

## Central Bank Swap Lines

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This paper provides a first analysis of the role played by these new central bank swap lines in monetary policy and on the macroeconomy. It is composed of three parts studying the effect of the swap lines: on central bank balance sheets and operations; on financial markets and the transmission of policies; and on the macroeconomy through investment decisions.

We start by describing the terms and operation of the swap contracts. This clarifies that the swap lines provide a substitute for discount-window lending by the source central bank to the recipient-country banks, using the recipient central bank as an agent that bears the credit risk. As such, the swap lines are consistent with controlling inflation and the lender of last resort role, and they are not, at least directly, tied to intervening in exchange rates, bailing out or transferring wealth to foreigners, or nationalizing private risk. We discuss why they were needed as a supplement to the traditional discount window, or to using private funding markets.

Turning to the transmission of this policy in financial markets, we prove that the sum of the gap between the swap rate and the interbank rate in the source country, and the gap between policy and deposit central bank rates in the recipient country, provides a hard ceiling on the deviations of covered interest parity (CIP) between the two currencies. Breaking this ceiling would give rise to an arbitrage opportunity. We turn to the data on CIP deviations since 2008 to confirm these results using three complementary empirical strategies: a difference-in-differences regression that uses a change in the Fed's swap rate, a time-series regression that exploits variation in domestic interest rates, and the estimation of the demand curve for liquidity, both domestic and foreign.

Then, we turn to the macroeconomic effects of the swap lines. A simple model of global banks and cross-border funding shocks predicts that the swap line reduces funding risk. A fall in the swap-line rate increases investment by recipient-country banks in origin-country currency-denominated assets. We test this prediction on a new dataset of net purchases of corporate bonds transacted in Europe. Our identification strategy relies on a change in the dollar swap-line rate, which should have an effect on the choices of financial firms under the jurisdiction of a central bank with access to these swap lines and on U.S. dollar denominated corporate bonds, relative to banks not covered and to non-dollar bonds. This triple-difference strategy, over the time of the swap rate changed, over banks covered by the swap line and those that are not, and between USD investments and bonds denominated in other currencies, finds strong evidence that an increase in the generosity of the swap line induces banks to increase their portfolio flows into USD-denominated corporate bonds.

Beyond the study of swap lines, these estimated large effects of liquidity policies on investment choices are of independent interest.

A follow-up difference-in-difference strategy shows that these portfolio shifts led to an increase in the price of the dollar corporate bonds held by European firms relative to other dollar bonds. This is consistent with the swap line being a lending facility of last resort that can prevent large price drops in the origin-country asset markets.

A final triple-difference strategy finds that, around the date where the swap-line terms became more generous, banks outside the United States with access to a central bank with a swap line that also had significant exposure to the United States, experienced excess returns. This is consistent with their funding risk being lower.

All combined, the theory and evidence support an important role for the swap lines in the global economy: (i) they perform a basic function of liquidity provision and lender of last resort with a particular form of cooperation between different central banks; (ii) they have significant effects on exchange-rate markets, especially on the price of forward contracts; and (iii) they incentivize cross-border gross capital flows, and they potentially prevent financial crises in source-country financial prices and in recipient-country financial institutions.