

## Rising Confidence Lifts the U.S. Bull Market into its Eighth Year

The bull market in U.S. stocks extended into its eighth year as major U.S. equity indexes rose during the first quarter, supported by an upswing in confidence, solid corporate earnings, and the expectation of faster U.S. economic growth (see Figure 1). Equity market volatility and corporate bond spreads fell to near cyclical lows but stock valuations remained elevated. As discussed in the [OFR's 2016 Financial Stability Report](#), the pattern of recent years — periods of calm interrupted by bouts of turbulence — suggests confidence can be overdone for some time before investors broadly reassess risks.

**Figure 1: Equity Prices and Confidence (index, z-score)**

An upswing in confidence lifted equity prices to new highs



Note: Z-score represents the distance from the average expressed in standard deviations, calculated using data since Jan. 1, 1994.

Sources: Federal Reserve Bank of Philadelphia, Bloomberg Finance L.P., OFR analysis

### Key developments in the first quarter of 2017

- Prices of risk assets generally appreciated as the bull market in U.S. equities started its eighth year. The bull market is supported by rising confidence, better-than-expected corporate earnings, and upbeat U.S. economic data.
- Corporate bond spreads tightened to near cyclical lows. Equity market implied volatility fell to a 10-year low.
- The Federal Open Market Committee (FOMC) raised short-term interest rates by 25 basis points in March, as expected. FOMC members projected two more rate hikes in 2017.
- In China, capital controls reduced capital outflows as official reserves increased. The currency appreciated against the U.S. dollar.

## Bull market in U.S. equities turned eight years old.

The U.S. benchmark equity index, the S&P 500, has risen 249 percent from its low on March 9, 2009, making this the second-longest bull market in U.S. history (see Figure 2). During the first quarter of 2017, the S&P 500 rose 5.5 percent. Stocks were supported by rising consumer and business confidence in the United States, which was reinforced by better-than-expected corporate earnings and economic data.

The upward trend in business confidence since the U.S. election coincided with robust fourth-quarter earnings. Adjusted earnings of S&P 500 companies grew 6 percent year-over-year, while sales grew 5 percent. Consensus estimates call for strong corporate earnings growth of about 11 percent in 2017.

The corporate earnings outlook has supported rising stock valuations. By several key measures, U.S. stock valuations are elevated compared with historical levels (see Figure 3). Valuations are sensitive to changes in the U.S. corporate tax rate. All else equal, price-earnings multiples would be expected to rise if corporate tax rates were to decrease as part of an overhaul of the U.S. tax code.

Volatility in equity markets, both implied and realized, fell to historically low levels during the first quarter. The S&P 500 had its longest streak without a 1 percent downward daily price move since 1995. The Chicago Board Options Exchange Volatility Index (VIX®), a gauge of S&P 500 implied volatility, fell below 10 during intraday trading in February, near its all-time low close of 9.3, set in 1993.

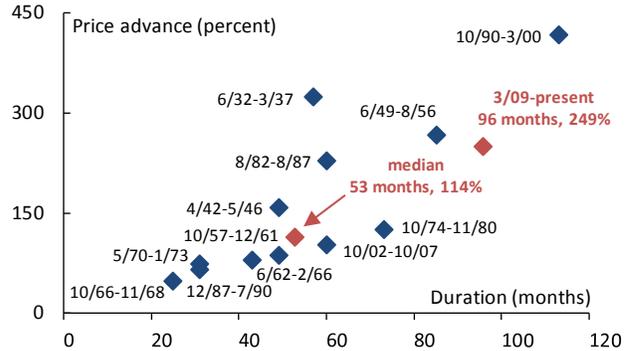
## Corporate bond spreads fell to near cyclical lows.

Extremely low volatility in the equity market has coincided with tightened spreads in the corporate bond market. Option-adjusted spreads on investment-grade corporate bonds tightened by 6 basis points to 124 basis points. High-yield corporate bond spreads fell by 30 basis points to 392 basis points, near the lowest since the financial crisis (see Figure 4).

Increased appetite for products that offer a spread to Treasuries has led investors to demand less compensation for credit risk, even though defaults among speculative-grade nonfinancial corporate issues are at a post-2010 high (see Figure 5). As discussed in the [OFR's 2016 Financial Stability Report](#), the combination of narrow

**Figure 2: S&P 500 bull market runs**

The current bull market is the second longest in U.S. history



**Figure 3: U.S. stock valuations**

Key valuation metrics are high

Metric	Current	Historical percentile
Cyclically adjusted price-to-earnings (P/E)	30x	97%
Q-ratio	100%	88%
Buffett Indicator	132%	92%
Trailing P/E	21.8x	87%
Forward P/E	18.2x	83%
Price-to-book	3.1x	77%

Note: Percentiles are based on historical data beginning in 1881, 1951, 1970, 1954, 1990, and 1990 respectively.

Sources: Bloomberg Finance L.P., Haver Analytics, OFR analysis

**Figure 4: U.S. corporate bond spreads (basis points)**

Corporate bond spreads tested cyclical lows



Note: Spreads are option-adjusted.

Source: Haver Analytics

corporate bond spreads and high equity valuations could make U.S. financial markets more vulnerable to shocks.

**The Federal Reserve raised rates for the second time in three months.**

The Federal Reserve’s FOMC voted to raise its target for short-term interest rates by 25 basis points at its March meeting. In its statement, the FOMC stressed a continuing gradual approach to monetary tightening. The rate hike was in line with market expectations.

The effective federal funds rate quickly adjusted to trade within its new target range of 0.75 percent to 1 percent (see Figure 6). 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 two more rate hikes, totaling 50 basis points, in 2017.

**Short-term funding costs stabilized as banks adjusted to money market fund reform.**

The reform of U.S. money market funds in October 2016 dampened risk appetite among short-term investors, leading to generally higher borrowing costs for banks (see the December 2016 [Financial Markets Monitor](#)). In the first quarter, the relative cost for banks to borrow fell back to the level that prevailed before the reform.

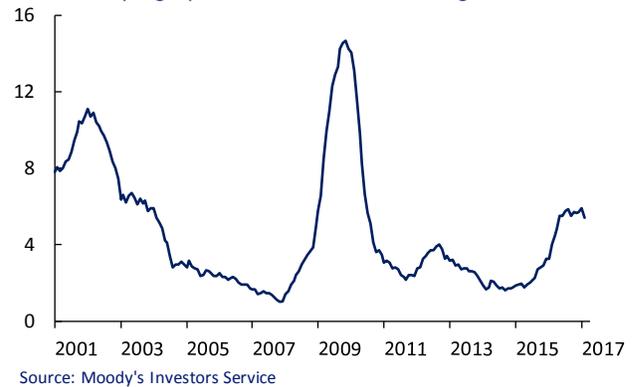
The three-month LIBOR-OIS spread, an important gauge of the relative cost of banks to borrow, stopped increasing when the reform took effect. The spread later declined. Short-dated cross-currency basis swap spreads, a measure of the cost to convert foreign currency borrowing into U.S. dollars, also narrowed after the reform (see Figure 7). Overall, this meant that borrowing U.S. dollars cost less for foreign firms.

Data from the OFR’s [U.S. Money Market Fund Monitor](#) demonstrate that some foreign banks have adapted to changes in money markets in part by shifting their borrowing to repurchase agreements.

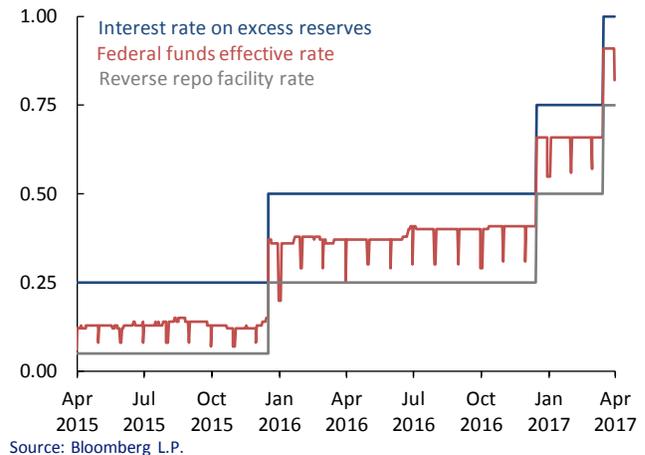
**Foreign investors’ demand for Treasuries helped hold down long-term interest rates.**

U.S. long-term interest rates were range-bound for most of the first quarter. The yield on U.S. 10-year Treasuries fell 6 basis points to 2.4 percent. Breakeven inflation

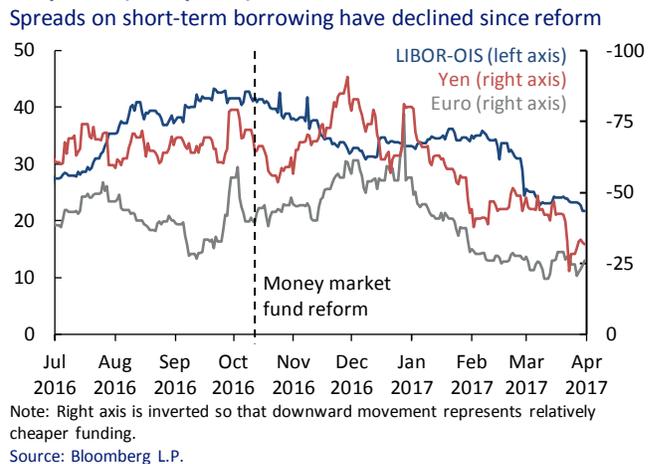
**Figure 5: Trailing 12-month U.S. nonfinancial corporate speculative-grade default rate on bonds and loans (percent)**  
 Defaults by high-yield bond issuers are the highest since 2010



**Figure 6: Overnight interest rates (percent)**  
 The effective federal funds rate traded within its new target range



**Figure 7: 3-month LIBOR-OIS spread and cross-currency basis swap rates (basis points)**  
 Spreads on short-term borrowing have declined since reform



compensation, the difference between the nominal yield of a Treasury bond and the real yield of a Treasury inflation-protected security of similar maturity, held steady at 2 percent. Actual inflation has been rising. U.S. Consumer Price Index inflation at the end of February was 2.7 percent year-over-year, the highest since 2012. Real rates remained below their peak in December (see Figure 8).

