OFR MARKETS MONITOR
OFFICE OF FINANCIAL RESEARCH

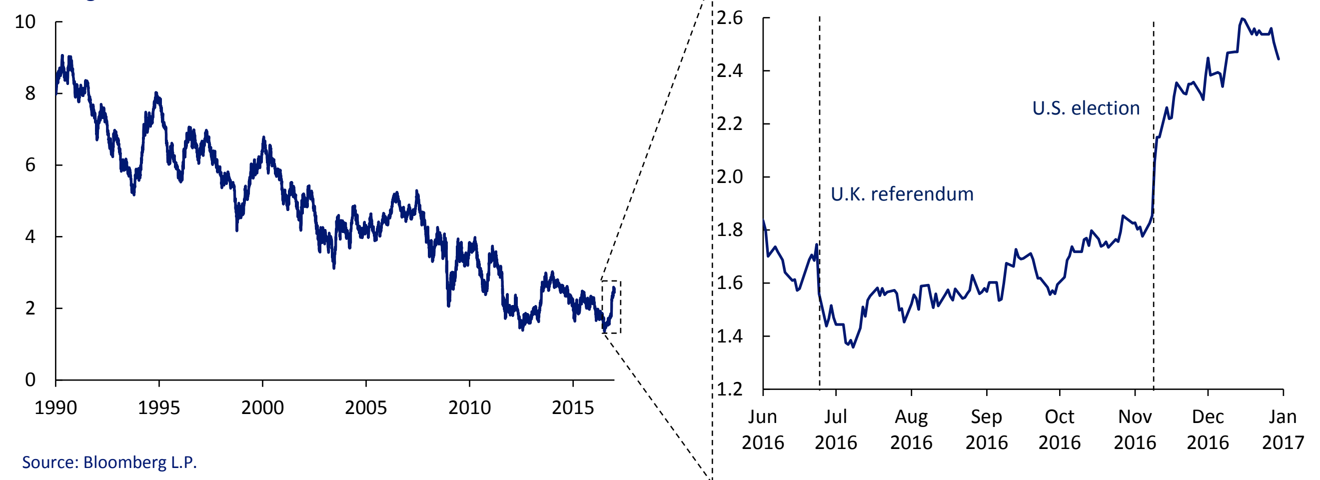
Fourth Quarter 2016
(data as of December 31)

A review of financial market themes and developments

U.S. Long-Term Interest Rates Rise, But Remain Low

U.S. long-term interest rates have risen from all-time lows in July, driven by stronger global economic data, higher inflation expectations, and growing expectations of a U.S. shift from monetary to fiscal policy stimulus. However, U.S. long-term rates and volatility remain low by historical standards (see Figure 1). Although an improving economic backdrop tempers financial stability concerns, as discussed in the OFR's 2016 Financial Stability Report and 2016 Annual Report to Congress, the combination of persistently low long-term interest rates, the high level and continued growth of U.S. nonfinancial business debt, high valuations in U.S. equity and U.S. commercial real estate markets, and challenges to major financial institutions' business models and profitability creates risks to U.S. financial stability.

Figure 1. 10-year Treasury bond yield (percent)
U.S. long-term interest rates have risen from historic lows



Source: Bloomberg L.P.

Key developments in the fourth quarter of 2016

- U.S. long-term interest rates rose sharply in the past few months, especially since the U.S. election. The 10-year Treasury yield has increased more than 100 basis points since July, when it and other global long-term rates fell to all-time lows (see Figure 1). The U.S. dollar appreciated to its strongest level in more than 10 years.
- The Federal Open Market Committee (FOMC) raised short-term interest rates 25 basis points in December as expected. Committee members projected a faster pace of tightening in 2017.
- Major U.S. stock indexes set new record highs amid a general rally in U.S. risky assets. A number of metrics show U.S. stock valuations are elevated.
- China's capital outflows accelerated, adding to an unprecedented reduction in official reserves since 2014.

This monitor reflects the best interpretation of financial market developments and views of the staff of the Office of Financial Research (OFR). It does not necessarily reflect a consensus of market participants or official positions or policy of the OFR or the U.S. Department of the Treasury. **Contributors:** Viktoria Baklanova, Ted Berg, and Daniel Stemp.

Several factors pushed long-term interest rates higher.

U.S. long-term interest rates have recently risen faster than at any time since the "taper tantrum" of 2013, although rates remain near the bottom of their historical range (see Figure 1). The yield on the benchmark 10-year Treasury bond has increased 108 basis points from its all-time low set in July, weeks after financial markets were rattled by the United Kingdom (U.K.) vote to leave the European Union. The rise in U.S. long-term interest rates was initially gradual and driven by stronger inflation and economic activity data in the United States and Europe. Rates jumped after the U.S. presidential election, in part reflecting expectations of a shift in the U.S. fiscal-monetary policy mix (see Figure 2).

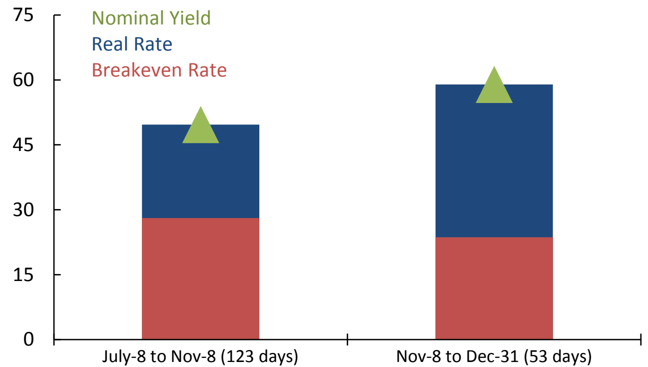
It is unclear what policies will be enacted under the new administration. With all else equal, however, a shift to fiscal stimulus, for example, through increased government spending on infrastructure and lower corporate tax rates, likely would spur economic growth, inflation, and expected future budget deficits, all of which could put upward pressure on long-term interest rates.

About a third of the total increase in U.S. 10-year Treasury note yields since the election can be attributed to higher "breakeven" rates, which capture bond market inflation compensation. Such rates are imperfect measures of inflation expectations; technical factors in bond markets also influence them. The observed U.S. inflation rate has risen from 2015 lows as oil prices have stabilized, while inflation forecasts remain anchored in a healthy range (see Figure 3).

Major foreign interest rates also moved somewhat higher.

Long-term interest rates also rose in other major economies during the fourth quarter (see Figure 4). The spike in Treasury yields and higher U.S. growth expectations were factors lifting global interest rates. Other factors were an improved economic outlook and reduced expectations for monetary policy easing in some countries. In the U.K., for example, the Bank of England refrained from additional monetary stimulus as economic data continued to be surprisingly strong in the months after the U.K. vote.

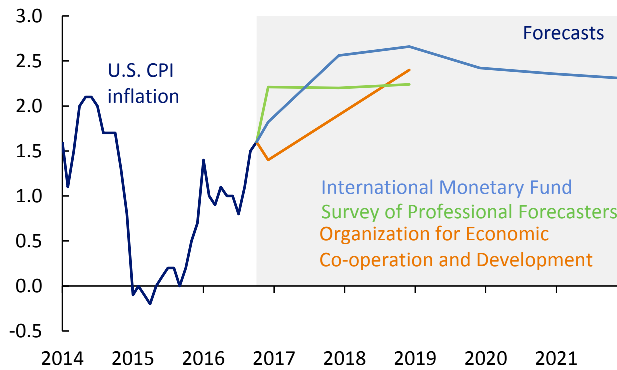
Figure 2. Changes in 10-year Treasury bond yields (basis points)
Treasury yields rose faster after the U.S. election



Note: The breakeven rate is the difference between the nominal yield of a Treasury bond and the real yield of a Treasury inflation-protected security of similar maturity.

Source: Bloomberg L.P.

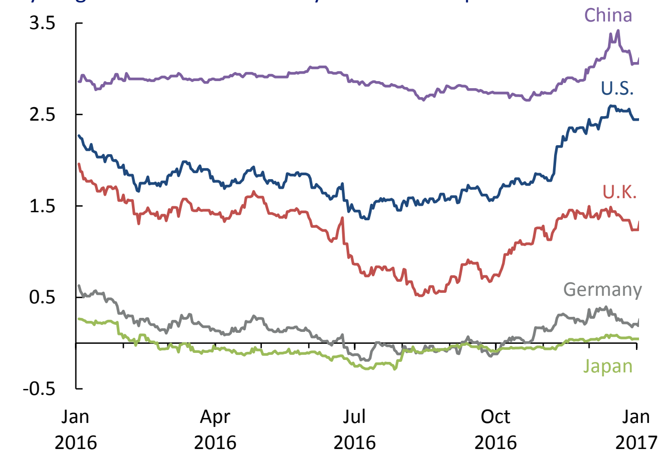
Figure 3: U.S. inflation and expectations (year-over-year percent change) Inflation is expected to rise but remain in a healthy range



Note: CPI stands for Consumer Price Index, which measures the weighted average of prices of a basket of consumer goods and services.

