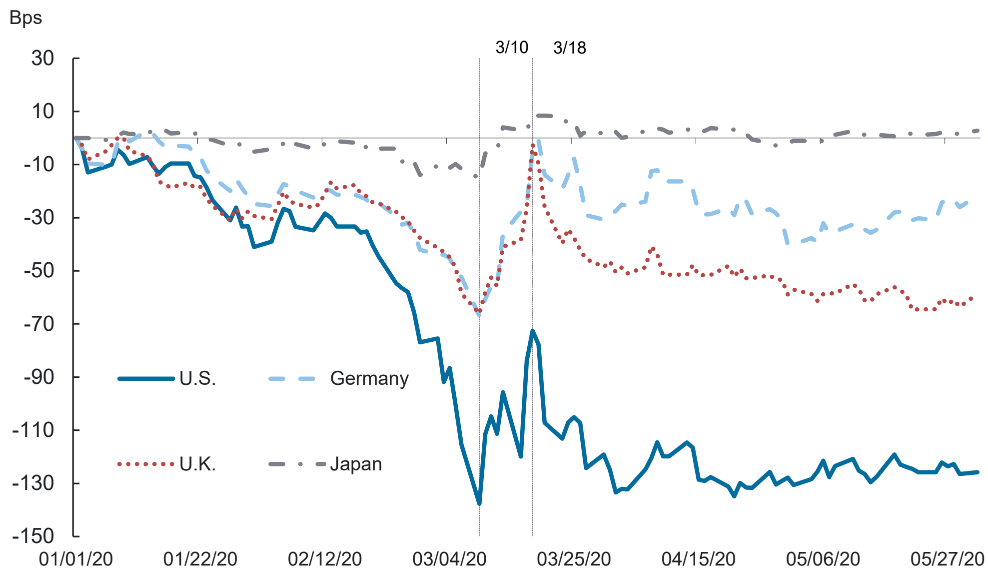


Figure 3: Cumulative changes in 10-year government securities yields, in basis points, from January 1, 2020 to May 30, 2020, for Germany, Japan, the United Kingdom, and the United States. Source: Barone, Chaboud, Copeland, Kavoussi, Keane, and Searls (2022).

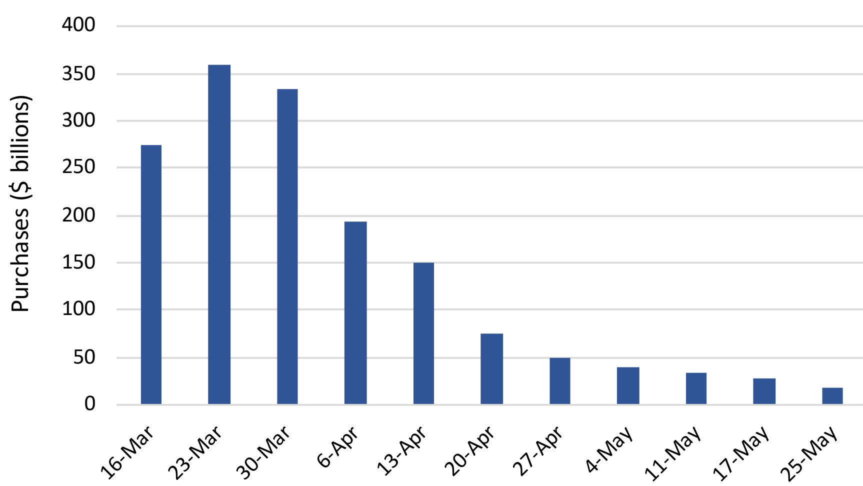


Figure 4: Total weekly purchases of Treasuries by the Fed in the weeks of March 16 through May 25, 2020. Data: Federal Reserve. Source: Duffie (2020).

