FEDERAL RESERVE BANK of NEW YORK

Lender of Last Resort & Central Bank Liquidity Swaps

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Traditional Lender of Last Resort

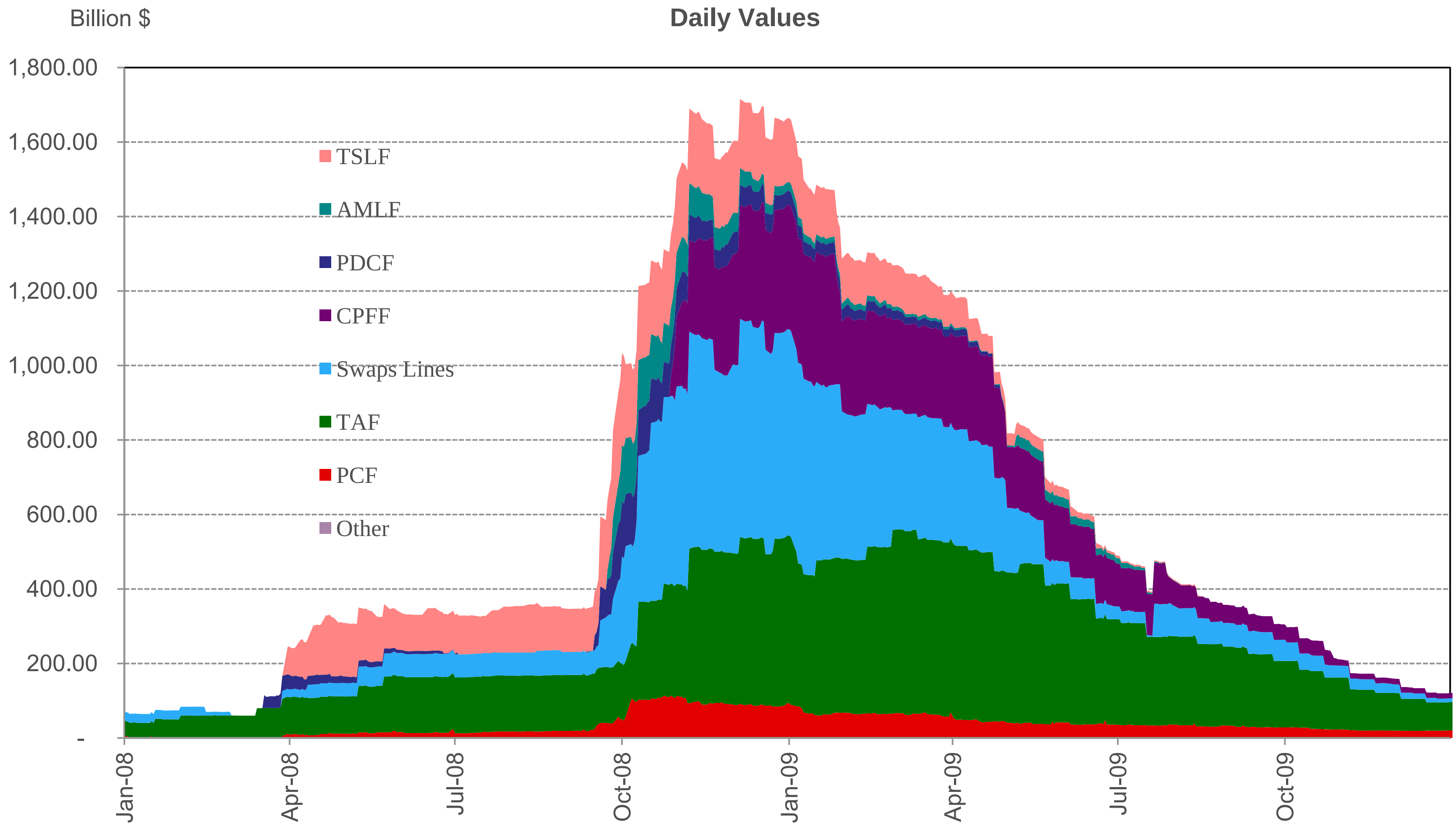
- Purpose
  - Lending to solvent financial institutions, against good collateral, at a penalty rate
  - Mitigates the externalities of liquidity risk and runs.
  - Basic function of all central banks, but institutional details often differ