A key driver of the rise in U.S. long-term interest rates from all-time lows in July 2016 has been an increase in the term premium. The term premium is the excess yield that investors demand for holding long-term Treasuries rather than a series of short-maturity government obligations. During the first quarter, the 10-year Treasury term premium fell and turned negative for the first time since the U.S. election (see Figure 9).

One factor pushing down the term premium on Treasuries is foreign demand, especially from European investors seeking the safety and attractive yield of Treasuries. The yield spread between 10-year Treasuries and German government bonds of a similar maturity is 2 percent, near the widest since 1989.

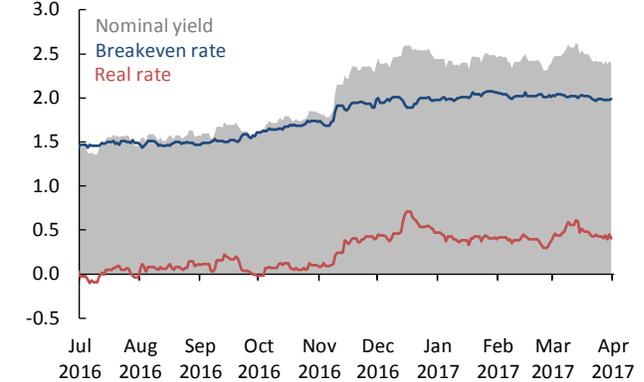
**Political events influenced major foreign economies.**

Political uncertainty related to European elections caused long-term interest rates to diverge in the eurozone during the first quarter. Yields on French bonds traded 64 basis points higher than the German benchmark, the widest spread since 2014 (see Figure 10).

Investors sold off French bonds as uncertainty grew about presidential elections, to be held in two rounds on April 23 and May 7. The rhetoric of the campaign has weighed upon French bonds as one party has proposed that France exit the euro currency area, resulting in a return of the French franc and a redenomination of French national debt.

On March 29, the United Kingdom (U.K.) government triggered Article 50 of the Lisbon treaty, the formal process to exit the European Union (EU). This begins a two-year timeframe for the U.K. and EU to negotiate an orderly exit before the split actually occurs in March 2019. Financial markets reacted calmly to the well-anticipated event. The British pound strengthened 1.6 percent against the U.S. dollar during the first quarter.

**Figure 8: U.S. 10-year Treasury yield (percent)**  
Real interest rates have fallen since their December peak



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 9: Ten-year Treasury yield and term premium (percent)**  
The term premium fell back below zero during the first quarter



Note: Term premium is Adrian, Crump, Moench model. Source: Bloomberg L.P.

**Figure 10: French to German 10-year bond yield spread (percent)**  
French bonds sold off before elections in April and May



Source: Bloomberg L.P.

## Crude oil prices fell despite a production cut by exporters.

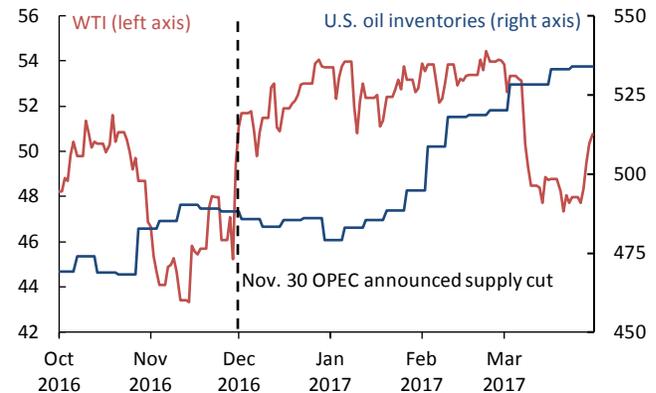
The U.S. benchmark price for crude oil fell more than 5 percent to under \$51 a barrel during the first quarter (see Figure 11). Growing U.S. oil inventories indicated that efforts to reduce the supply of oil had not ended the global oil glut. Production cuts by the Organization of the Petroleum Exporting Countries have been partially offset by rapidly expanding U.S. shale oil production. U.S. producers have offset about one-fourth of the 1.8 million barrels that major oil exporters pledged to cut last November.

## Capital outflow pressures moderated in China.

In February, China's official reserves rose by \$6.2 billion, the first monthly increase in eight months (see Figure 12). Since 2014, persistent capital outflows and the need to support its currency have cost China nearly \$1 trillion in reserves. Chinese officials have sought to reduce this cost and stem capital outflows by imposing capital controls.

Since late last year, moving capital out of China has become more difficult because of enhanced scrutiny of overseas acquisitions and restrictions on the international remittance of China's currency. In a sign that capital controls may be having their intended effect, China's currency appreciated by 0.8 percent against the U.S. dollar during the first quarter.

**Figure 11: Crude oil price and inventories (\$, millions of barrels)**  
Oil prices fell as U.S. inventories rose, despite OPEC supply cut



Note: OPEC stands for Organization of the Petroleum Exporting Countries. WTI stands for West Texas Intermediate, the U.S. benchmark for oil prices.  
Source: Bloomberg L.P.

**Figure 12: Chinese foreign exchange reserves (\$ billions)**

Reserves increased for the first time in eight months



Source: Bloomberg L.P.

## Selected Global Asset Price Developments

	LEVEL (3/31/2017)	1Q CHANGE (bps or %)	1Q CHANGE (standard deviations)*	YTD CHANGE (bps or %)	12-MONTH RANGE**
<b>EQUITIES</b>					
S&P 500	2363	5.5%	0.4	6	
U.S. KBW Bank Index	92	0.3%	-0.1	0	
Russell 2000	1386	2.1%	0.0	2	
Nasdaq	5912	9.8%	0.5	10	
Euro Stoxx 50	3501	6.4%	0.5	6	
Shanghai Composite	3223	3.8%	0.0	4	
Nikkei 225	18909	-1.1%	-0.2	-1	
Hang Seng	24112	9.6%	0.7	10	
FTSE All World	297	6.4%	0.6	6	
<b>RATES</b>					
U.S. 2-Year Yield	1.25%	7	0.2	7	
U.S. 2-Year Swap Rate	1.62%	17	0.3	17	
U.S. 10-Year Yield	2.39%	-6	0.0	-6	
U.S. 10-Year Swap Rate	2.38%	5	0.2	5	
U.S. 30-Year Yield	3.01%	-6	0.0	-6	
U.S. 2y10y Spread	113	-12	-0.4	-12	
U.S. 5Y5Y Inflation Breakeven	2.12%	7	0.2	7	
U.S. 5Y5Y Forward Rate	2.94%	-11	-0.1	-11	
Germany 10-Year Yield	0.33%	12	0.5	12	
France 10-Year Yield	0.97%	28	0.9	28	
Japan 10-Year Yield	0.07%	2	0.2	2	
U.K. 10-Year Yield	1.14%	-10	-0.1	-10	
JPM EMU Periphery Yield	1.96%	28	0.8	28	
Euro area 5Y5Y Inflation Breakeven	1.56%	-18	-1.0	-18	
<b>FUNDING</b>					
1M T-Bill Yield	0.73%	31	0.9	31	
DTCC GCF Treasury Repo	1.03%	55	2.2	55	
3M Libor	1.15%	15	0.3	15	
Libor-OIS Spread	22	-12	-0.4	-12	
EURUSD 3M CCY Basis Swap	-26	29.2	0.7	29	
<b>U.S. MBS</b>					
FNMA Current Coupon	3.13%	0	0.1	0	
FHLMC Primary Rate	4.14%	-18	-0.4	-18	
<b>CREDIT</b>					
CDX Investment Grade 5-Year CDS Spread	67	-1	-0.1	-1	
CDX High Yield 5-Year CDS Spread	338	-18	-0.1	-18	
<b>IMPLIED VOLATILITY</b>					
VIX Index	12	-12%	-0.5	-12	
V2X Index	17	-9%	-0.4	-9	
VDAX Index	15	-16%	-0.6	-16	
MOVE Index	61	-15%	-0.8	-15	
3M2Y Swaption Volatility	47	-14%	-0.6	-14	
3M10Y Swaption Volatility	70	-17%	-1.0	-17	
DB G10 FX Volatility Index	9	-19%	-1.1	-19	
JPM EMFX Volatility Index	9	-20%	-0.9	-20	
<b>FOREIGN EXCHANGE &amp; COMMODITIES</b>					
U.S. Dollar Index***	100	-1.8%	-0.5	-2	
EUR/USD	1.07	1.3%	0.2	1	
USD/JPY	111	-4.8%	-0.8	-5	
GBP/USD	1.26	1.7%	0.4	2	
USD/CNY	6.89	-0.8%	-0.2	-1	
USD/CHF	1.00	-1.6%	-0.3	-2	
WTI Crude	51	-5.8%	-0.5	-6	
Gold	1249	8.9%	1.1	9	
S&P GSCI Commodities Index	388	-2.5%	-0.4	-3	
<b>EMERGING MARKETS</b>					
JPM EMFX Index	68	3.3%	1.0	3	
MSCI Emerging Market Equity Index	958	11.1%	0.8	11	
CDX EM 5-Year CDS Spread	214	-28.4	-0.4	-28	

\* Standard deviations based on quarterly data from January 1994 or earliest available thereafter.

