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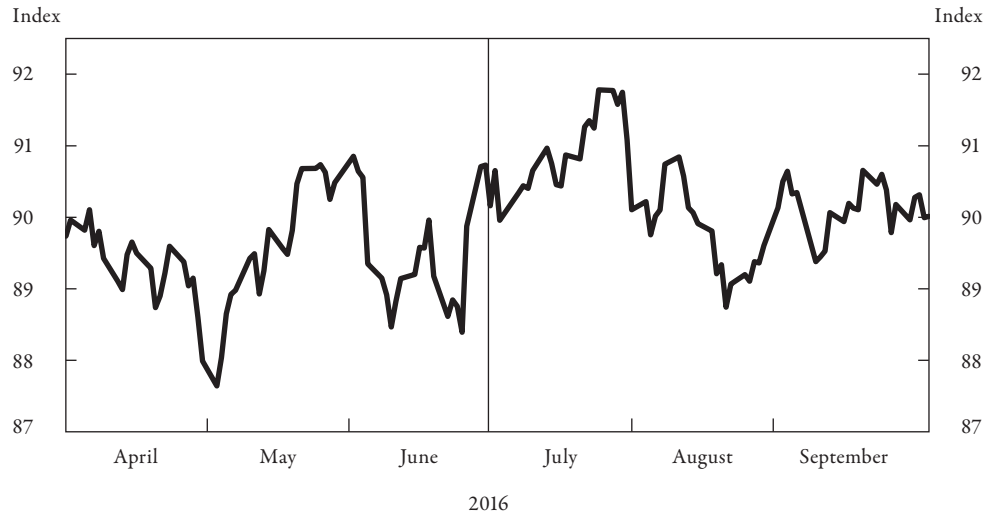
# TREASURY AND FEDERAL RESERVE FOREIGN EXCHANGE OPERATIONS

*July–September 2016*

In the third quarter of 2016, the U.S. dollar, as measured by the Federal Reserve Board’s trade-weighted major currencies index, declined 0.7 percent. Movements in the dollar during the quarter were driven by U.S. economic data, which were mixed, Federal Reserve communications about the outlook for monetary policy, and foreign developments, including monetary policy in Japan and developments in the United Kingdom following the June referendum on membership in the European Union (EU). The U.S. dollar depreciated 1.8 percent and 1.1 percent against the Japanese yen and euro, respectively, during the quarter, but appreciated 2.6 percent against the British pound and 0.4 percent against the Chinese renminbi. Emerging market currency performance varied during the third quarter. U.S. monetary authorities did not intervene in the foreign exchange markets during the quarter.

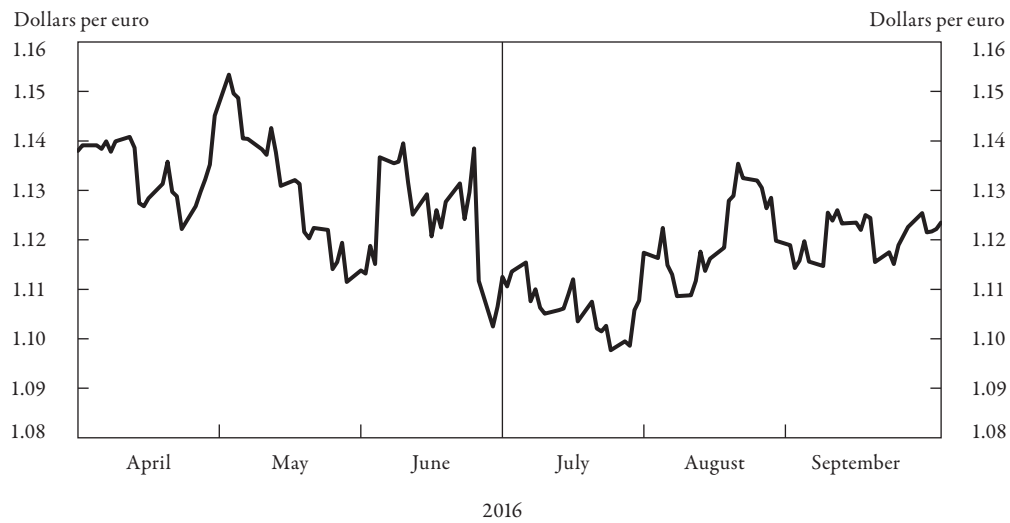
*This report, presented by Simon Potter, Executive Vice President, Federal Reserve Bank of New York, and Manager of the System Open Market Account, describes the foreign exchange operations of the U.S. Department of the Treasury and the Federal Reserve System for the period from July through September 2016. Rodrigo Gonzalez was primarily responsible for preparation of the report.*

Chart 1  
MAJOR CURRENCY TRADE-WEIGHTED U.S. DOLLAR



Sources: Board of Governors of the Federal Reserve System; Bloomberg L.P.

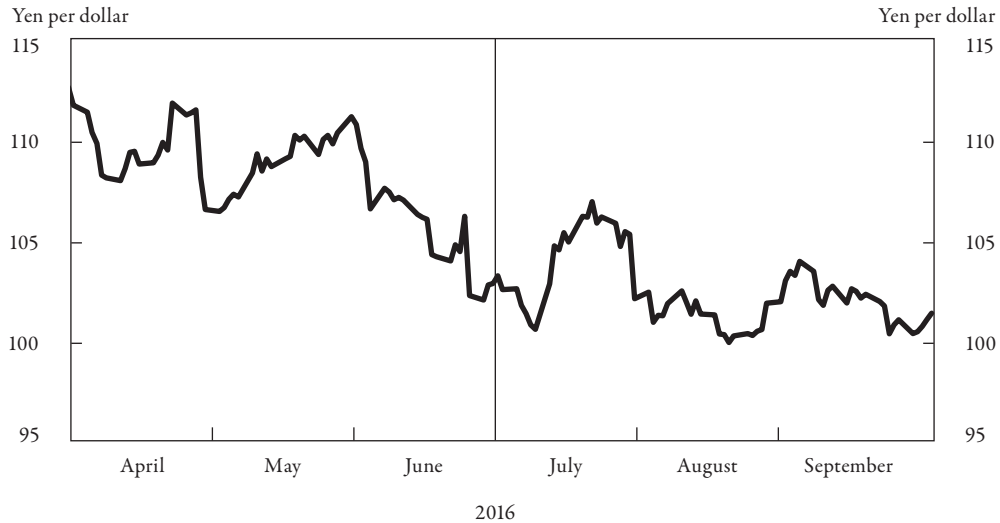
Chart 2  
EURO-U.S. DOLLAR EXCHANGE RATE



Source: Bloomberg L.P.

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*Chart 3*  
U.S. DOLLAR–YEN EXCHANGE RATE



Source: Bloomberg L.P.

### U.S. DOLLAR DEPRECIATES MODESTLY AMID MIXED ECONOMIC DATA WHILE EXPECTATIONS FOR U.S. MONETARY POLICY REMAIN LITTLE CHANGED

In the third quarter, the trade-weighted major currencies dollar index declined 0.7 percent. U.S. economic data over the quarter were mixed and market expectations for U.S. monetary policy were little changed. The June 23 U.K. referendum to leave the EU continued to impact the market into the early part of the third quarter, with demand for safe-haven currencies remaining strong amid a relatively high level of implied and realized global currency volatility. The most pronounced impact of the referendum was on the British pound, which depreciated sharply between June 23 and early July. As the pound stabilized later in the quarter, investor attention refocused on incoming U.S. economic data and the path of U.S. monetary policy.

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U.S. economic data released throughout the quarter were mixed, which supported market participants' expectations that the path of U.S. monetary policy would remain relatively unchanged. Second-quarter U.S. GDP data, the July Consumer Price Index (CPI), and July retail sales were all lower than expected by market participants, contributing to modest depreciation pressure on the dollar. However, the data releases were somewhat offset by employment data over the quarter, specifically the above-consensus July Employment Situation Report, which market participants interpreted as continuing to show improvement in the labor market.