- Traditional Federal Reserve LOLR arrangements
  - Primary Credit Facility (PCF), aka Discount Window)
    - "Standing Facility" available to depository institutions in sound financial condition
    - Overnight loans again broad range of collateral
    - Rate set as a spread over the target federal funds rate
  - Secondary credit

Expanded LOLR Facilities during the Crisis

- Modified existing facilities and established many temporary new ones
- Different facilities targeted different market segments and general classes of institutions
  - Institutional eligibility, types of collateral accepted, and loan maturities differed, and moved beyond traditional practice
- Mix of formats used
  - Standing facility with penalty rate vs. auctions of fixed quantities vs. full allotment tender operations
  - Avoiding stigma a consideration in design
- Lending through most facilities expanded the size of the balance sheet and level of reserves
- Participation was either self-liquidating, or terms were adjusted by Fed as financial conditions improved

Outstanding Short-Term Loans, 2008 - 2009



Source: Domestic Open Market Operations during 2010, FRBNY

Central Bank Dollar Liquidity Swaps

- Background
  - Various names are used (temporary reciprocal currency arrangements, swap lines, liquidity swaps, FX swaps)
  - Used on a smaller scale pre-crisis (e.g., 9/11)
  - Each arrangement with a foreign central bank (FCB) is authorized by the FOMC in coordination with the FCB

- Purpose:
  - Provide US dollars to FCBs for use in their jurisdictions
  - Usefulness reflects the key role of US dollar in global financial markets, and the exposure of US financial institutions and economy to global financial conditions
  - The swap of currencies between the Fed and an FCB is closely linked to the arrangements the FCB uses to distribute dollars locally

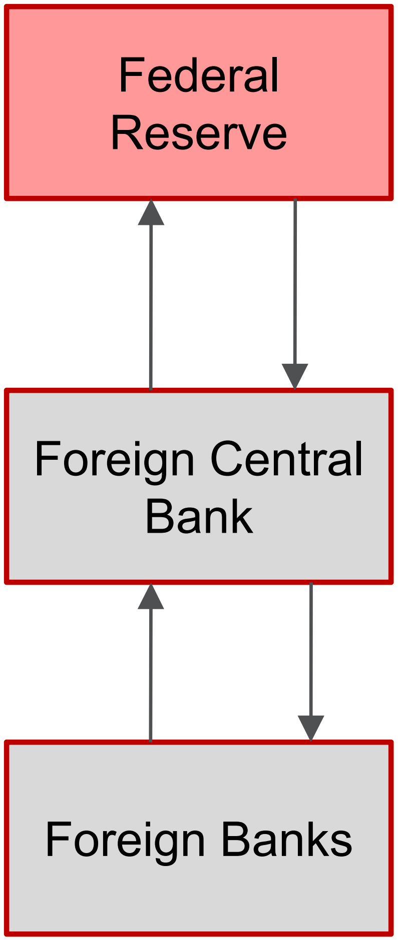
Mechanics of Dollar Liquidity Swaps

Federal Reserve ←→ Foreign central bank

- Agree to a temporary “swap” of U.S. dollars for foreign currency: one spot and one forward transaction
- Rate of exchange of the currencies for the spot and forward transactions based on current spot market rate
- Length of the swap and the interest rate FCB pays Fed for temporary use of dollars are linked to the lending terms between the FCB and its local banks
- **Fed exposure is to the FCB**

Foreign central bank ←→ Foreign institutions

- Lending terms between FCB and its local banks developed in consultation with Fed
  - These have varied
- Loan Maturities: up to 3 months
- Formats for setting rates and quantities:
  - fixed rate, full allotment
  - variable or uniform rate auctions of a fixed quantity
- FCB responsible for determining eligible counterparts and range of acceptable collateral.
- **FCB bears all risk of loans it makes to all local banks**



FCB Operation Formats

Auctions of Fixed Quantities

- Minimum’s bidding rates were based on market rates
  - OIS+50 was frequently used
  - Overnight Index Swap rate is a measure of market participants’ expected average federal funds rate over the relevant term
- Actual rate was dependent on results of FCBs competitive auctions
- Quantities could be adjusted over time in response to financial conditions