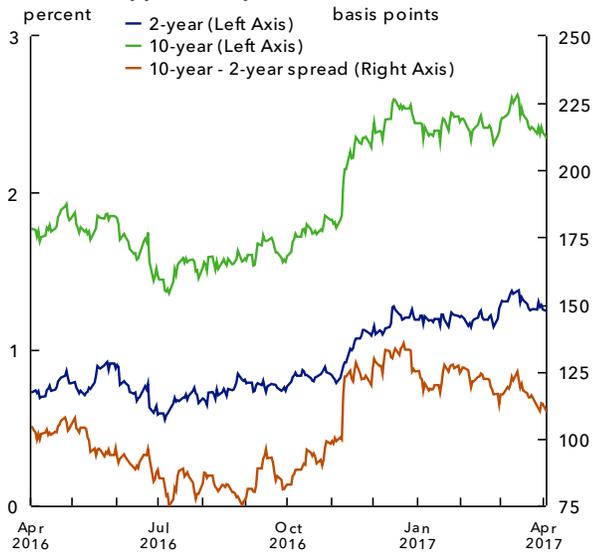
\*\* Trailing 12-month range. Latest (O); Mean ( | ).

\*\*\* Dollar index from Bloomberg (ticker: DXY); averages the exchange rates between the U.S. dollar and major world currencies.

Sources: Bloomberg Finance L.P., OFR analysis

# Select U.S. Interest Rates

## U.S. Treasury yields and yield curve



Source: Bloomberg Finance L.P.

## U.S. Treasury term premium (basis points)



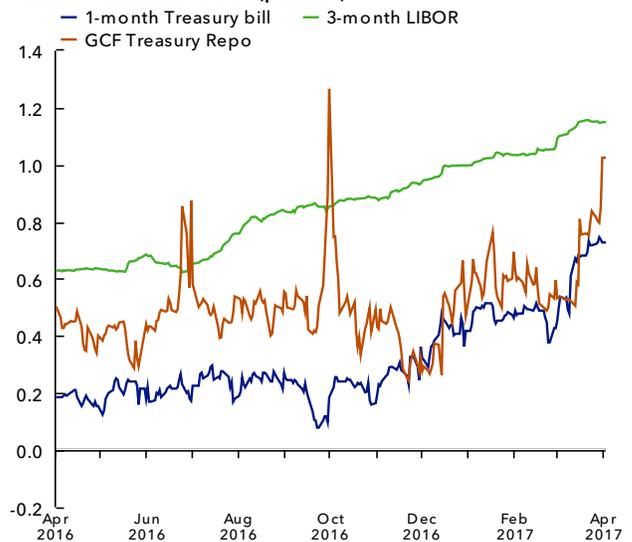
Note: Adrian, Crump, & Moench model  
Source: Bloomberg Finance L.P.

## Professional vs. market-implied U.S. inflation expectations (percent)



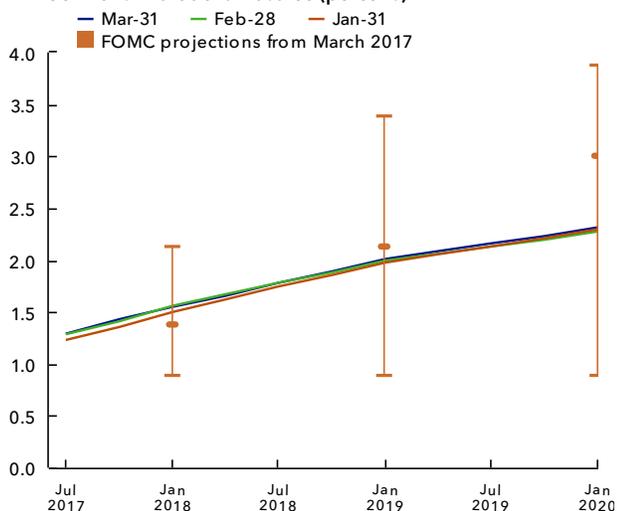
Source: Bloomberg Finance L.P.

## Short-term market rates (percent)



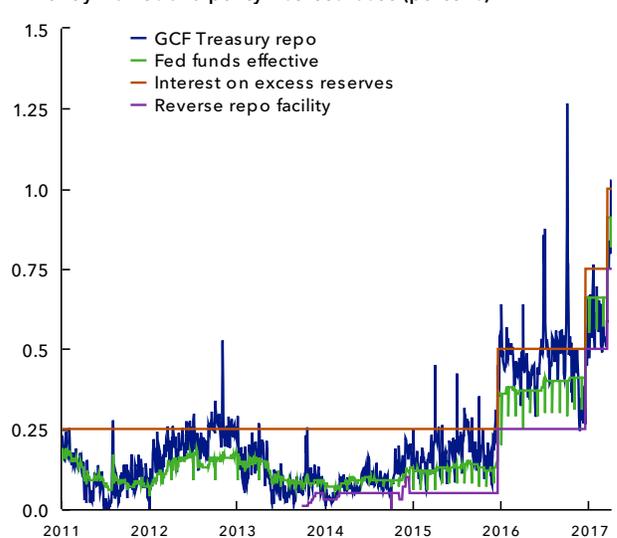
Source: Bloomberg Finance L.P.

## Three-month Eurodollar futures (percent)



Notes: The high and low points of the Dec FOMC projections are the maximum and minimum forecasts. The rectangle represents the median.  
Source: Bloomberg Finance L.P.

## Money market and policy interest rates (percent)



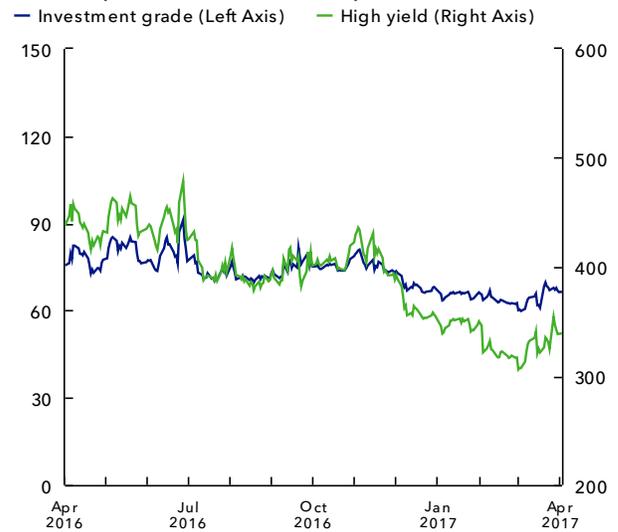
Source: Bloomberg Finance L.P.

**U.S. corporate bond option-adjusted spreads (basis points)**



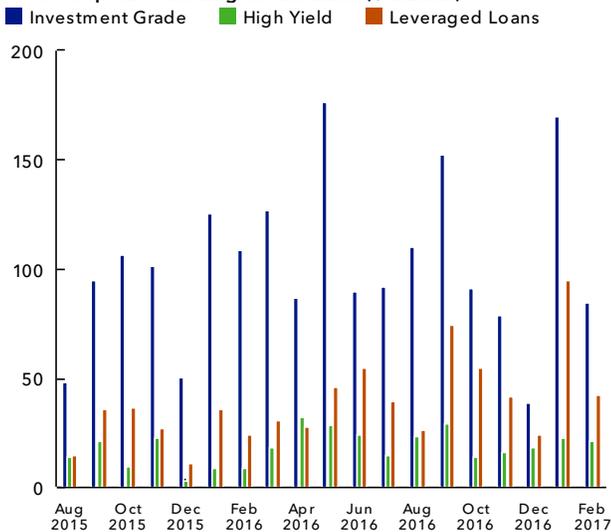
Source: Haver Analytics

**U.S. corporate CDS indexes (basis points)**



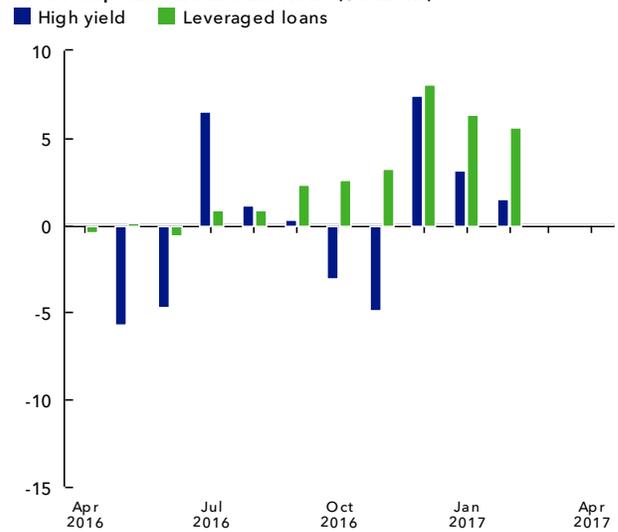
Note: Five-year maturity CDS Index  
Source: Bloomberg Finance L.P.

**U.S. corporate credit gross issuance (\$ billions)**



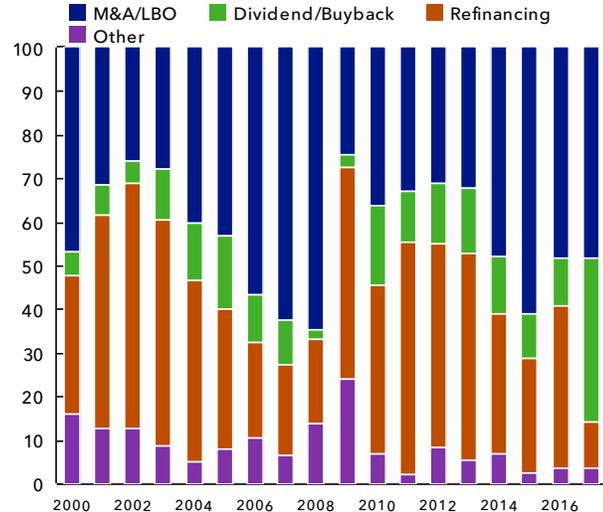
Sources: Securities Industry and Financial Markets Association, Standard & Poor's Leveraged Commentary & Data

**U.S. corporate credit fund flows (\$ billions)**



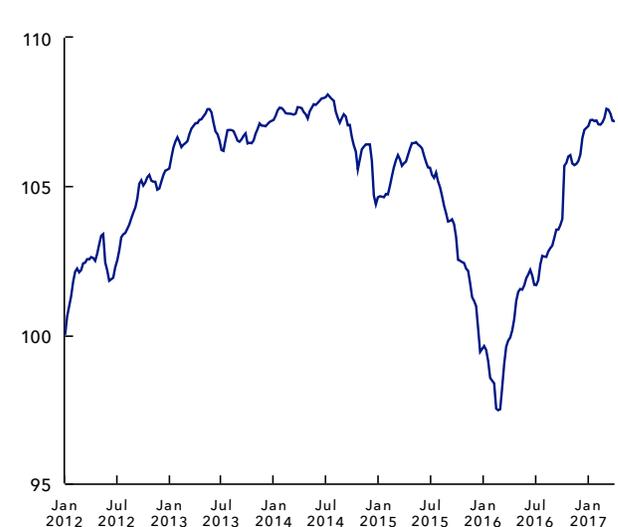
Note: Flows data are released with one-month lag.  
Source: Haver Analytics

**Leveraged loan issuance by use of proceeds (percent)**



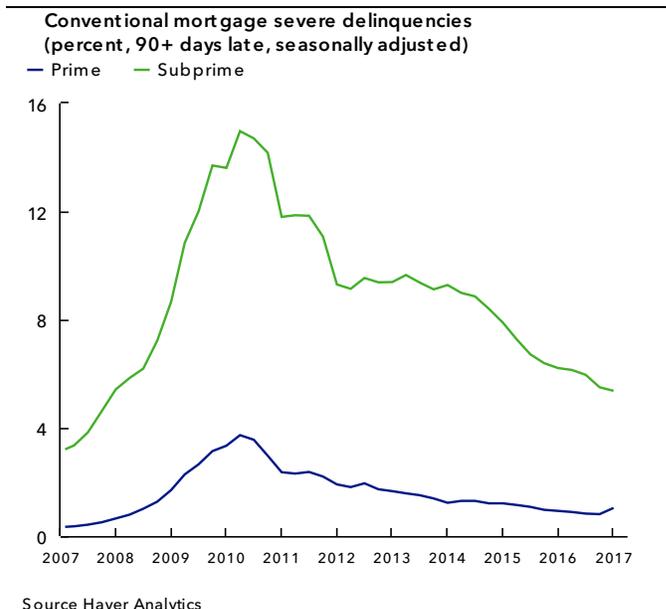
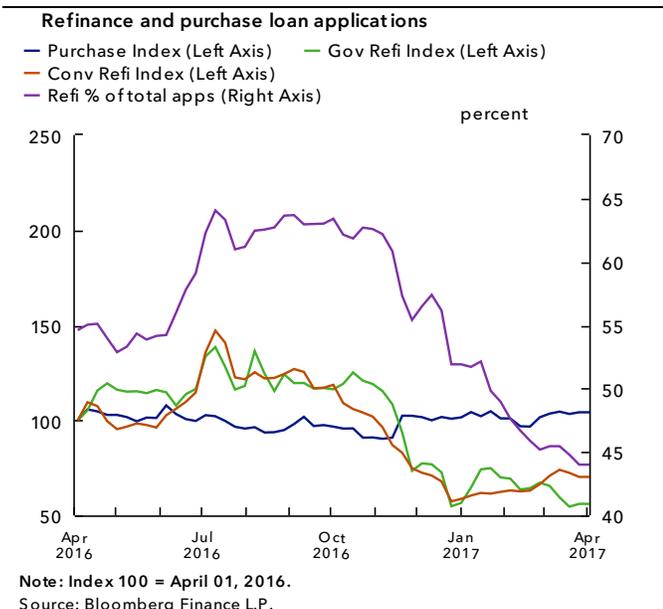
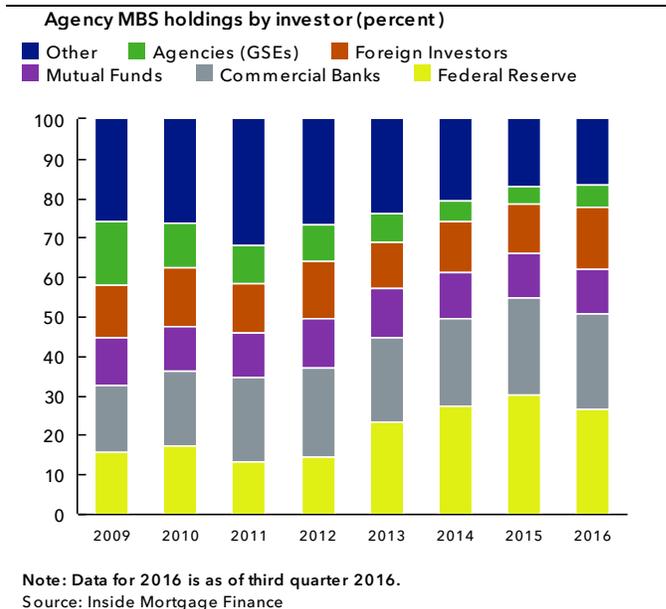
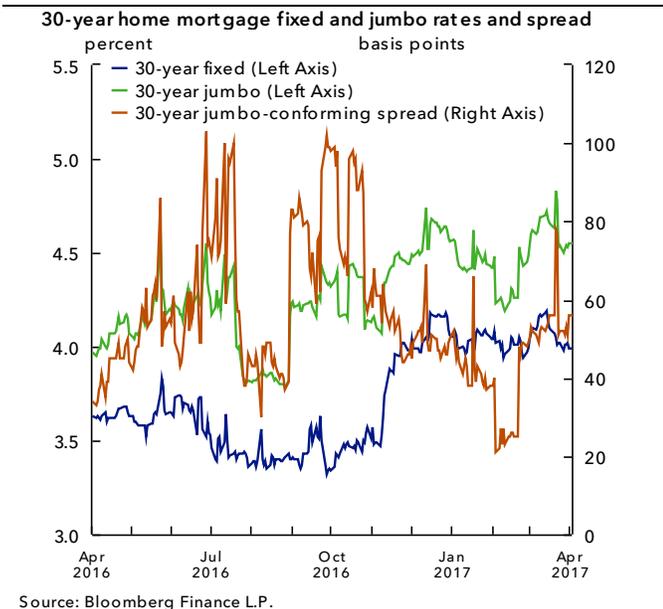
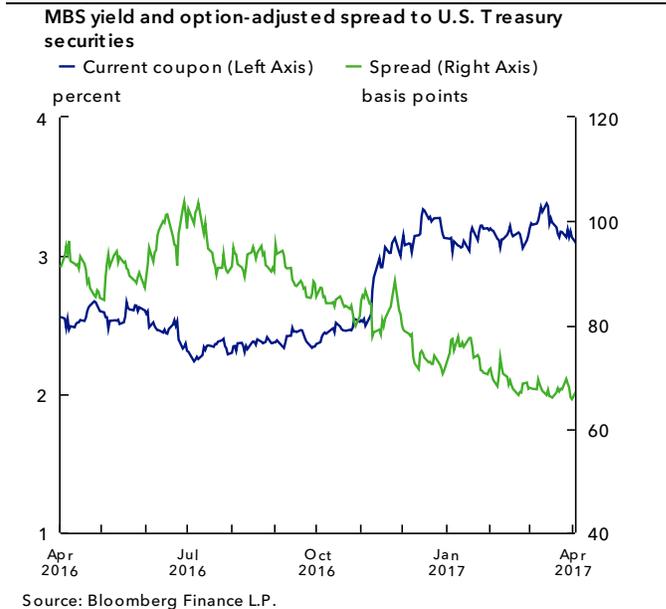
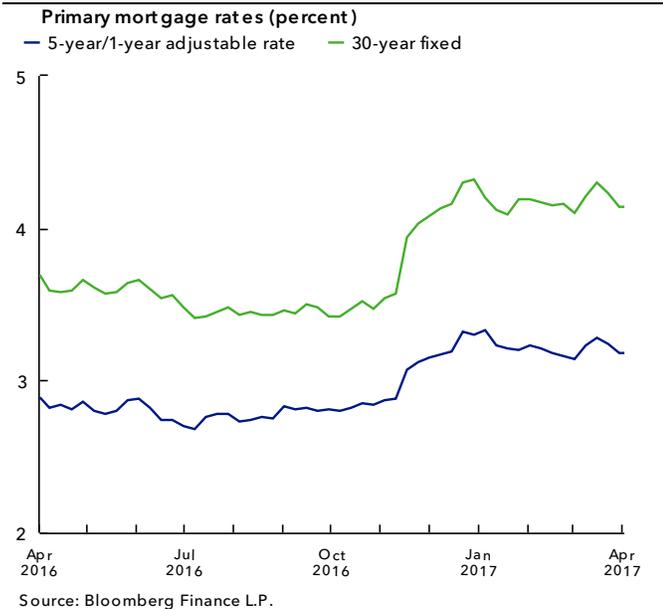
Note: Data for 2017 are year-to-date as of January.  
Sources: Standard & Poor's Leveraged Commentary & Data, OFR analysis