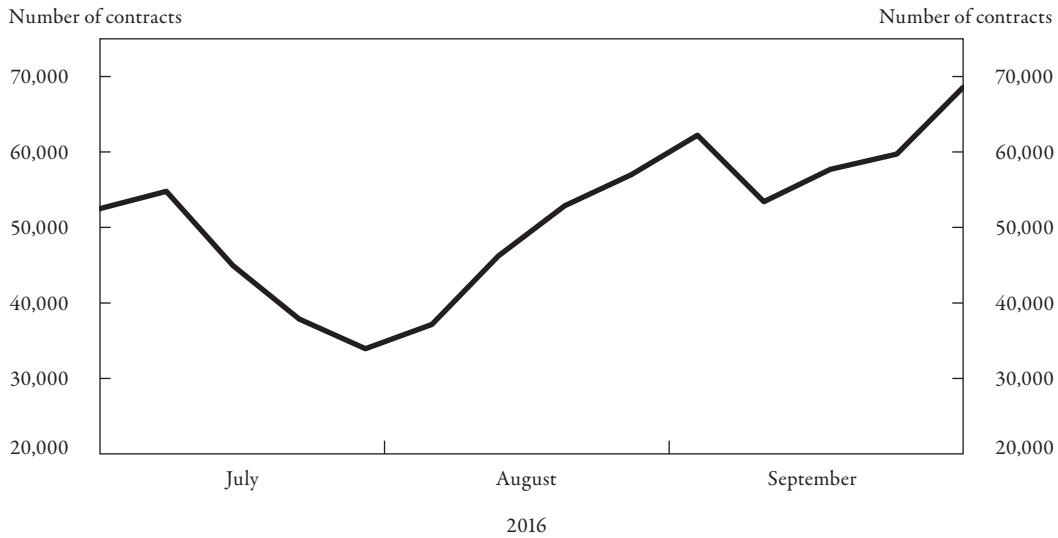
Federal Reserve communications during the quarter, on net, had little impact on the dollar since they did not meaningfully change expectations for the path of U.S. monetary policy. While the July Federal Open Market Committee (FOMC) statement was not perceived by market participants as changing expectations for the path of policy over the near term, subsequent comments by a number of Federal Reserve officials were interpreted as pointing to an increased likelihood of a rate hike later in the year. However, the September FOMC events, including the statement and subsequent press conference, were interpreted by market participants as striking a balance between a potential rate increase and a more gradual path of normalization. Overall, implied rates on federal funds futures were little changed over the quarter.

#### YEN AND EURO APPRECIATE FOLLOWING PERCEPTION OF LESS-ACCOMMODATIVE BOJ POLICY AND ABOVE-CONSENSUS EURO-AREA DATA

The dollar depreciated 1.8 percent against the Japanese yen in the third quarter. Early in the period, the yen appreciated on safe-haven flows driven by market uncertainty following the U.K. referendum. Yen appreciation continued following the July 29 Bank of Japan (BoJ) meeting and the announcement of the Japanese government's fiscal stimulus package, both of which were viewed by market participants as less accommodative than expected.

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*Chart 4*  
NET LONG YEN FUTURES AND OPTIONS OUTSTANDING



Sources: Commodity Futures Trading Commission; Bloomberg L.P.

At its scheduled policy meeting on September 21, the BoJ announced a new policy framework termed “Quantitative and Qualitative Monetary Easing with Yield Curve Control.” The new framework included a target of 0 percent for the 10-year Japanese government bond yield and an “inflation-overshooting commitment” to maintain monetary expansion until the 2 percent inflation target is exceeded sustainably. The yen was little changed against the dollar following the BoJ announcement as market participants assessed the impact of the new policy. Yen net long positioning among non-commercial market participants on the Chicago Mercantile Exchange increased over the quarter and remained elevated compared with historical averages.

The euro appreciated 1.2 percent against the dollar during the third quarter. Early in the period, the euro depreciated almost 4 percent against the dollar in the wake of the June 23 U.K. referendum, but this trend reversed in early August as some of the near-term political uncertainty regarding the referendum declined and some euro-area economic data exceeded market expectations. In particular, July Manufacturing and Services Purchasing Managers’ Index (PMI) data were above consensus

