RESEARCH BRIEF • APRIL 2024

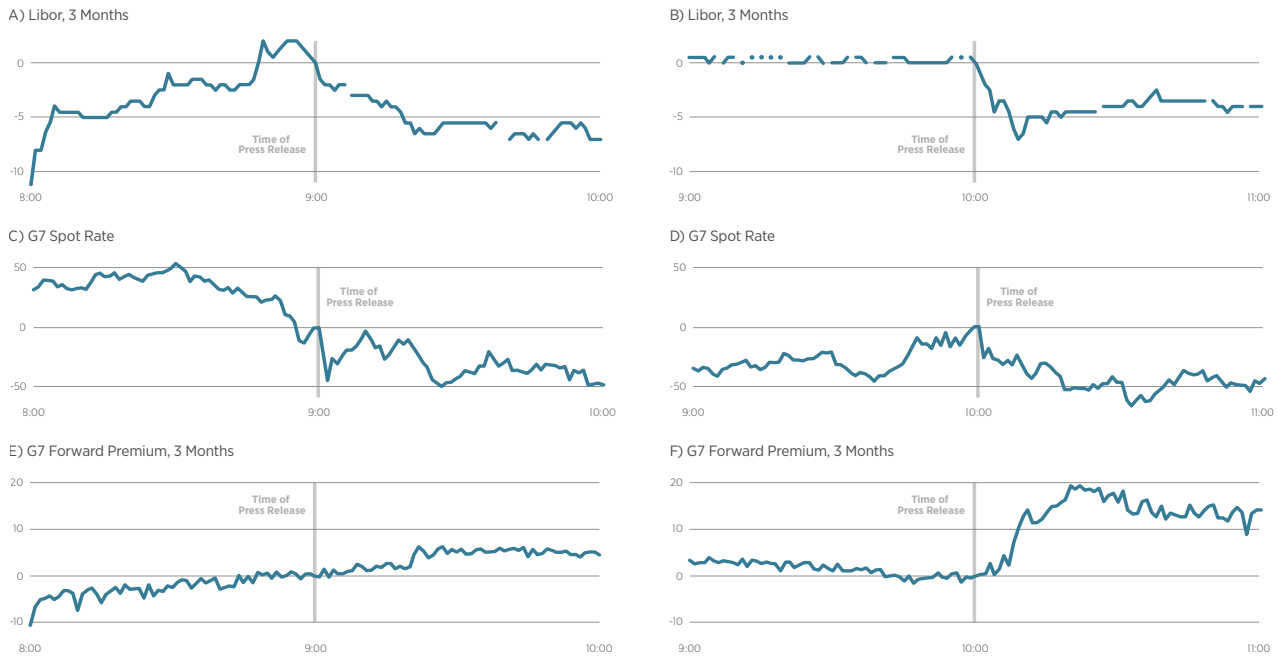
The High Frequency Effects of Dollar Swap Lines

Based on BFI Working Paper 2023-148, "The High Frequency Effects of Dollar Swap Lines," by Rohan Kekre, University of Chicago; and Moritz Lenel, Princeton University

News about expanded dollar swap lines causes a reduction in liquidity premia, compression of deviations from covered interest parity (CIP), and depreciation of the dollar; also, equity prices rise and the VIX falls, while the response of long-term government bond prices is mixed.

During the financial crisis of 2007-09, the European sovereign debt crisis in 2011-2012, and again the Covid-19 pandemic, strains in interbank markets placed extraordinary pressure on the market for dollar funding among international banks. In these episodes, the U.S. Federal Reserve stepped in to provide dollar liquidity to these foreign institutions and relieve their funding shortfalls. Specifically, the Federal Reserve lent dollars to foreign central banks in exchange for

Figure 1 • Selected Asset Prices on 3/19/20 (L) and 3/20/20 (R)



Note: These figures depict log open prices by one-minute bar, multiplied by 10,000 so that responses around press release are in basis points. All series normalized to equal zero at time of press release, depicted by vertical lines. All times are in EDT. Three-month Libor responses multiplied by minus one to depict response of (annualized) yields, G7 spot rate expressed as foreign currency per dollar, and G7 forward premium expressed as (annualized) forward rate relative to spot rate. The first row depicts declines in the Libor rate, the second row depicts dollar depreciation, and third row depicts rise in forward premium (implying compression of CIP deviation), around each announcement.

foreign currency, and foreign central banks in turn lent dollars to their domestic institutions. During the Covid-19 pandemic, foreign central banks borrowed $450bn via swap lines by May 2020, accounting for virtually all of the credit extended through liquidity facilities during the crisis, and nearly 20% of the entire increase in the Federal Reserve's balance sheet by that time.

While dollar swap lines are widely perceived as among the most important of the Federal Reserve's market interventions in recent crises, estimating their actual effects is challenging. This is in part because these policies are used precisely when the demand for dollars is very high, making it hard to tease apart the effects of increasing the supply of dollar liquidity from the effects of an increased global demand for dollars. Furthermore, it is hard to separate the effects of swap lines from the effects of other crisis responses of the Federal Reserve deployed around the same time.

The authors tackle this challenge by employing a high frequency identification strategy to assess the effects of dollar swap lines. In particular, they study the response of a variety of asset prices in thirty minute windows around swap line announcements. By focusing on these tight windows, they can estimate the effect of news about increased supply of dollar liquidity alone.

The authors focus on two announcements in response to the COVID-19 pandemic: on March 19, 2020, the Federal Reserve announced it would create temporary swap lines with nine central banks beyond the five central banks with which it already had standing facilities; and on March 20, 2020, the Federal Reserve announced it would increase the frequency of standing swap line operations from weekly to daily. Within two weeks from these announcements, swap line usage rose by more than $200bn. The authors find that news about expanded dollar swap lines causes the following:

- A reduction in liquidity premia. Liquidity premia are the extra yield built into the returns on assets if they cannot be cashed in easily or quickly.
- Compression of deviations from covered interest parity (CIP). CIP describes the relationship between interest rates and the spot rate (current price) and forward currency rates of two countries. CIP deviations with respect to the dollar are a direct measure of stresses in the interbank dollar funding market.
- Depreciation of the dollar. When the value of the dollar depreciates relative to other currencies, the price of U.S. imports rises while the price of U.S. exports falls.
- A rise in equity prices and a decrease in market instability as measured by the VIX. The VIX is the ticker symbol for the Chicago Board Options Exchange's volatility index, a measure of the expectation of volatility based on S&P volatility index options.
- Finally, a mixed response of long-term government bond prices. For example, long-term government bond futures prices rose on March 19 but fell on March 20, and the cumulative response was an order of magnitude smaller than for equities.

Bottom line: This work reveals the effects of dollar swap lines in times of financial crisis. For policymakers and researchers charged with reacting to crises, the authors' estimates can be used to quantitatively improve existing models and, thereby, better anticipate how changes in the supply of dollar liquidity will affect CIP deviations, the value of the dollar, and the price of risk.

READ THE WORKING PAPER

NO. 2023-148 · NOVEMBER 2023

The High Frequency Effects of Dollar Swap Lines

bfi.uchicago.edu/working-paper/2023-148

ABOUT OUR SCHOLAR

Rohan Kekre
Associate Professor of Economics, Chicago Booth

CHICAGO BOOTH
The University of Chicago Booth School of Business