**Leveraged loan price activity**

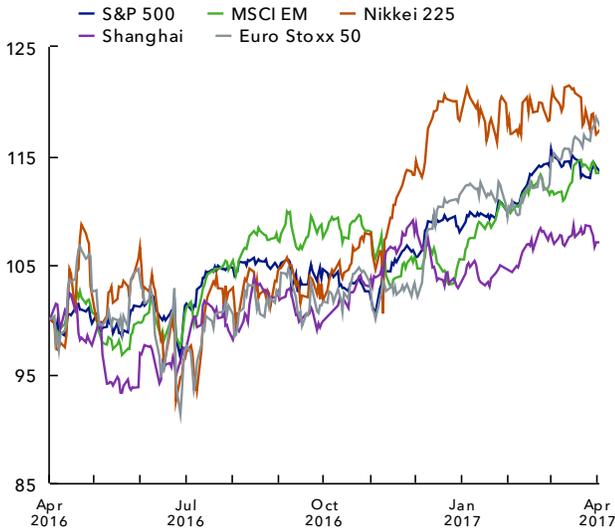


Notes: S&P Leveraged Loan Index. Index 100=January 01, 2012.  
Source: Bloomberg Finance L.P.

# Primary and Secondary Mortgage Markets

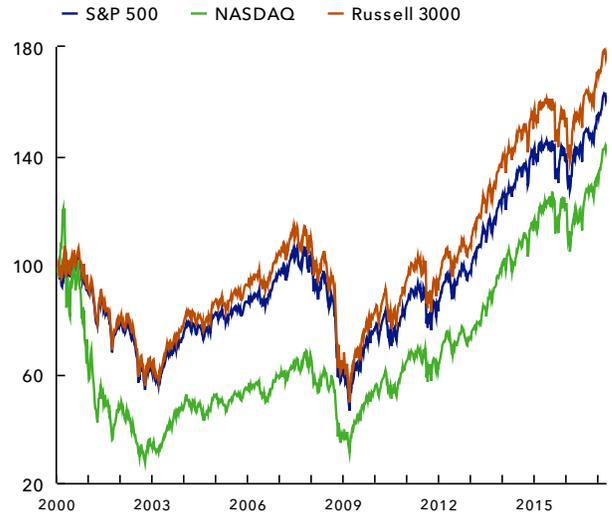


Global equity indices



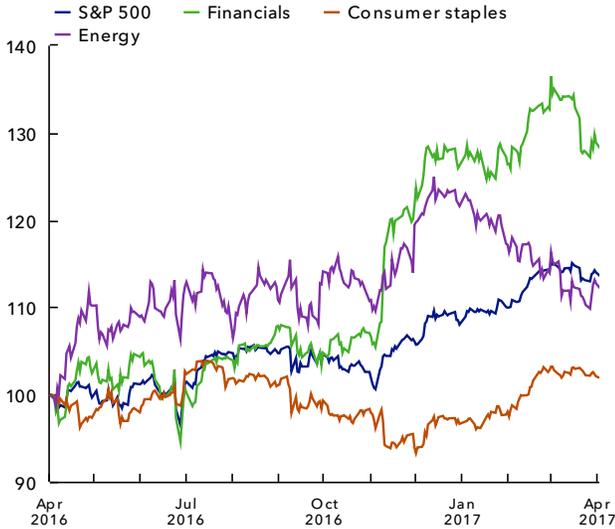
Note: Index = April 01, 2016.  
Source: Bloomberg Finance L.P.

U.S. equity indexes



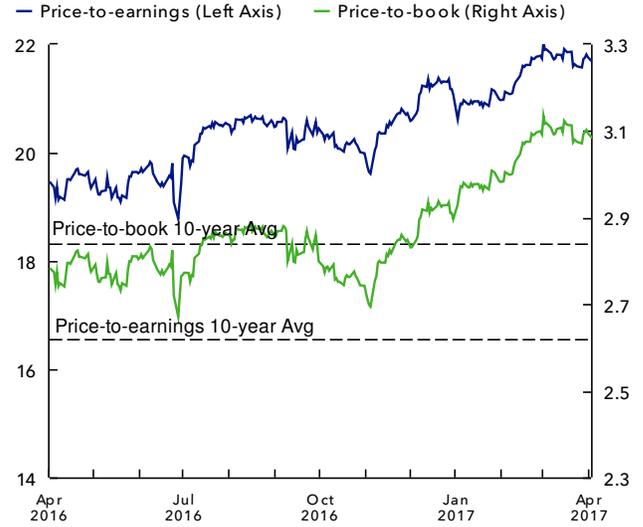
Note: Index 100 = Jan 01, 2000.  
Source: Bloomberg Finance L.P.

S&P 500 sector performance



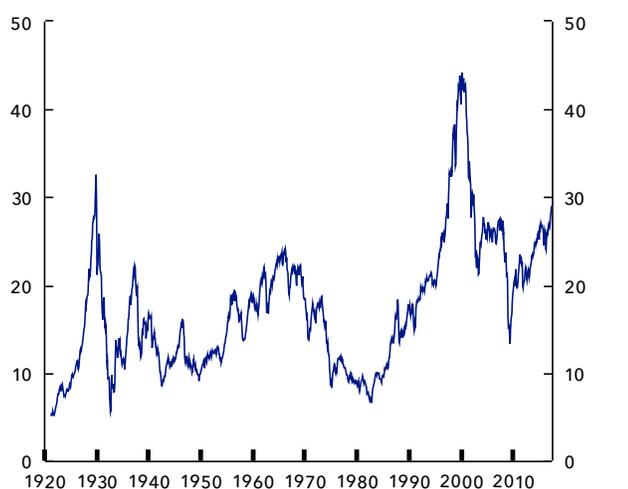
Note: Index 100 = April 01, 2016.  
Source: Bloomberg Finance L.P.

S&P 500 price-to-earnings and price-to-book ratios (multiple)



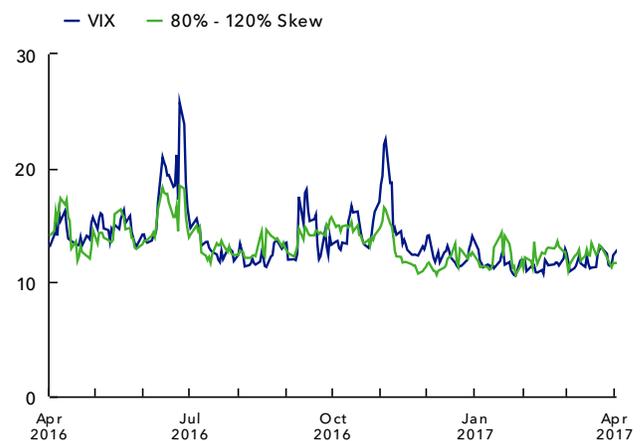
Source: Bloomberg Finance L.P.