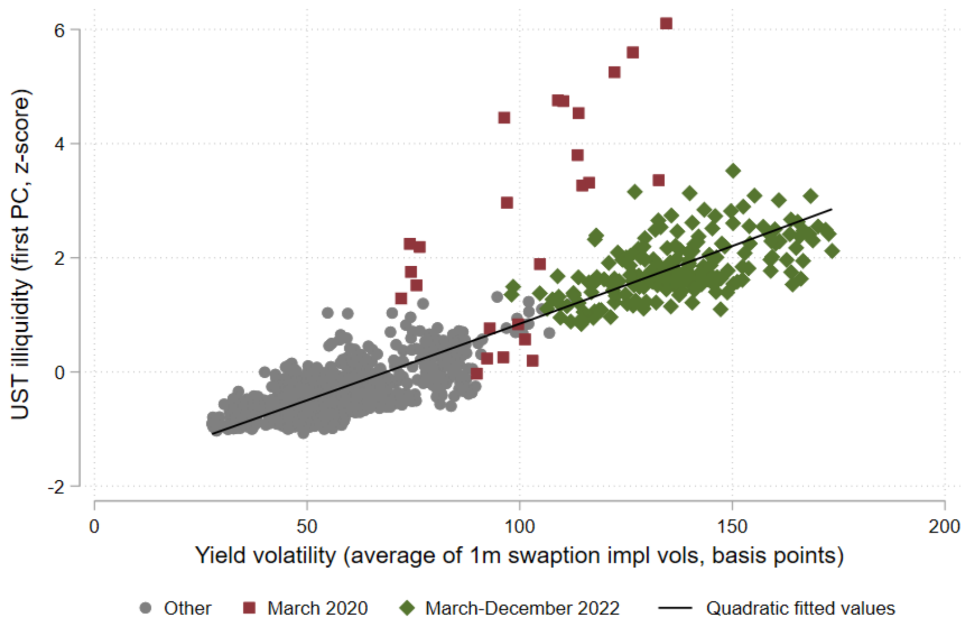


Figure 5: A scatter plot and estimated relationship between the principal-component composite measure of Treasury market illiquidity and the volatility of US yields (the average of the standard deviations of swap rates, in basis points, implied by swaptions on 2-year, 5-year, and 10-year swaps with one-month expirations). The plotted ordinary-least-squares fit, for July 10, 2017 to December 31, 2022 (1,336 daily observations), is the second-order polynomial $y = -1.81 + 0.026x + 0.000005x^2$, where x is yield volatility in basis points. The constant and linear coefficient estimates have p-values of less than 1% under standard assumptions. $R^2 = 79.5\%$. Source: Duffie, Fleming, Keane, Nelson, Shachar, and Van Tassel (2023).

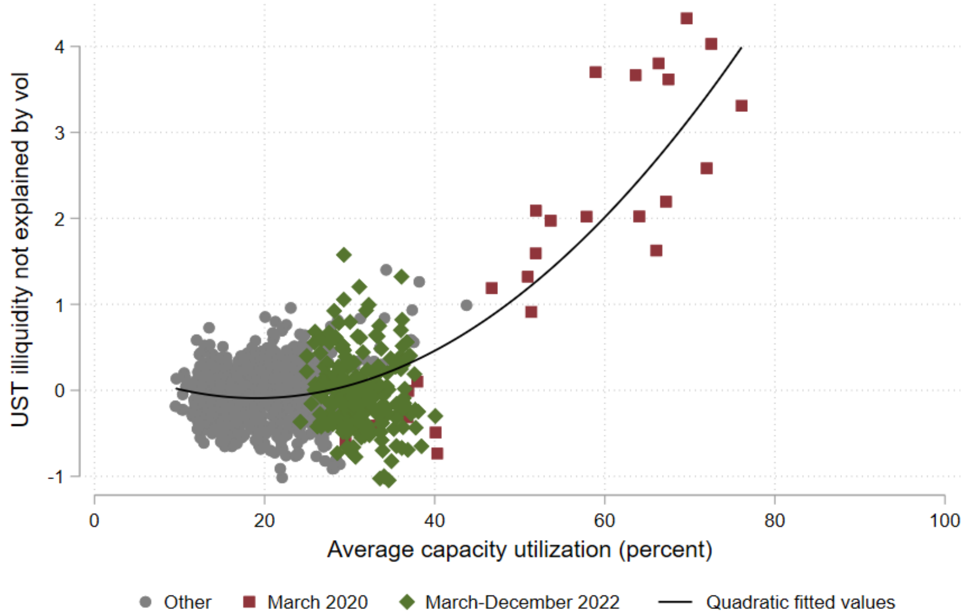


Figure 6: The relationship between average dealer capacity utilization and the residual component of the composite measure of Treasury market illiquidity that remains after controlling for average swaption-implied volatility (the residuals associated with the fitted relationship in Figure 5). Average capacity utilization is the average of dealer capacity utilization measures based on dealer gross positions, dealer net positions, gross dealer-customer volume, and net dealer-customer volume, all risk-adjusted. The plotted ordinary-least-squares fit, for July 10, 2017 to December 31, 2022 (1,336 daily observations), is the second-order polynomial $y = 0.363 - 0.048x + 0.0013x^2$, with $R^2 = 43.6\%$. All three coefficient estimates have p-values of less than 1% using Newey-West standard errors. Source: Duffie, Fleming, Keane, Nelson, Shachar, and Van Tassel (2023).

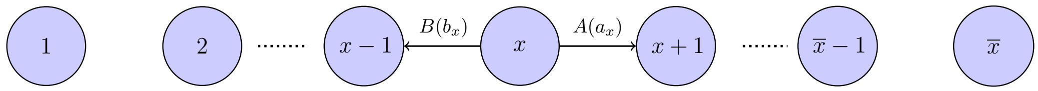
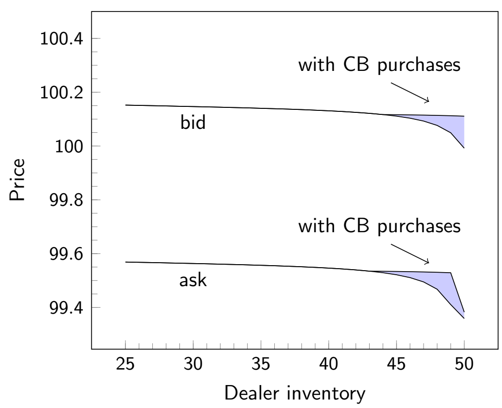
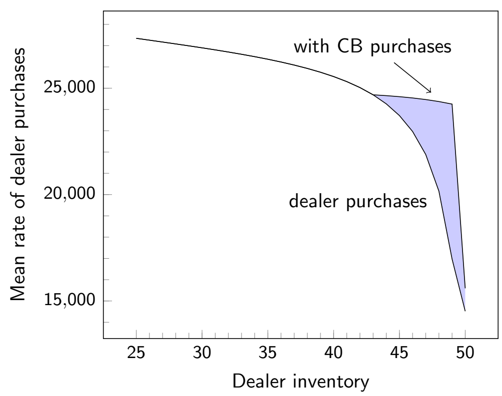


Figure 7: Schematic diagram of a model of dealer pricing and inventory management. The mean dealer purchase rate $A(a_x)$ and sale rate $B(b_x)$ from the current inventory level x are determined by dealer's chosen ask price a_x and bid price b_x. The dealer's upper bound on inventory is $\bar{x}$. The lower bound of zero, chosen for simplicity, could be replaced with any integer less than $\bar{x}$, including a negative lower bound.



(a) Dealer bid and ask quotes. The difference between the quotes with a central-bank market-function purchase program and without are the height of the blue shaded area.



(b) Mean time rate of dealer purchases from customers, transactions per year. The difference between the dealer purchase rate with a central-bank market-function purchase program and without is the height of the blue shaded area.

Figure 8: Dealer quotes (panel (a)) and purchase rates (panel (b)) for the model described in Figure 7, with dealer inventory capacity $\overline{x} = 50$, demand elasticity 400, supply elasticity 300, mean trade arrival rate constants $c = 100,000$ (buyers) and $k = 50,000$ (sellers), and discount rate is $r = 0.1$. The perpetual bond coupon yield is 10%, implying a perfect-markets bond price of $0.10/r = 1$. The prices shown are scaled by 100. The central-bank market-function purchase program is active whenever the inventory level x is at or above $\underline{x} = 45$. Central bank purchases from the dealer are at the mean rate $\lambda(x) = 0.1B(b_x)$ and at the mid-price $(a_x + b_x)/2$.

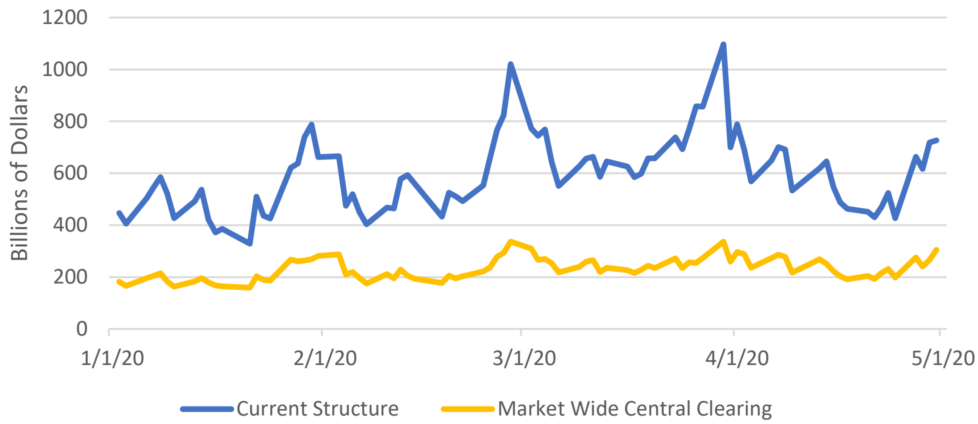


Figure 9: Total daily settlements of US Treasury securities transactions, January through April 2020, under the current market structure and in a counterfactual market structure with market-wide central clearing. Source: Fleming and Keane (2021).

References

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