Sources: Organisation for Economic Co-operation and Development, Federal Reserve Bank of Philadelphia, International Monetary Fund, OFR analysis

Figure 4: 10-year sovereign bond yields (percent)
Key long-term rates rose notably in the fourth quarter



Source: Bloomberg L.P.

Markets reacted by pushing yields on 10-year U.K. government bonds up to pre-referendum levels. In the eurozone, rates increased more modestly. Japanese rates were little changed as the Bank of Japan reiterated its intention to target 10-year yields at zero percent.

The Federal Reserve raised rates for the second time since the financial crisis.

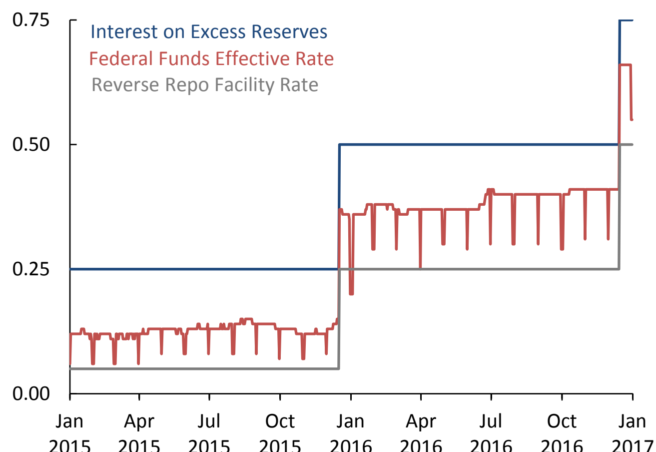
In December, the Federal Reserve's FOMC voted to raise its target for short-term interest rates by 25 basis points. This rate hike is the first since last year's "liftoff" from rates near zero percent (see the February 2016 Financial Markets Monitor). The move was widely anticipated, and trading was orderly. The effective federal funds rate quickly adjusted to trade within its new target range of 0.50 percent to 0.75 percent (see Figure 5). Rates for excess reserves and the Federal Reserve's reverse repo facility provide the bounds of the policy rate range. The median FOMC participant now projects 75 basis points of hikes in 2017, versus 50 basis points in previous projections.

The market adjustment to U.S. money market fund reform was orderly.

On Oct. 14, the Securities and Exchange Commission implemented a major reform of U.S. money market funds (see our September blog). Since the reform was announced in July 2014, approximately $1.1 trillion has shifted out of prime funds and into government funds, reducing the volume of prime funds by 67 percent. Data from the OFR's U.S. Money Market Fund Monitor show that this shift slowed after the reform (see Figure 6).

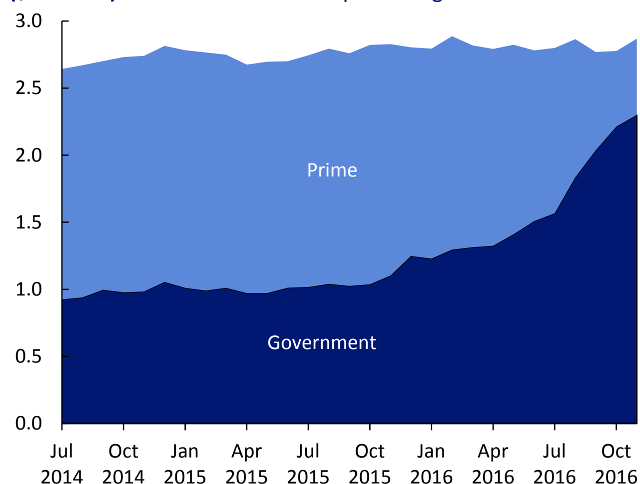
Before the reform, fund flows also caused an increase in private short-term borrowing costs, as discussed in the previous Financial Markets Monitor. The LIBOR-OIS spread, an important gauge of the relative cost of banks to borrow, stopped increasing when the reform was implemented and has since receded somewhat (see Figure 7). LIBOR stands for London Interbank Offered Rate. OIS stands for Overnight Indexed Swap. LIBOR-OIS is the difference between the three-month LIBOR and OIS rates. OIS rates indicate what the market expects for future central bank interest rates.