S&P 500 cyclically adjusted price-to-earnings (CAPE) ratio



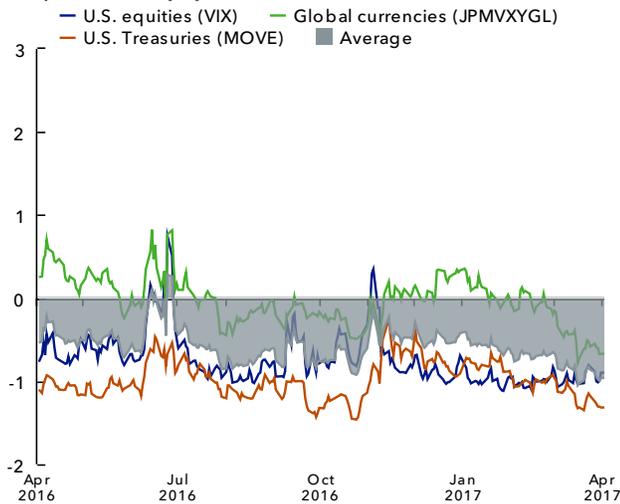
Note: CAPE is the ratio of the monthly S&P 500 price level to trailing ten-year average earnings (inflation adjusted).  
Sources: Haver Analytics, OFR analysis

S&P 500 implied volatility and option skew (percent)



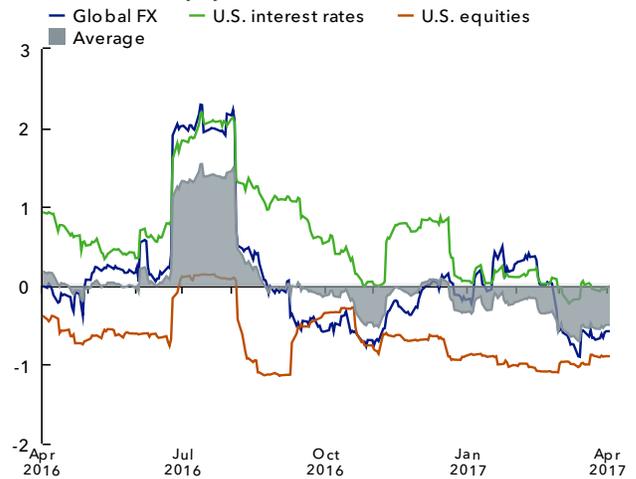
Notes: Option skew is the difference between three-month implied volatility of out of the money puts and calls with strikes equal distance from the spot price (+/- 20 percent). Higher values reflect greater demand for downside risk protection.  
Source: Bloomberg Finance L.P.

Implied volatility by asset class (Z-score)



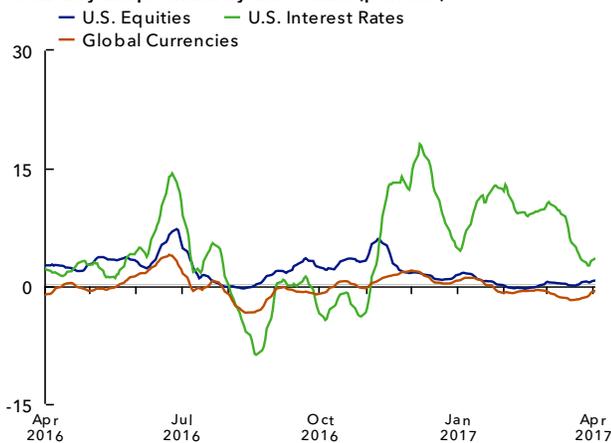
Notes: Z-score represents the distance from the average, expressed in standard deviations. Standardization uses data going back to January 01, 1993. Sources: Bloomberg Finance L.P., OFR analysis

Realized volatility by asset class (Z-score)



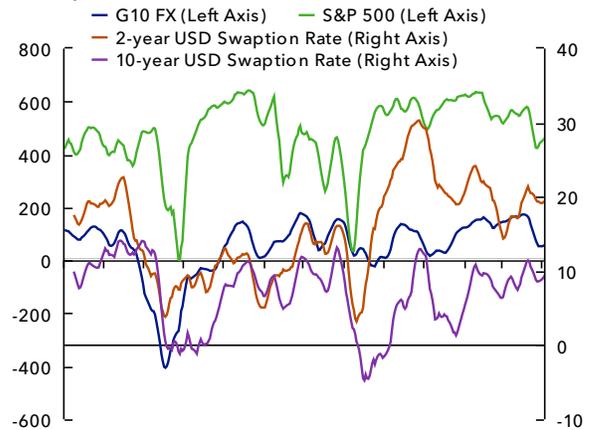
Notes: Thirty-day realized volatility. Equities based on S&P 500 index, interest rates based on weighted average of T treasury yield curve, FX based on weights from JPMVXY index. Standardization uses data going back to January 01, 1993. Sources: Bloomberg Finance L.P., OFR analysis

Volatility risk premium by asset class (percent)



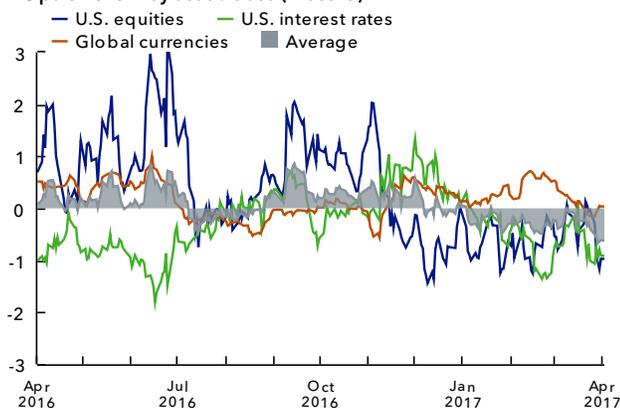
Notes: One-month option-implied volatility minus one-month model-predicted volatility. The latter is computed based on realized volatility, using a hetero-autoregressive model with 1, 5, and 22 day lags. U.S. Interest Rates represents the average volatility risk premium of two- and ten-year swap rates. Equities based on S&P 500 index. Currencies based on weights from JPMVXYGL Index. Sources: Bloomberg Finance L.P., OFR analysis

Slopes of implied volatility curves (basis points)



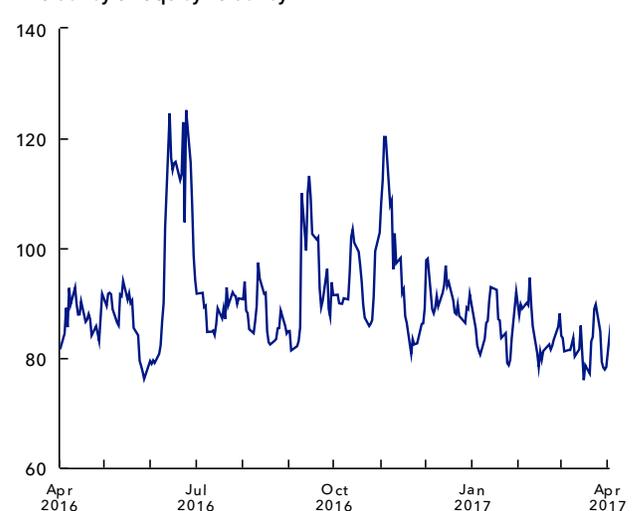
Notes: Seven-day moving average. Slope represents difference between one-year and one-month maturities. G10 FX based on weights from Deutsche Bank's CVIX index. Sources: Bloomberg Finance L.P., OFR analysis

Option skew by asset class (z-score)

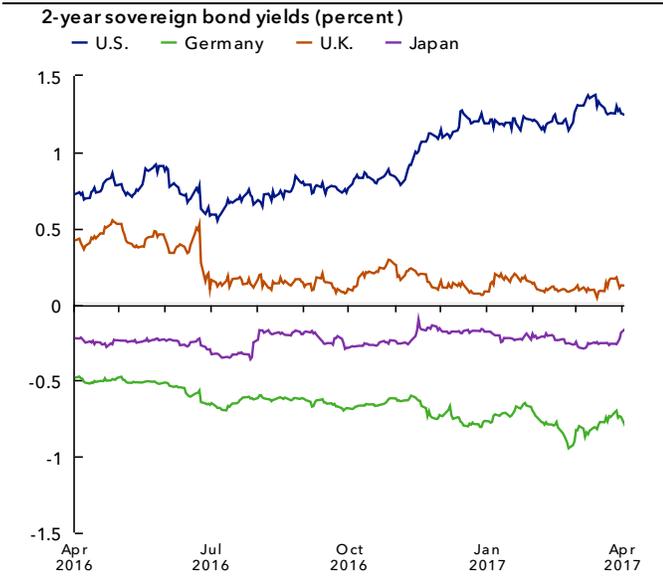


Notes: Option skew is the difference between three-month implied volatility of out of the money puts and calls with strikes equal distance from the spot price (+/- 10 percent). Higher values reflect greater demand for downside risk protection. Equities represents S&P500 index. Interest rates represent weighted average skew of T treasury futures curve. Currencies represent dollar skew against major currencies based on JPMVXY index weights. Z-score standardization uses data going back to January 01, 2006. Sources: Bloomberg Finance L.P., OFR analysis