Full Allotment Tender Operations

- Used fixed rates, based on market rates + spread
- Often used OIS + 100 basis points
- Spread could be adjusted over time in response to financial conditions

Use of Dollar Liquidity Swaps since 2007

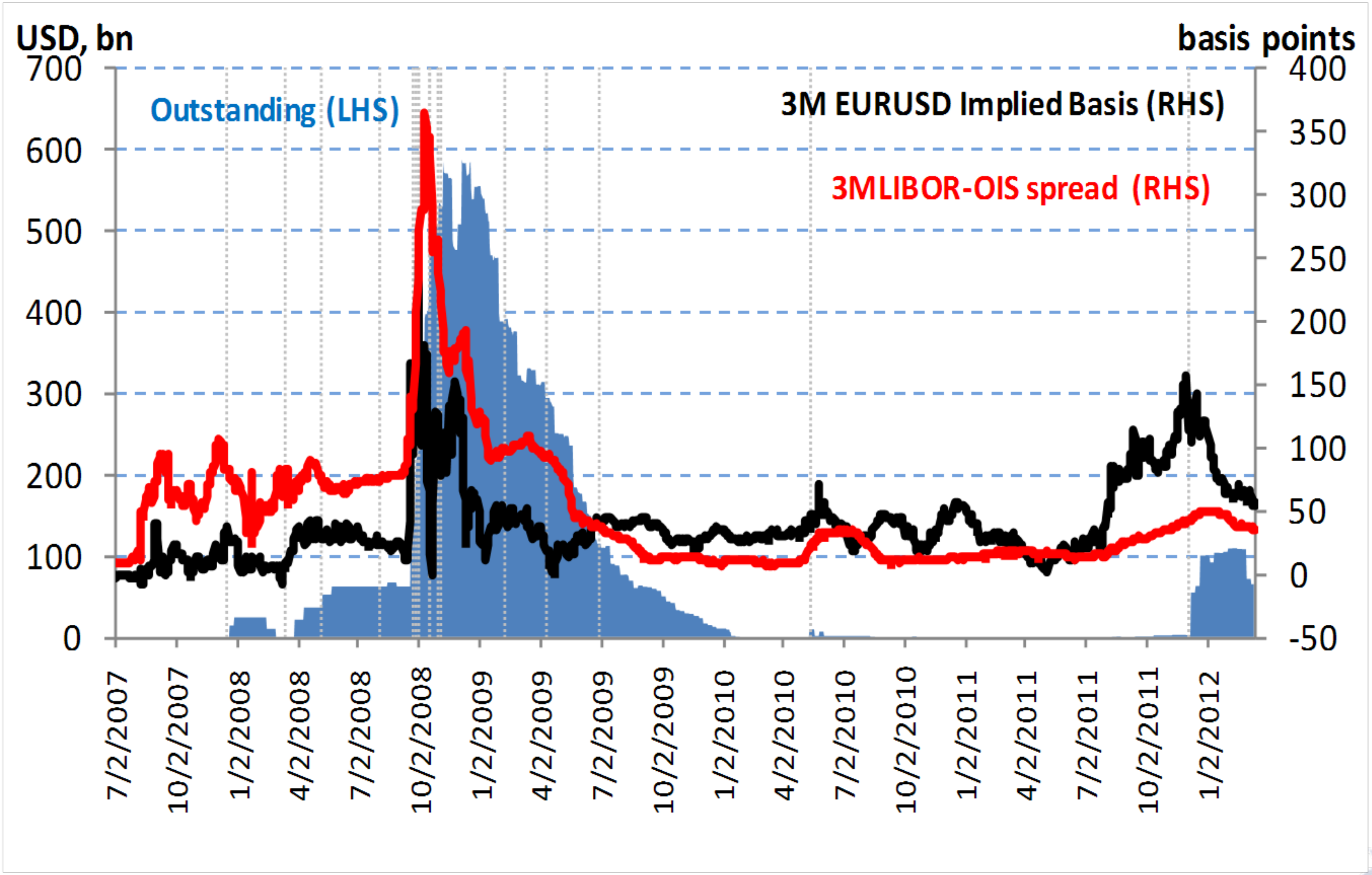
- First used in the financial crisis in December 2007
  - Initially only with only two central banks (ECB and SNB)
  - Operations coincided with Term Auction Facility (TAF) operations in the U.S.