Figure 5: Overnight interest rates (percent)
Effective federal funds rate traded within new target range



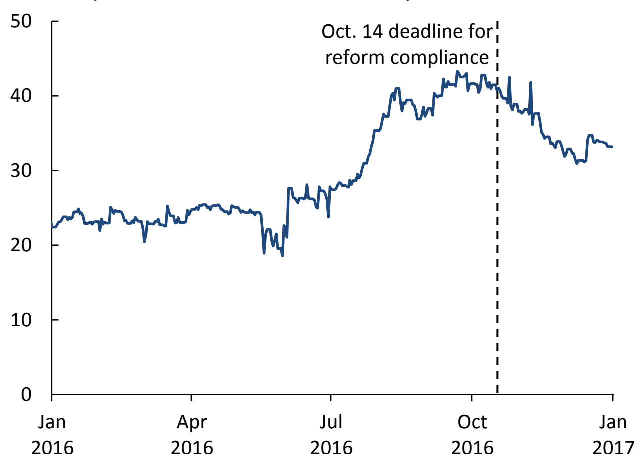
Source: Bloomberg L.P.

Figure 6: Assets under management in money market funds ($ trillions) Investors shifted from prime to government funds



Note: Tax-exempt assets excluded.
Sources: SEC Form N-MFP, OFR analysis

Figure 7: 3-month LIBOR-OIS spread (basis points)
LIBOR-OIS spread has narrowed after money market reform



Source: Bloomberg L.P.

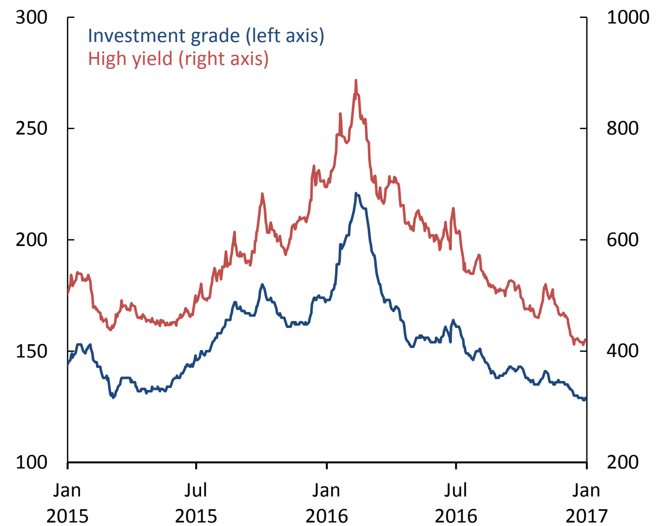
as a key potential threat to financial stability (see the OFR *2016 Financial Stability Report*).

China and other emerging markets had sizable capital outflows.

Emerging market assets sold off sharply in the days after the U.S. election. Capital outflows from funds that invest in emerging market debt were the heaviest since at least 2004. Emerging market currencies depreciated by more than 4 percent during the election week. China had especially sharp capital outflows in the fourth quarter, and its currency depreciated more than 4 percent against the U.S. dollar. Capital outflows have reduced China's official foreign reserves by 25 percent since 2014 (see Figure 15).

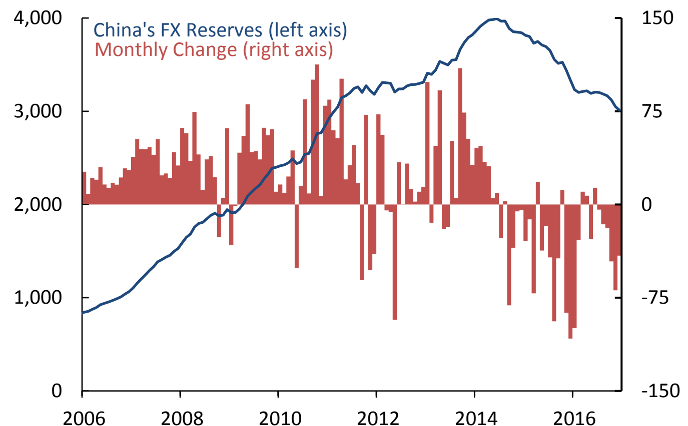
Also in China, tighter monetary conditions caused investors to pull cash from wealth management products, a type of off-balance-sheet investment vehicle used by Chinese financial institutions. A rout ensued in the $8 trillion domestic bond market in which wealth management products are heavily invested. Since August, when the People's Bank of China signaled its desire to rein in credit growth, the yield on 10-year Chinese government bonds has climbed 40 basis points. China and other large emerging markets face considerable challenges to financial stability amid lower growth, capital outflows, and a large overhang of private sector debt. In a severely adverse scenario, financial instability in these large emerging markets could spill over to the United States (see the OFR *2015 Financial Stability Report*).