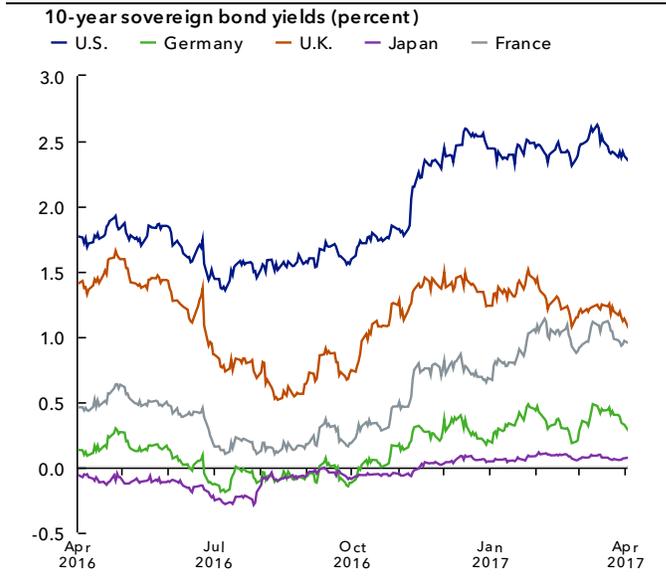
Volatility of equity volatility



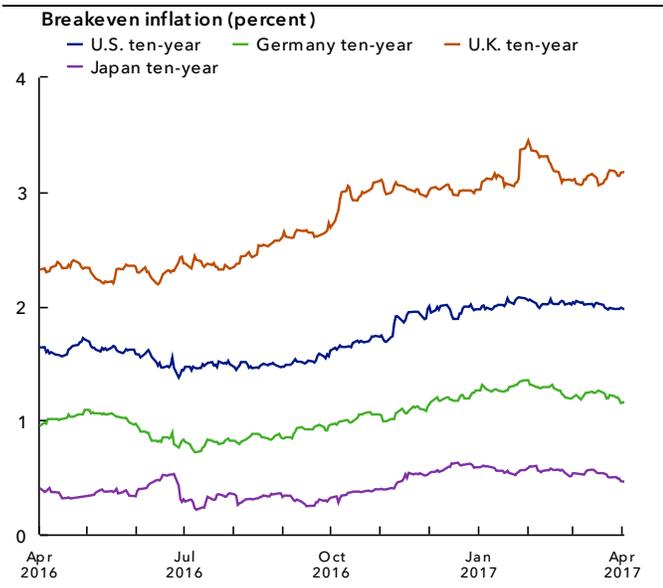
Note: VVIX Index measures the expected volatility of the 30-day forward price of the CBOE VIX Index. Source: Bloomberg Finance L.P.



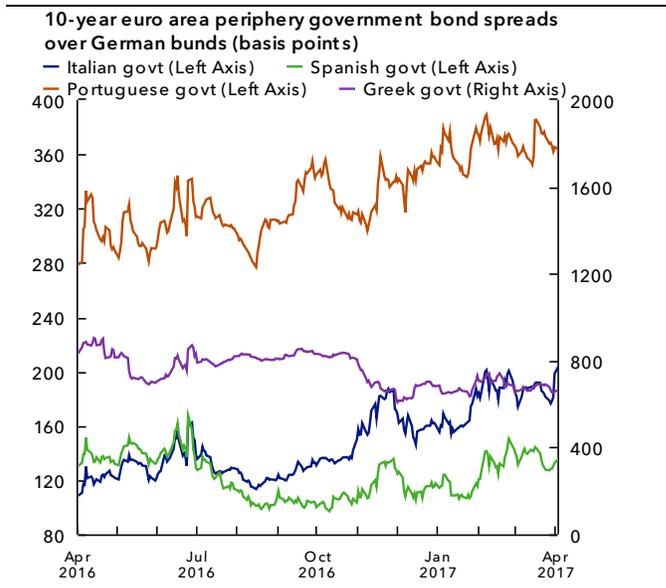
Source: Bloomberg Finance L.P.



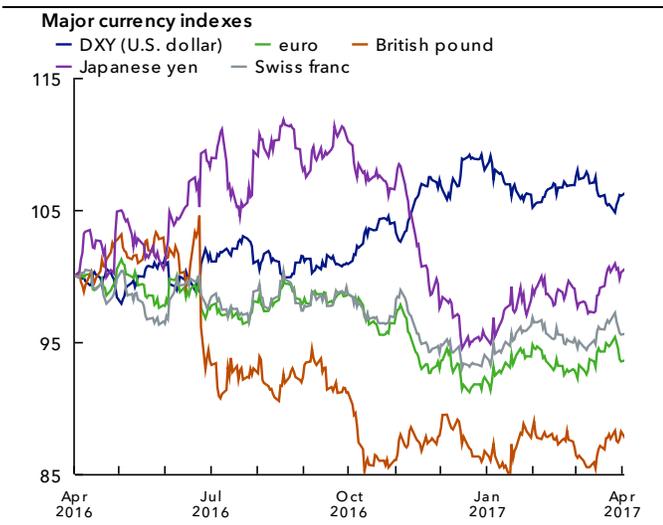
Source: Bloomberg Finance L.P.



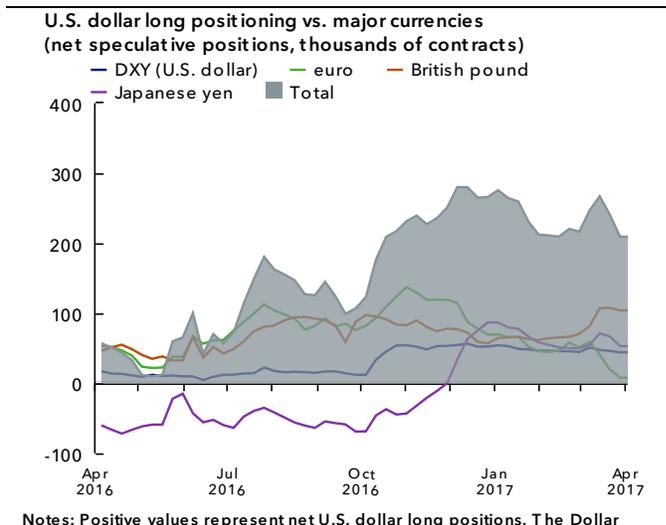
Source: Bloomberg Finance L.P.



Source: Bloomberg Finance L.P.

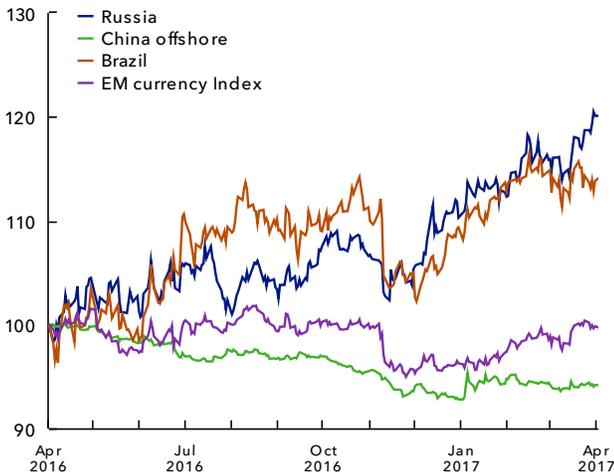


Notes: Foreign currency indexes represent greater strength versus the U.S. dollar. DXY increases represent greater strength of the U.S. dollar versus a basket of major world currencies. Index 100 = April 01, 2016.  
 Source: Bloomberg Finance L.P.



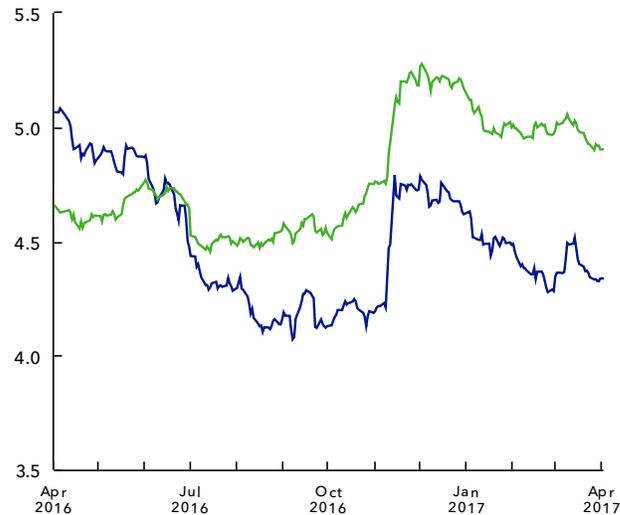
Notes: Positive values represent net U.S. dollar long positions. The Dollar Index (DXY) is a futures contract based on the U.S. dollar's value against a basket of major world currencies. To express a U.S. dollar long position in a non-U.S. dollar contract, the contract must be shorted.  
 Source: Bloomberg Finance L.P.

**Emerging market currencies**  
(U.S. dollars per foreign currency unit)



Notes: Increasing values indicate strengthening versus the U.S. dollar. Index 100=April 01, 2016.  
Source: Bloomberg Finance L.P.

**Emerging market sovereign debt yield**  
— EM hard currency — EM local currency



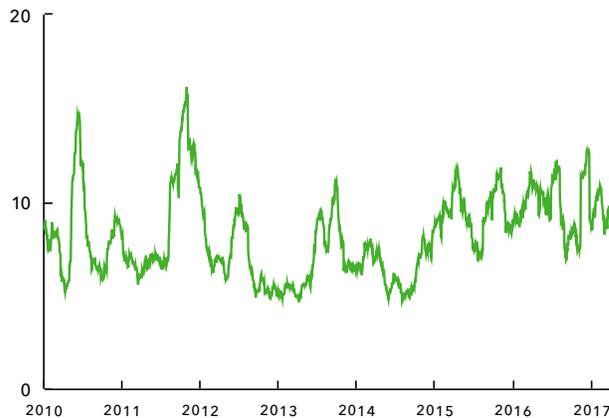
Source: Bloomberg Finance L.P.