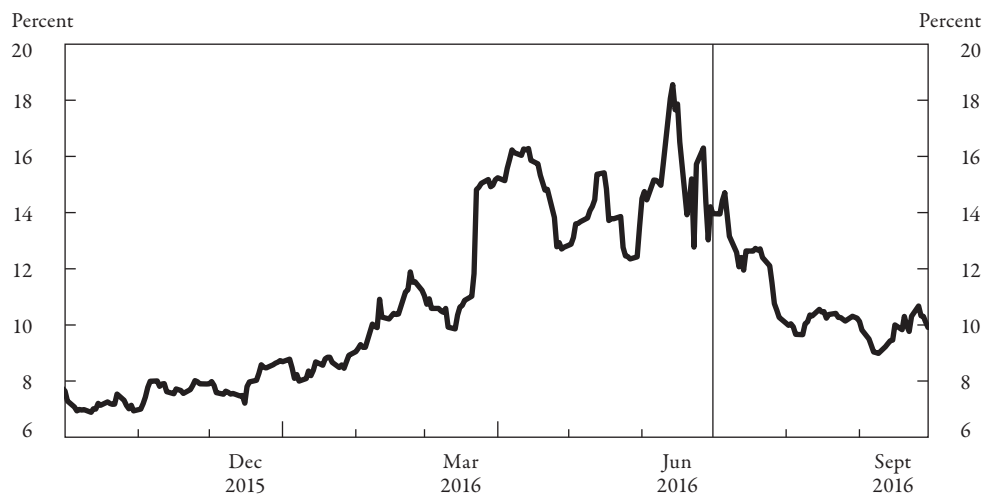
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forecasts, contributing to lower expectations for further policy easing by the European Central Bank (ECB) as implied by Euro Area Overnight Index Average (EONIA) swap rates. At the September 8 ECB meeting, the central bank left its key policy rates and forward guidance unchanged, as expected by market participants.

### BRITISH POUND CONTINUES TO DEPRECIATE AMID CONCERNS OVER U.K. REFERENDUM

After depreciating as much as 13 percent against the dollar in the two weeks following the U.K. referendum, the pound continued to weaken in the third quarter, though by a more modest 2.6 percent against the dollar. Pound-dollar exchange rate realized and implied volatility declined over the quarter, though both measures remained above historical averages. The term structure of pound-dollar implied volatility also normalized over the quarter, compared with being downward sloping at the end of the second quarter, as short-dated implied volatility options declined over the period.

*Chart 5*  
BRITISH POUND–U.S. DOLLAR THREE-MONTH OPTION-IMPLIED VOLATILITY



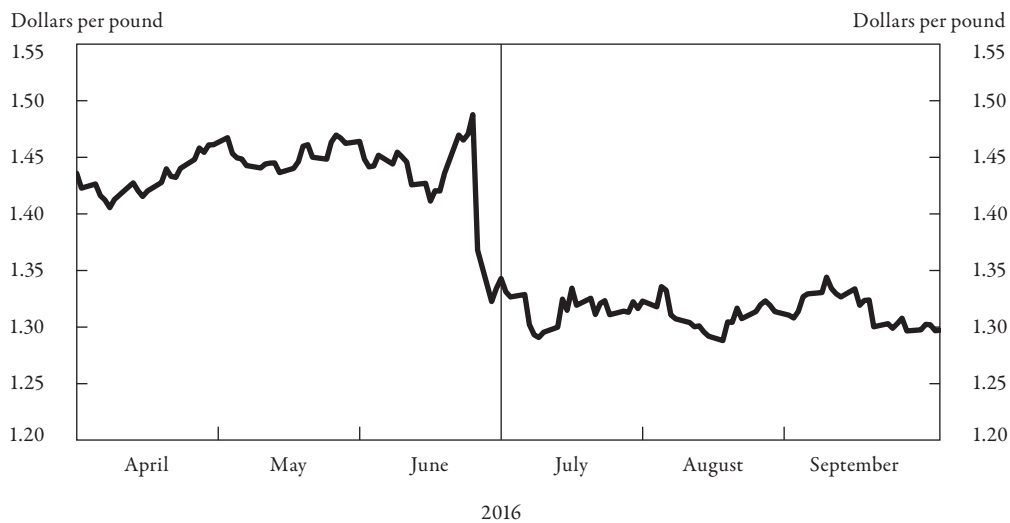
Source: Bloomberg L.P.

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Over the quarter, in addition to the immediate impact of the referendum, the pound was largely driven by Bank of England (BoE) policy decisions, concerns over U.K. negotiations to exit the EU, and incoming economic data. The pound depreciated almost 2 percent against the dollar following the August 4 BoE Monetary Policy Committee meeting, where more-accommodative-than-expected monetary policy measures were announced. The policy measures included a 25 basis point cut to the BoE's official bank rate to 0.25 percent, an increase in the central bank's asset purchase program, and a new corporate bond purchase program of non-financial, investment-grade bonds.

Market participants' perception that exit negotiations between the U.K. and EU might prove to be contentious following comments from U.K. and EU officials also weighed on the pound. Given the uncertain outlook for the U.K. economy in the aftermath of the referendum, above-consensus incoming economic data, including the August PMI, helped support greater stability in the pound.

*Chart 6*  
BRITISH POUND–U.S. DOLLAR EXCHANGE RATE



Source: Bloomberg L.P.

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EMERGING MARKET CURRENCIES ARE MIXED AGAINST THE DOLLAR;  
THE RENMINBI DEPRECIATES MODESTLY

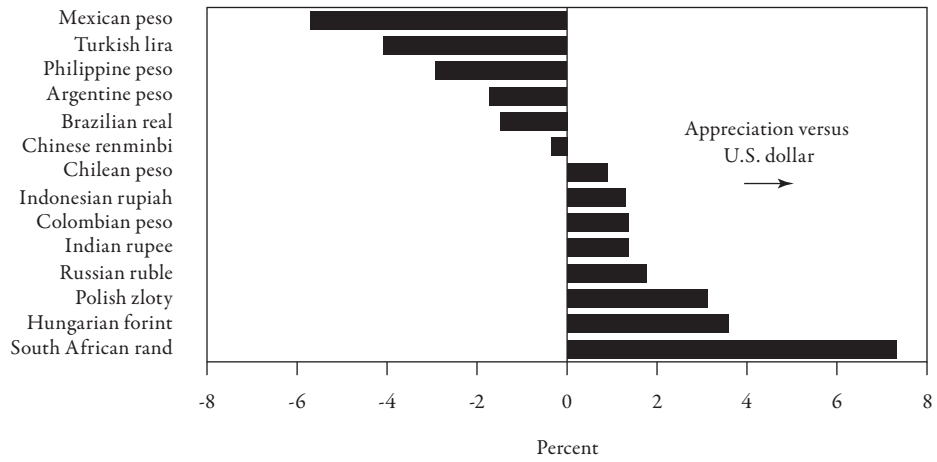
During the quarter, emerging market currency performance was mixed against the dollar. Emerging market currencies were generally resilient following the U.K. referendum because of the more limited financial and economic linkages between emerging markets and the U.K., short-lived reaction of most global financial markets to the event, and increased expectations by market participants for more-accommodative global central bank policy. Later in the quarter, some emerging market currencies were supported by investor demand for higher-yielding financial assets, given low interest rates in advanced economies and expectations for ongoing accommodative monetary policy in the United States, the euro area, and Japan. Option-implied emerging market currency volatility remained low relative to the previous quarter, also supporting higher-yielding emerging market currencies. Indeed, foreign portfolio flows to emerging markets increased notably over the quarter.

While many emerging market currencies appreciated against the dollar during the quarter, a few notably underperformed relative to the dollar owing to more idiosyncratic factors. In particular, the Mexican peso depreciated 5.7 percent against the dollar over the quarter, which market participants attributed to deteriorating economic fundamentals, use of the peso as a proxy hedge for other emerging market assets, and uncertainty over the U.S. presidential election. The depreciation of the peso led Mexico's central bank to raise its policy rate by 50 basis points on September 29. Elsewhere, the Turkish lira depreciated 4.1 percent against the dollar as market participants remained concerned about domestic political developments.

The Chinese renminbi depreciated 0.4 percent against the dollar during the quarter, compared with a depreciation of almost 3 percent against the dollar in the second quarter. Market participants attributed the modest renminbi depreciation against the dollar to factors including capital outflows related to merger and acquisition activity by Chinese firms, as well as hedging of foreign-denominated liabilities.

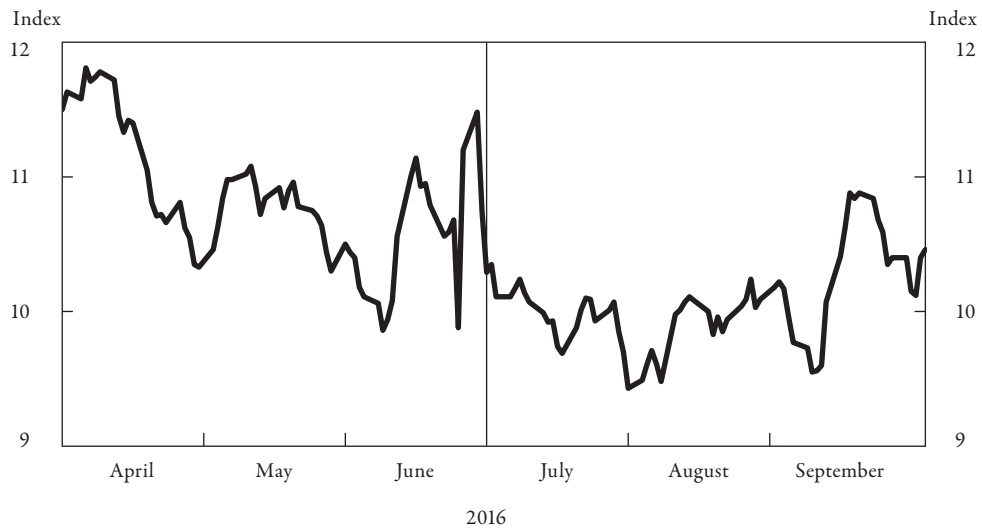


*Chart 7*  
**EMERGING MARKET CURRENCIES PERFORMANCE AGAINST THE U.S. DOLLAR DURING THIRD QUARTER**



Source: Bloomberg L.P.

*Chart 8*  
**JP MORGAN EMERGING MARKET CURRENCY VOLATILITY INDEX**



Sources: JP Morgan; Bloomberg L.P.

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## TREASURY AND FEDERAL RESERVE FOREIGN EXCHANGE HOLDINGS

The U.S. monetary authorities did not undertake any intervention operations during the quarter. As of September 30, the value of the U.S. Treasury's Exchange Stabilization Fund foreign-currency-denominated assets totaled \$21.5 billion, comprised of euro and yen holdings. The Federal Reserve System Open Market Account holdings of foreign-currency-denominated assets totaled \$21.5 billion, also comprised of euro and yen holdings.

### *Foreign Exchange Reserve Holdings*

The U.S. monetary authorities invest their foreign currency reserves, which are held in the System Open Market Account (SOMA) and the Exchange Stabilization Fund (ESF), in a variety of instruments that yield market rates of return in their respective currencies and have a high degree of liquidity and credit quality. The Authorization for Foreign Currency Operations defines the permitted investments for the SOMA foreign currency portfolio.

A significant portion of the U.S. monetary authorities' foreign exchange reserves is typically invested on an outright basis in German, French, and Japanese government securities. A smaller portion of the reserves is typically invested in euro-denominated repurchase agreements. The securities accepted in repurchase agreements are typically consistent with the investments made on an outright basis. Foreign currency reserves may also be invested at the Bank for International Settlements and in facilities at other official institutions such as the Deutsche Bundesbank, the Banque de France, and the BoJ. To the greatest extent practicable, the investments are split evenly between the SOMA and the ESF.

As of September 30, the euro reserves held by both the SOMA and ESF totaled \$24.5 billion. Cash held in euro-denominated deposits at official institutions increased to \$14.1 billion from \$12.9 billion, while direct holdings of euro-denominated government securities declined to \$10.4 billion from \$11.2 billion. Foreign government securities held under repurchase agreements remained at zero. The amount of yen-denominated deposits and government securities increased to \$18.5 billion at quarter-end from \$18.2 billion, which is attributable to depreciation of the dollar against the yen.

### *Liquidity Swap Arrangements with Foreign Central Banks*

As of September 30, the ECB had \$6.3 billion and the BoJ had \$655 million of swaps in seven-day transactions outstanding. The Bank of Canada, Bank of England, and Swiss National Bank (SNB) did not have any dollar swaps outstanding at the end of the quarter.

Table 1

FOREIGN CURRENCY HOLDINGS OF U.S. MONETARY AUTHORITIES  
BASED ON CURRENT EXCHANGE RATES

Millions of U.S. Dollars

	Changes in Balances by Source					Carrying Value, September 30, 2016 <sup>e</sup>
	Carrying Value, June 30, 2016 <sup>a</sup>	Net Purchases and Sales <sup>b</sup>	Investment Earnings <sup>c</sup>	Realized Gains/Losses on Sales <sup>d</sup>	Unrealized Gains/ Losses on Foreign Currency Revaluation <sup>e</sup>	
<b>Federal Reserve System</b>						
<b>Open Market Account (SOMA)</b>						
Euro	12,054	0	(5)	0	225	12,273
Japanese yen	9,089	0	1	0	140	9,230
Total	21,143	0	(4)	0	365	21,504

	Changes in Balances by Source					Carrying Value, September 30, 2016 <sup>e</sup>
	Carrying Value, June 30, 2016 <sup>a</sup>	Net Purchases and Sales <sup>b</sup>	Investment Earnings <sup>c</sup>	Realized Gains/Losses on Sales <sup>d</sup>	Unrealized Gains/ Losses on Foreign Currency Revaluation <sup>e</sup>	
<b>U.S. Treasury Exchange Stabilization Fund (ESF)</b>						
Euro	12,035	0	(5)	0	225	12,254
Japanese yen	9,089	0	1	0	140	9,230
Total	21,124	0	(4)	0	365	21,484

Note: Figures may not sum to totals because of rounding.

<sup>a</sup> Carrying value of the reserve asset position includes interest accrued on foreign currency, which is based on the "day of" accrual method.

<sup>b</sup> Net purchases and sales include foreign currency purchases related to official activity, repayments, and warehousing.

<sup>c</sup> Investment earnings include accrued interest and amortization on outright holdings.

<sup>d</sup> Gains and losses on sales are calculated using average cost.

<sup>e</sup> Reserve asset balances are revalued daily at the noon buying rates.

Table 2

**BREAKDOWN OF FOREIGN RESERVE ASSETS HELD**

Carrying Value in Millions of U.S. Dollars, as of September 30, 2016

	U.S. Treasury Exchange Stabilization Fund (ESF) <sup>a</sup>	Federal Reserve System Open Market Account (SOMA) <sup>a</sup>
<b>Euro-denominated assets</b>	<b>12,254.2</b>	<b>12,273.3</b>
Cash held on deposit at official institutions	7,048.6	7,067.8
Marketable securities held under repurchase agreements <sup>b</sup>	0.0	0.0
Marketable securities held outright	5,205.6	5,205.6
German government securities	2,065.4	2,065.4
French government securities	3,140.2	3,140.2
<b>Japanese-yen-denominated assets</b>	<b>9,230.2</b>	<b>9,230.2</b>
Cash held on deposit at official institutions	4,707.0	4,707.0
Marketable securities held outright	4,523.2	4,523.2
<b>Reciprocal currency arrangements</b>		
European Central Bank <sup>c</sup>		6,348
Bank of Japan <sup>c</sup>		655
Swiss National Bank <sup>c</sup>		0
Bank of Canada <sup>c</sup>		0
Bank of England <sup>c</sup>		0
Banco de México <sup>c</sup>		0

Note: Figures may not sum to totals because of rounding.

<sup>a</sup> As of September 30, the euro SOMA and ESF portfolios had Macaulay durations of 12.76 and 12.78 months, respectively; the yen SOMA and ESF portfolios both had Macaulay durations of 9.3 months.

<sup>b</sup> Sovereign debt obligations of Belgium, France, Germany, Italy, the Netherlands, and Spain are currently eligible collateral for reverse repo transactions.

<sup>c</sup> Carrying value of outstanding reciprocal currency swaps with the European Central Bank, the Swiss National Bank, the Bank of Japan, the Bank of Canada, the Bank of England, and Banco de México.

Table 3  
**RECIPROCAL CURRENCY ARRANGEMENTS**  
Millions of U.S. Dollars

Institution	Amount of Facility	Outstanding as of September 30, 2016
<u>Federal Reserve System Open Market Account (SOMA)</u>		
<b>Reciprocal currency arrangement</b>		
Bank of Canada	2,000	0
Banco de México	3,000	0
<b>Standing dollar liquidity swap arrangement</b>		
European Central Bank	No preset limit	6,348
Swiss National Bank	No preset limit	0
Bank of Japan	No preset limit	655
Bank of Canada	No preset limit	0
Bank of England	No preset limit	0
	<u>No preset limit</u>	<u>7,003</u>
<b>Standing foreign currency liquidity swap arrangement</b>		
European Central Bank	No preset limit	0
Swiss National Bank	No preset limit	0
Bank of Japan	No preset limit	0
Bank of Canada	No preset limit	0
Bank of England	No preset limit	0
	<u>No preset limit</u>	<u>0</u>
<u>U.S. Treasury Exchange Stabilization Fund (ESF)</u>		
Banco de México	3,000	0
	<u>3,000</u>	<u>0</u>