- Expanded after September 2008
  - Scale of operations expanded enormously
  - Number of central bank counterparties reached 14
  - Arrangements expired in early 2010

- Re-introduced in May 2010 with 5 counterparties
  - Lending rate lowered in November 2011
  - Set to expire in February 2013

- Foreign-currency liquidity swaps have also been set up
  - unused to date

Use of Swaps and Indicators of Market Stress



Reference Slides

Evolution of the Liquidity Swaps

date	FOMC decision	new participants	total RCA authorization (bn)	extended terms	extend expiration
December 12, 2007	Establish RCA with ECB ($20 bn) and SNB ($4 bn); 28-day auctions; Agreeement for 6-months		$24		
March 11, 2008	Expands lines with the ECB ($30 bn) and the SNB ($6 bn)		$36		
May 2, 2008	Expand lines with ECB ($50 bn) and SNB ($12 bn) and extend to Jan 30, 2009		$62		x
July 30, 2008	Expand ECB ($55 bn) line; ECB and SNB add 84-day auction		$67	x	
September 18, 2008	Expand ECB and SNB lines to $110 bn and $27 bn, respectively. Establish facilities with BOJ, BOE, BOC in amount of $60 bn, $40 bn, $10 bn, respectively.	x	$247		
September 24, 2008	Establish RCA with RBA ($10 bn), Danmarks Nationalbank ($5 bn), Sweden Riksbank ($10 bn), Norges Bank ($5 bn)	x	$277		
September 26, 2008	Expand lines to ECB ($120 bn) and SNB ($30 bn).		$290		x
September 29, 2008	Expand ECB ($240 bn), SNB ($60 bn), BOC ($30 bn), BOE ($80 bn), BOJ ($120 bn), Danmarks Nationalbank ($15 bn), Norges Bank ($15 bn), RBA ($30 bn), Riksbank ($30 bn). Extend agreements until April 30, 2009.		$620		
October 13, 2008	Expand ECB, SNB, and BOE to accommodate quantity demanded; BoJ considers same		$120 + full allotment		
October 14, 2008	Expand RCA with BOJ to accommodate quantity demanded		$120 + full allotment		
October 28, 2008	Extend $15 bn swap line to RBNZ	x	$120 + full allotment		
October 29, 2008	Extended up to $30 bn each to Brazil, Mexico, Korea, Singapore; swap lines authorized until Apr 30, 2009	x	$120 + full allotment		
February 3, 2009	Extend swap agreements until October 30, 2009		$120 + full allotment		x
April 6, 2009	Fed announces arrangement with BOE, ECB, BOJ, SNB to provide foreign currency liquidity to U.S. institutions		$120 + full allotment		
June 25, 2009	Extend swap agreements until February 1, 2010		$120 + full allotment		x
February 1, 2010	Swap apgreements expire				
May 9, 2010	Re-establish swap agreements with the BOC ($30 bn) and the ECB, SNB, BOJ, and BOE to accommodate quantity demanded		$30 + full allotment		x
December 21, 2010	Extend swap agreements until August 1, 2011		$30 + full allotment		x
June 29, 2011	Extend swap agreements until August 1, 2012		$30 + full allotment		x
November 30, 2011	Extend swap agreements until February 1, 2013; Reduce rate to OIS+50 basis points; Establish network of bilateral swap arrangements to provide foreign currency liquidity to U.S. institutions		$30 + full allotment		x

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Where to Find More Info?

- Federal Reserve BoG website provides background and FAQ in “Credit and Liquidity Programs and the Balance Sheet”
- Fed’s H.4.1 provides outstanding draws on swaps
- Treasury’s U.S. International Reserve Position data provides outstanding by residual maturity. Same data also on IMF’s website
- FRBNY’s Quarterly “Treasury and Federal Reserve Foreign Exchange Operations”
- Foreign central banks publish the results of each U.S. dollar operation using proceeds from the swap facility
- FRBNY’s weekly release on FX swap activity
- December 1, 2010 “Dodd-Frank” disclosures are the most comprehensive
- FRBNY Research publications:
  - *Current Issues: “The Federal Reserve’s Foreign Exchange Swap Lines”*
  - *Economic Policy Review: “Central Bank Dollar Swap Lines and Overseas Dollar Funding Costs”*