**Equity price indexes**



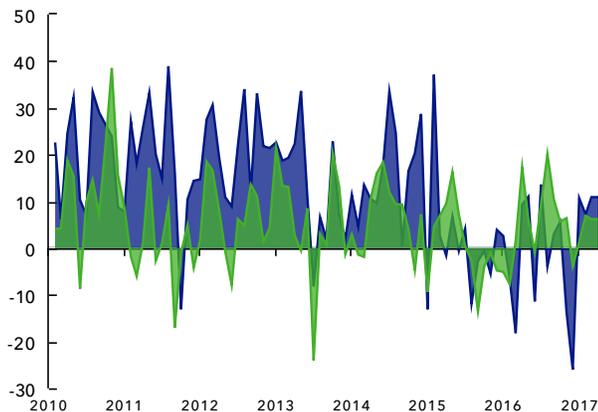
Notes: The US equity index is the S&P 500 Index. The Chinese equity index is the Shanghai Composite Index. The Developed Economies index is the MSCI World Index and the Emerging Markets index is the MSCI EM Index (both are in local terms). Index 100 = April 01, 2016.  
Source: Bloomberg L.P.

**1-month realized emerging markets volatility (percent)**  
— EM currencies



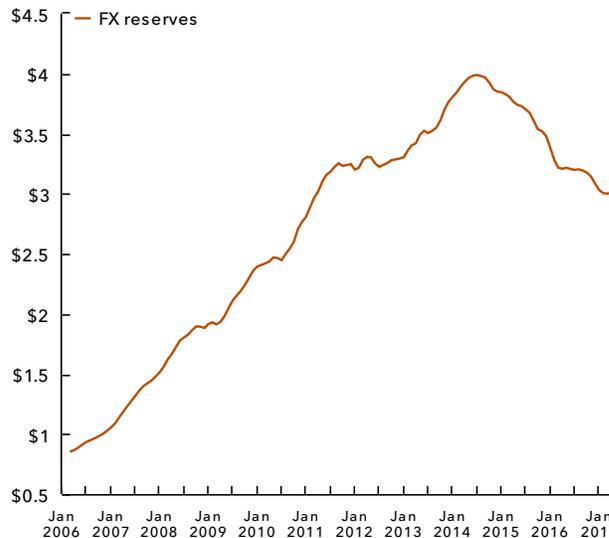
Notes: Realized volatility is the annualized standard deviation. Hard currency sovereign debt based on the J.P. Morgan Emerging Bonds - Global Price Index and currencies based on a weighted average of EM currency returns against the dollar using weights from J.P. Morgan VXY-EM currency volatility index.  
Sources: Bloomberg L.P., OFR analysis

**IIF portfolio flows to emerging markets (\$ billion)**  
■ Debt flows ■ Equity flows



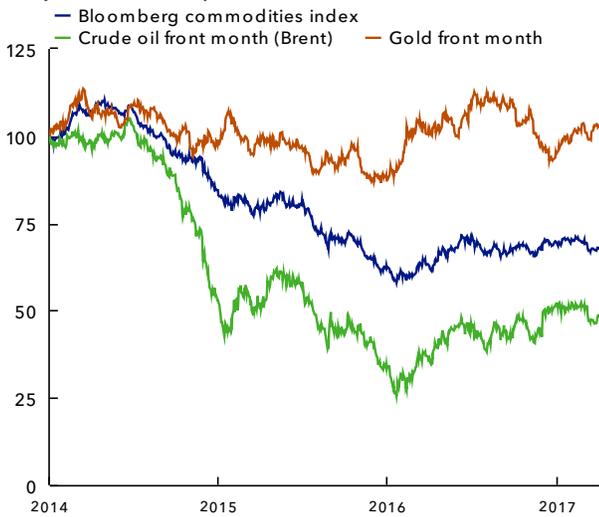
Notes: Data represent the Institute of International Finance's monthly estimates of non-resident flows into thirty EM countries. Data for latest observations are derived from IIF's empirical estimates using data from a smaller subset of countries, net issuance, and other financial market indicators.  
Source: Bloomberg

**China's Foreign Exchange Reserves (\$ trillion)**



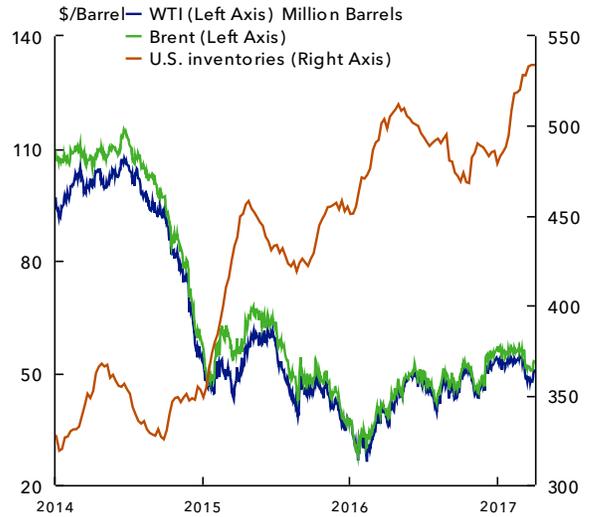
Source: Bloomberg

Major commodities prices



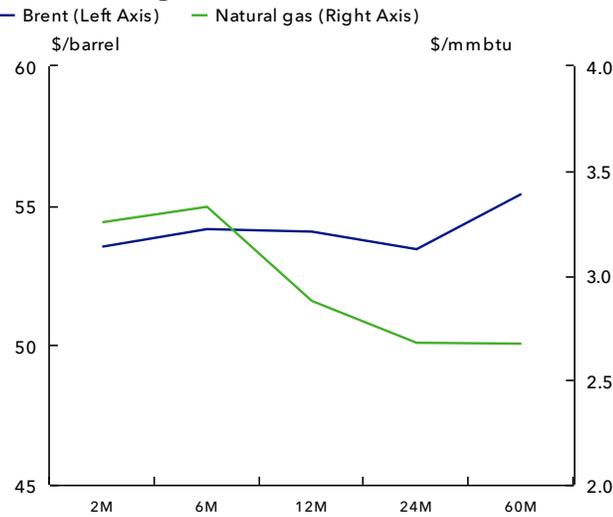
Notes: Index 100 = January 01, 2010  
Source: Bloomberg Finance L.P.

Crude oil



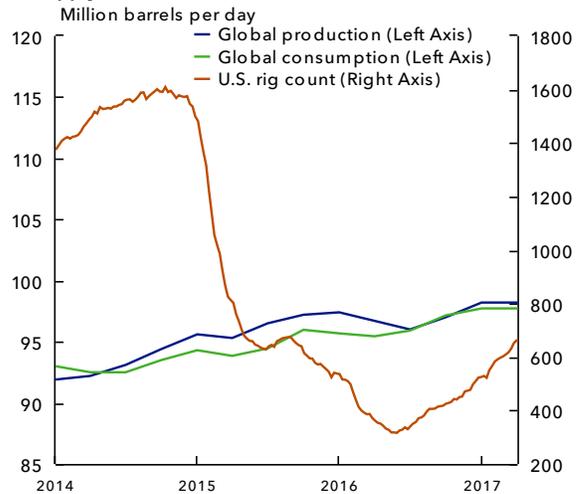
Note: WTI and Brent are front-month contracts.  
Source: Bloomberg Finance L.P.

Oil and natural gas futures curves



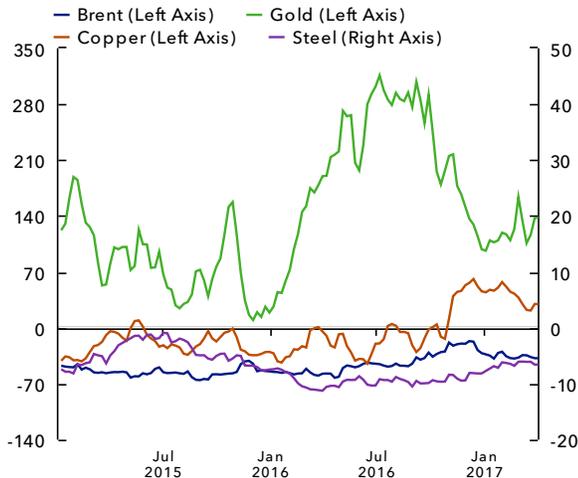
Note: Data as of April 03, 2017.  
Sources: Bloomberg Finance L.P., OFR analysis

Oil supply and demand factors



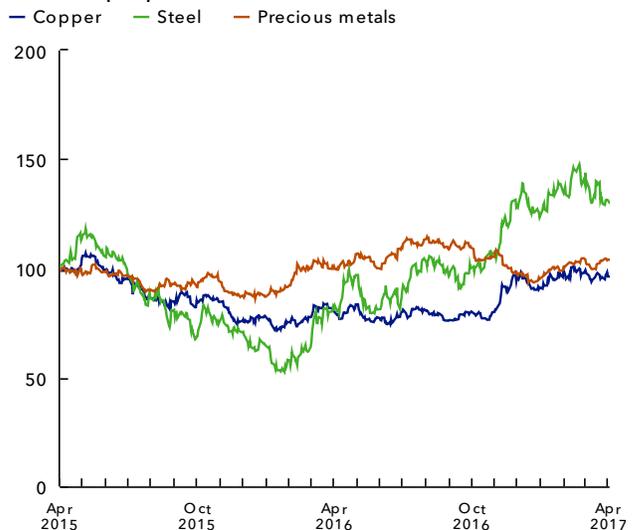
Note: Global production and consumption are estimates by the International Energy Agency.  
Source: Bloomberg Finance L.P.

Speculative futures positioning (thousands of contracts)



Notes: Positive values represent net long positions. Negative values represent net short positions.  
Source: Bloomberg Finance L.P.

Metals spot price indexes



Note: Index 100 = January 01, 2010.  
Source: Bloomberg Finance L.P.