

## Markets Tentatively Stabilize; Growth and Policy Concerns Persist

*Global risk assets, such as stocks and corporate bonds, sold off sharply in the first six weeks of 2016. They have partly recovered, but many of the underlying concerns remain. The outlook for global growth is still weak. Excess supply persists in oil markets, and oil price swings are spilling into U.S. stock and corporate bond markets. Some investors fear monetary policymakers have run out of effective tools to stimulate growth. Some also fear negative interest rates will do more harm than good.*

*In this edition of the markets monitor, we discuss market concerns about negative interest rates, the sell-off in bank stocks, and the high levels of U.S. stock valuations. We start with a review of key developments.*

### Developments in the first quarter of 2016

- In January, renewed concerns about Chinese economic policies and growth triggered sharp sell-offs in risk assets. Global markets for stocks and corporate bonds fell sharply. Plunging oil prices worsened the sell-offs.
- The Bank of Japan unexpectedly cut a key interest rate below zero in January (to -0.1 percent). That added to Japan's aggressive policies to stimulate the weak economy and inflation. Many in the market expressed doubt that negative rates would be successful. The move renewed debates about whether monetary policymakers have run out of effective tools and whether negative rates do more harm than good.
- Many risk assets have had "relief rallies" since mid-February. The trigger was news of a potential oil production freeze by the Organization of the Petroleum Exporting Countries. More accommodative policy signals in the euro area, U.S., and China also contributed to the rally. By March 31, oil prices and leading indexes for U.S. stocks and corporate bonds had fully recovered from early-year losses. However, U.S. bank stocks and major foreign markets remain significantly weaker than they were at year-end, and long-term U.S. Treasury yields are again near historic lows.
- The European Central Bank announced monetary easing measures in March that exceeded market expectations. The Federal Open Market Committee (FOMC) released a new set of forecasts in March that was viewed as consistent with an easier path for policy.
- Market concerns that the United Kingdom may exit the European Union grew. A June date was set for a U.K. referendum on the matter, and some prominent politicians announced support for exit. The British pound fell to its lowest point against the dollar since early 2009.

## