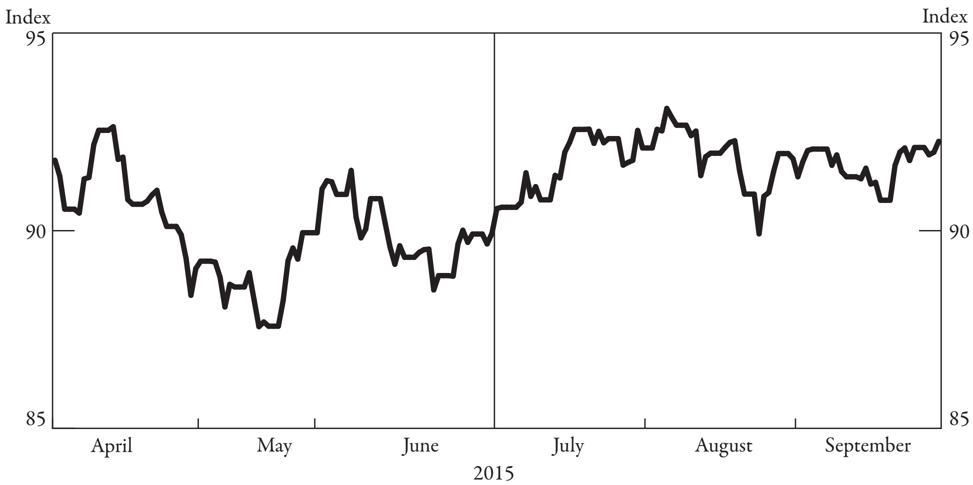
# TREASURY AND FEDERAL RESERVE FOREIGN EXCHANGE OPERATIONS

*July–September 2015*

During the third quarter of 2015, the trade-weighted U.S. dollar, as measured by the Federal Reserve Board's major currencies index, rose 2.6 percent, retracing the depreciation seen in the second quarter. A broader measure of the dollar that also includes emerging market trade partners rose more than 4 percent. Downside risks to the global growth outlook, in large part stemming from concerns about growth in emerging market economies amid declines in global equity and commodity prices, led to notable appreciation of the dollar, as well as the yen and euro, against emerging market currencies. These developments were the predominant drivers of foreign exchange price action during the quarter and led market participants to expect a greater degree of accommodation from developed-market central banks. The dollar depreciated 2.1 percent against the Japanese yen, while the euro–dollar currency pair was little changed. The U.S. monetary authorities did not intervene in the foreign exchange markets during the quarter.

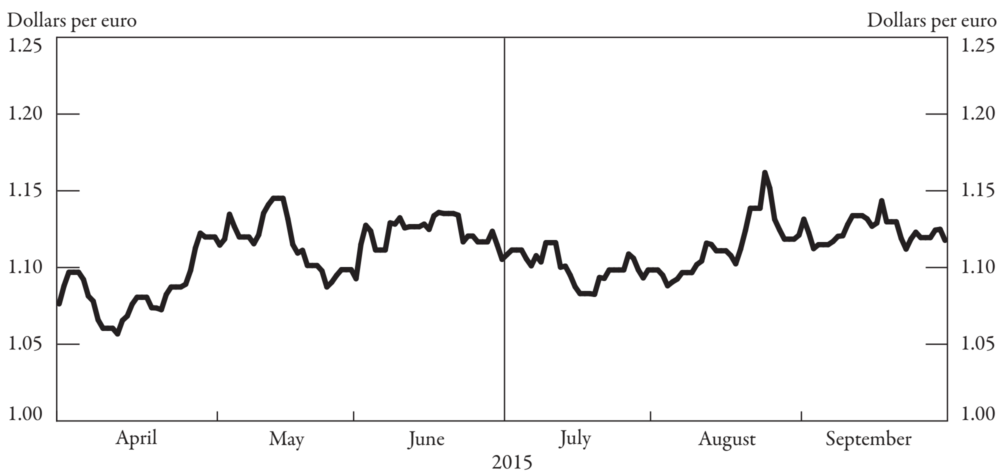
*This report, presented by Simon Potter, Executive Vice President, Federal Reserve Bank of New York, and Manager of the System Open Market Account, describes the foreign exchange operations of the U.S. Department of the Treasury and the Federal Reserve System for the period from July through September 2015. Doug Scrivani was primarily responsible for preparation of the report.*

*Chart 1*
TRADE-WEIGHTED U.S. DOLLAR




Source: Board of Governors of the Federal Reserve System.

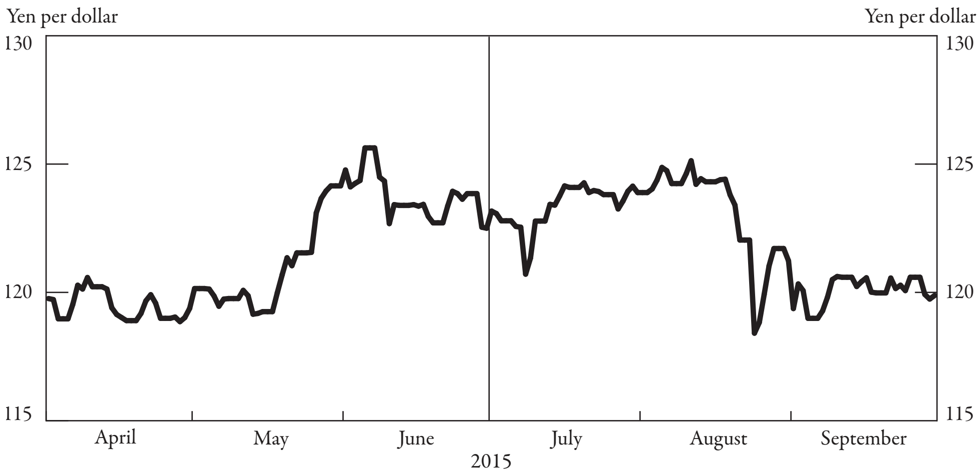
*Chart 2*
EURO–U.S. DOLLAR EXCHANGE RATE




Source: Bloomberg L.P.

*Chart 3*

U.S. DOLLAR–YEN EXCHANGE RATE




Source: Bloomberg L.P.

## GLOBAL GROWTH CONCERNS LEAD TO SIGNIFICANT DOLLAR APPRECIATION AGAINST CURRENCIES OF EMERGING MARKET AND COMMODITY-PRODUCING COUNTRIES

During the third quarter of 2015, the U.S. dollar, as measured by the Federal Reserve Board's major currencies index, appreciated 2.6 percent on net, while the Federal Reserve Board's broad trade-weighted U.S. dollar index, which includes emerging market trading partners, appreciated 4.6 percent. Price action was largely driven by global growth concerns, which weighed on market sentiment and risk assets such as equities and commodities. Concerns over global growth largely pertained to emerging market economies. A wide array of growth indicators were weaker than expected during the quarter, leading to a 0.5 percentage point downgrade in consensus expectations for aggregate emerging market GDP in 2015.[1]

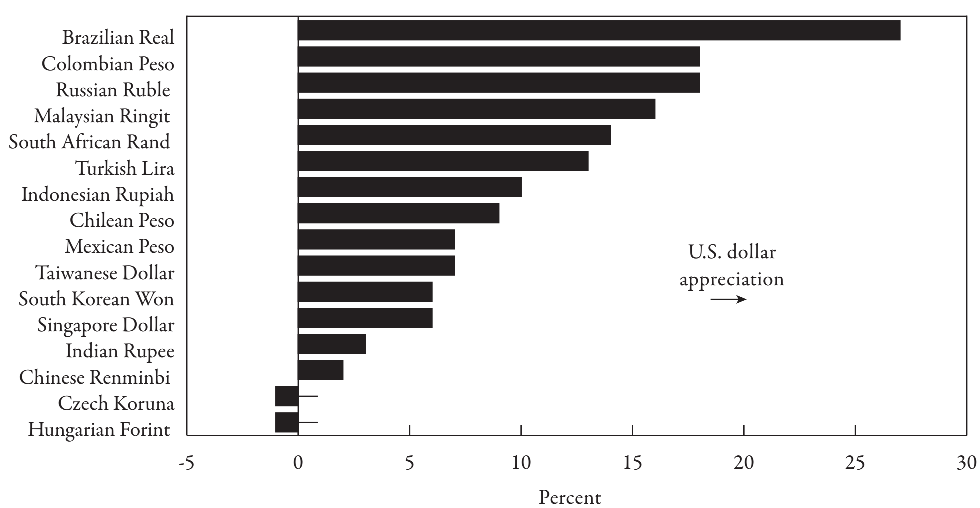
These concerns were reflected in price action across financial markets. The MSCI World equity index fell almost 9 percent in the third quarter, marking the largest quarterly decline since 2011. In commodity markets, front-month Brent crude oil futures prices fell 24 percent over the quarter to their lowest level in more than six years, while the Bloomberg Industrial Metals index declined 11 percent. Supply factors also continued to weigh on the commodity complex.

[1]As compiled by Bloomberg.

These declines contributed to the U.S. dollar's appreciation against the currencies of commodity-exporting countries. The U.S. dollar appreciated between 5 and 10 percent against currencies of commodity-exporting developed-market countries such as Canada, Australia, New Zealand, and Norway. The central banks of many of these countries cut key policy rates during the period to provide additional accommodation and help offset the effects of lower commodity prices on growth and/or inflation. However, the appreciation of the dollar was most notable against emerging market currencies, many of which also rely significantly on commodity exports for growth. During the quarter, the dollar appreciated between 14 and 27 percent against currencies of commodity-producing emerging market countries such as South Africa, Malaysia, Russia, Colombia, and Brazil.

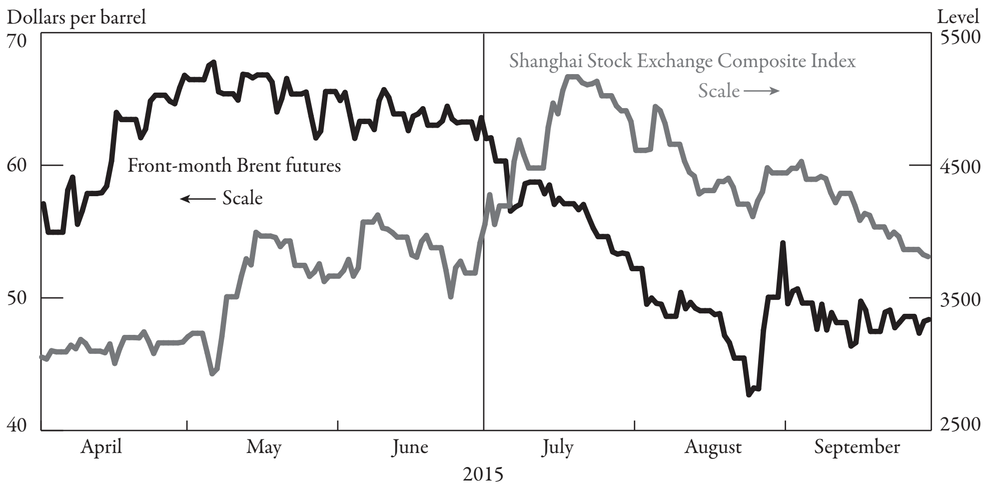
The declines in emerging market currencies have led market participants to discuss various potential vulnerabilities of these regions, including the substantial degree of foreign-currency-denominated debt issued by firms in some of these nations, rising inflation, and the need to attract inflows to finance deteriorating current account balances. While cautious, market participants have also cited some mitigating factors to these concerns. Unlike in prior periods of emerging market currency depreciation, countries today tend to have more flexible exchange rates, longer-duration debt profiles, and a more substantial level of foreign exchange reserve holdings.

*Chart 4*
U.S. DOLLAR PERFORMANCE AGAINST EMERGING MARKET CURRENCIES DURING THIRD QUARTER




Source: Bloomberg L.P.

*Chart 5*
CHINESE EQUITIES AND OIL PRICES



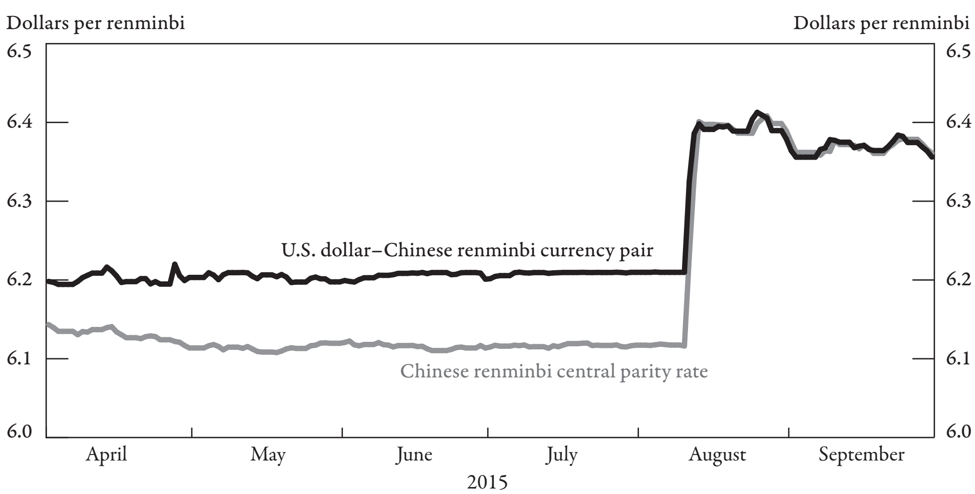

Source: Bloomberg L.P.

Amid increasing concerns about the growth outlook in emerging market economies, market participants remained especially focused on economic data releases and associated developments in Chinese financial markets. Most notably, declines in Chinese equity markets intensified, continuing the trend that began in the second quarter, and market participants reacted to Chinese economic activity data, such as official PMI prints that reached their lowest levels since 2012. The Shanghai Composite Index's nearly 30 percent decline during the third quarter reverberated into other asset classes, as market participants interpreted the moves as a potential sign that downside risks to the economic outlook of the region were rising.

An unexpected devaluation of the Chinese yuan by the People's Bank of China in early August exacerbated concerns about Chinese growth. The central bank set the onshore yuan central parity rate approximately 1.9 percent weaker against the U.S. dollar, resulting in the largest single-day move since 2005 when it reformed its exchange rate system and introduced the central parity rate. In addition to the relatively large move in the central parity rate, the central bank also announced that it was changing the valuation methodology of the central parity rate. These changes would make the daily fix a more market-based measure, with a greater emphasis placed on the previous day's market-based onshore-renminbi closing rate. The People's Bank of China said the change in the central parity rate was a "one-off" measure resulting from the sustained deviation of the central parity rate and the spot renminbi rate, and said its decision was influenced by renminbi strength on a trade-weighted basis and volatile capital flows in emerging markets. The central parity rate and spot renminbi rate converged following the move. Overall, the dollar appreciated 2.5 percent against the renminbi over the period. Most of the dollar appreciation took place in the immediate aftermath of the central bank's fixing reform, and the currency pair remained relatively stable throughout the remainder of the quarter.

The yuan exchange-rate developments also heightened market participants' attention to capital outflows from the region, in particular the potential effects those outflows may have on the level of Chinese reserves. During the quarter, Chinese authorities announced that headline foreign exchange reserves declined by roughly $200 billion, with a little less than half of the decline occurring in the month of August.[2] Market participants viewed the decline in reserves as representing intervention activity by the People's Bank of China to support both the onshore and offshore renminbi.

*Chart* 6:
U.S. DOLLAR–CHINESE RENMINBI EXCHANGE RATE AND THE RENMINBI FIXING PRICE




Source: Bloomberg L.P.

[2] September reserve data were released in early October.

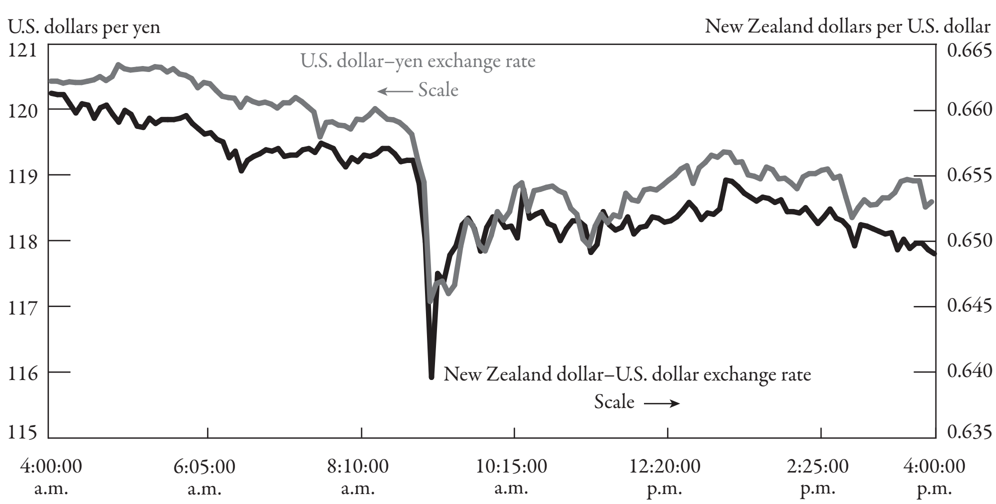
CURRENCY MARKETS EXPERIENCE SIGNIFICANT VOLATILITY IN ASSOCIATION WITH GLOBAL EQUITY DECLINES

The intensification in Chinese equity market declines and spillover to global equity markets led to a considerable increase in currency market volatility within the period. In particular, on August 24, the Shanghai Composite Index fell roughly 8.5 percent, followed by notable decreases in equities worldwide, including a 3.9 percent decline in the S&P 500. The CBOE Volatility Index, or VIX, which measures near-term volatility conveyed by S&P 500 stock index option prices, saw the largest one-day rise in roughly four years and reached its highest level since 2011.[3]

As a result, both developed and emerging market currency pairs experienced notable intraday moves, as rising volatility prompted a sharp unwinding of existing currency positions. Many currency pairs saw sharp, albeit short-lived, price action as liquidity conditions were briefly strained. For example, the Japanese yen appreciated 3 percent against the dollar in a matter of minutes while the New Zealand dollar depreciated more than 6 percent against the U.S. dollar over a similar window. Large foreign exchange orders were reportedly quoted at significantly wider spreads, implying a decrease in market depth during that period. Nevertheless, currency markets reportedly continued to function during this time amid elevated trading costs. Over the week of August 24, bid-ask spreads for a range of order sizes in most major pairs remained elevated, though they narrowed thereafter, while market depth also gradually returned to prior levels.

*Chart 7*

FOREIGN-EXCHANGE VOLATILITY ON AUGUST 24, 2015




Source: Bloomberg L.P.

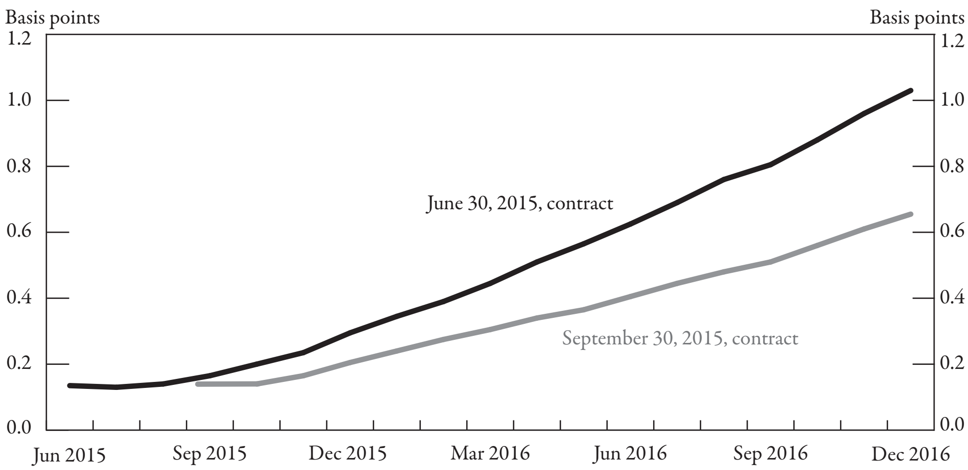
[3] https://www.cboe.com/micro/vix/vixintro.aspx

## U.S DOLLAR WEAKER AGAINST YEN, ROUGHLY UNCHANGED AGAINST EURO; RELATIVE POLICY OUTLOOKS REMAIN IN FOCUS

Elevated risk aversion across markets contributed to relative stability among the G3 currency pairs, as the euro and yen also notably outperformed most emerging market and commodity-linked currencies. The Japanese yen appreciated against all major currencies during the quarter, including increases of 2.2 and 1.9 percent against the U.S. dollar and euro, respectively. Market participants largely attributed the yen's appreciation to its perceived safe haven status and relative attractiveness during the increase in market volatility over the period, partially reflecting the home bias of Japanese investors during bouts of market turmoil. The euro was nearly unchanged, on net, against the dollar over the quarter, with the currency pair mostly trading within a range of $1.08 to $1.14 per euro. During the period, an agreement was reached between Greece and its creditors, leading to a resolution of the Greek fiscal crisis that was a focal point of markets toward the end of the second quarter.

With the increase in market volatility and decline in risk assets during the period, foreign exchange market participants were attentive to the effects that these global developments would have on the outlook of G3 central banks. In the United States, over the quarter there was a shift outward in market-based expectations for the path of the federal funds rate, which may have served as a headwind for the dollar, particularly against its G10 peers. A majority of this shift occurred following the September Federal Open Market Committee (FOMC) meeting. At this meeting, the FOMC left its policy stance unchanged while describing the domestic economic activity as expanding at a moderate pace. The FOMC noted that the labor market continued to show improvement, while inflation remained below its longer-run objective, reflecting declines in energy prices and in prices of non-energy imports. However, market participants interpreted additional FOMC communications from the September meeting as suggesting an increase in the FOMC's concern surrounding potential impacts on the domestic growth and inflation outlook from its outlook for global growth and financial market developments over the period.

*Chart 8*
IMPLIED RATES ON FEDERAL FUNDS FUTURES




Source: Bloomberg L.P.

Similar to the shift in expectations for U.S. monetary policy, some market participants increased their expectations for further easing by the European Central Bank (ECB) and the Bank of Japan (BoJ). Despite data in the euro area that has been consistent with a modest recovery, some market participants appear to have increased the probability they place on further easing by the ECB later this year or early next year, citing downside risks to the growth and inflation outlooks. Euro-area market-based inflation indicators declined to their lowest levels since the first quarter. Meanwhile, some market participants have cited declining measures of inflation expectations and market-based measures of inflation compensation, and weaker data including below-consensus industrial production, as increasing expectations for further action by the BoJ.

## 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 $19.97 billion, comprised of euro and yen holdings. The Federal Reserve System Open Market Account holdings of foreign-currency-denominated assets totaled $19.99 billion, also comprised of euro and yen holdings.

*Liquidity Swap Arrangements with Foreign Central Banks*

As of September 30, the BoJ had $539 million and the ECB had $142 million of outstanding swaps in seven-day transactions over the quarter-end. The Bank of Canada, Bank of England, and Swiss National Bank (SNB) did not have any outstanding swaps at the end of the quarter.

*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 $24.37 billion. Cash held in euro-denominated deposits at official institutions increased to $12.77 billion from $12.76 billion, while direct holdings of euro-denominated government securities increased to $11.60 billion from $11.58 billion. Foreign government securities held under repurchase agreements remained at zero. The portfolio allocation at quarter-end continues to reflect extremely low or negative rates across money market instruments in the euro area. The amount of yen-denominated deposits and government securities has remained fairly steady over recent quarters, totaling $15.6 billion at quarter-end.

*Table 1*

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

Millions of U.S. Dollars

| | Carrying Value, June 30, 2015[a] | Changes in Balances by Source: Net Purchases and Sales[b] | Changes in Balances by Source: Investment Earnings[c] | Changes in Balances by Source: Realized Gains/Losses on Sales[d] | Changes in Balances by Source: Unrealized Gains/Losses on Foreign Currency Revaluation[e] | Carrying Value, September 30, 2015[a] |
|---|---|---|---|---|---|---|
| **Federal Reserve System Open Market Account (SOMA)** | | | | | | |
| Euro | 12,180 | 0 | 5 | 0 | 9 | 12,194 |
| Japanese yen | 7,645 | 0 | 2 | 0 | 146 | 7,793 |
| Total | 19,825 | 0 | 7 | 0 | 155 | 19,986 |

| | Carrying Value, June 30, 2015[a] | Changes in Balances by Source: Net Purchases and Sales[b] | Changes in Balances by Source: Investment Earnings[c] | Changes in Balances by Source: Realized Gains/Losses on Sales[d] | Changes in Balances by Source: Unrealized Gains/Losses on Foreign Currency Revaluation[e] | Carrying Value, September 30, 2015[a] |
|---|---|---|---|---|---|---|
| **U.S. Treasury Exchange Stabilization Fund (ESF)** | | | | | | |
| Euro | 12,161 | 0 | 5 | 0 | 9 | 12,175 |
| Japanese yen | 7,645 | 0 | 2 | 0 | 146 | 7,793 |
| Total | 19,806 | 0 | 7 | 0 | 155 | 19,967 |

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

[a] Carrying value of the reserve asset position includes interest accrued on foreign currency, which is based on the "day of" accrual method.

[b] Net purchases and sales include foreign currency purchases related to official activity, repayments, and warehousing.

[c] Investment earnings include accrued interest and amortization on outright holdings.

[d] Gains and losses on sales are calculated using average cost.

[e] 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, 2015

| | U.S. Treasury Exchange Stabilization Fund (ESF)[a] | Federal Reserve System Open Market Account (SOMA)[a] |
|---|---|---|
| **Euro-denominated assets** | **12,174.6** | **12,193.7** |
| Cash held on deposit at official institutions | 6,373.9 | 6,393.0 |
| Marketable securities held under repurchase agreements[b] | 0.0 | 0.0 |
| Marketable securities held outright | 5,800.6 | 5,800.6 |
| German government securities | 2,349.2 | 2,349.2 |
| French government securities | 3,451.5 | 3,451.5 |
| **Japanese-yen–denominated assets** | **7,792.9** | **7,792.8** |
| Cash held on deposit at official institutions | 2,577.7 | 2,577.6 |
| Marketable securities held outright | 5,215.2 | 5,215.2 |
| **Reciprocal currency arrangements** | | |
| European Central Bank[c] | | 142 |
| Bank of Japan[c] | | 539 |
| Swiss National Bank[c] | | 0 |
| Bank of Canada[c] | | 0 |
| Bank of England[c] | | 0 |
| Banco de México[c] | | 0 |

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

[a] As of September 30, the euro SOMA and ESF portfolios had Macaulay durations of 12.5 months 12.6 months, respectively; the yen SOMA and ESF portfolios both had Macaulay durations of 12.2 months.

[b] Sovereign debt obligations of Belgium, France, Germany, Italy, the Netherlands, and Spain are currently eligible collateral for reverse repo transactions.

[c] 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 Sepember 30, 2015 |
|---|---|---|
| | Federal Reserve System Open Market Account (SOMA) | |
| **Reciprocal currency arrangement** | | |
| Bank of Canada | 2,000 | 0 |
| Banco de México | 3,000 | 0 |
| **Standing dollar liquidity swap arrangement** | | |
| European Central Bank | No preset limit | 142 |
| Swiss National Bank | No preset limit | 0 |
| Bank of Japan | No preset limit | 539 |
| Bank of Canada | No preset limit | 0 |
| Bank of England | No preset limit | 0 |
| | No preset limit | 681 |
| **Standing foreign currency liquidity swap arrangement** | | |
| 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 |
| | No preset limit | 0 |
| | U.S. Treasury Exchange Stabilization Fund (ESF) | |
| Banco de México | 3,000 | 0 |
| | 3,000 | 0 |