Figure 14: U.S. corporate bond option-adjusted spreads (basis points) Corporate bond spreads continued to decline



Source: Haver Analytics

Figure 15: Chinese foreign exchange reserves ($ billions)
Renewed reserve declines in the fourth quarter



Source: Bloomberg L.P.

Selected Global Asset Price Developments

	LEVEL (12/31/2016)	1Q CHANGE (bps or %)	1Q CHANGE (standard deviations)*	YTD CHANGE (bps or %)	12-MONTH RANGE**
EQUITIES					
S&P 500	2239	3.3%	0.2	10	
U.S. KBW Bank Index	92	29.6%	2.2	26	
Russell 2000	1357	8.4%	0.6	19	
Nasdaq	5383	1.3%	-0.1	8	
Euro Stoxx 50	3291	9.6%	0.8	1	
Shanghai Composite	3104	3.3%	0.0	-12	
Nikkei 225	19114	16.2%	1.4	0	
Hang Seng	22001	-5.6%	-0.6	0	
FTSE All World	279	1.0%	-0.1	6	
RATES					
U.S. 2-Year Yield	1.19%	43	0.9	14	
U.S. 2-Year Swap Rate	1.45%	44	0.8	27	
U.S. 10-Year Yield	2.44%	85	1.7	17	
U.S. 10-Year Swap Rate	2.34%	88	1.7	15	
U.S. 30-Year Yield	3.07%	75	1.7	5	
U.S. 2y10y Spread	125	42	1.3	3	
U.S. 5Y5Y Inflation Breakeven	2.05%	27	0.6	24	
U.S. 5Y5Y Forward Rate	3.05%	94	1.8	17	
Germany 10-Year Yield	0.21%	33	1.0	-42	
Japan 10-Year Yield	0.05%	14	0.6	-22	
U.K. 10-Year Yield	1.24%	49	1.2	-72	
JPM EMU Periphery Yield	1.68%	49	1.3	1	
Euro area 5Y5Y Inflation Breakeven	1.74%	39	2.5	6	
FUNDING					
1M T-Bill Yield	0.42%	23	0.7	29	
DTCC GCF Treasury Repo	0.47%	-80	-3.8	-17	
3M Libor	1.00%	14	0.3	39	
Libor-OIS Spread	33	-8	-0.3	10	
EURUSD 3M CCY Basis Swap	-55	0.2	0.0	-37	
U.S. MBS					
FNMA Current Coupon	3.13%	77	1.7	13	
FHLMC Primary Rate	4.32%	90	2.2	31	
CREDIT					
CDX Investment Grade 5-Year CDS Spread	67	-8	-0.4	-21	
CDX High Yield 5-Year CDS Spread	356	-45	-0.2	-117	
CDX Itraxx Euro 5-Year CDS Spread	72	0	0.0	-5	
IMPLIED VOLATILITY					
VIX Index	14	6%	0.0	-23	
V2X Index	18	-8%	-0.4	-18	
VDAX Index	18	-5%	-0.3	-21	
MOVE Index	72	18%	0.8	6	
3M2Y Swaption Volatility	55	11%	0.3	-2	
3M10Y Swaption Volatility	84	20%	1.0	14	
DB G10 FX Volatility Index	11	14%	0.7	17	
JPM EMFX Volatility Index	11	8%	0.2	-1	
FOREIGN EXCHANGE & COMMODITIES					
U.S. Dollar Index***	102	7.1%	1.7	4	
EUR/USD	1.05	-6.4%	-1.3	-3	
USD/JPY	117	15.4%	2.4	-3	
GBP/USD	1.23	-4.9%	-1.1	-16	
USD/CHF	1.02	4.9%	1.0	2	
Brent Crude	57	15.8%	0.7	52	
Gold	1148	-12.8%	-2.1	8	
S&P GSCI Commodities Index	398	9.3%	0.6	28	
EMERGING MARKETS					
JPM EMFX Index	66	-3.6%	-0.7	1	
MSCI Emerging Market Equity Index	862	-4.6%	-0.5	9	
CDX EM 5-Year CDS Spread	242	4.9	0.0	-117	

* Standard deviations based on quarterly data from January 1994 or earliest available thereafter.
** Trailing 12-month range. Latest (O); Mean (|).
*** Dollar index from Bloomberg (ticker: DXY); averages the exchange rates between the U.S. dollar and major world currencies.
Sources: Bloomberg L.P., OFR analysis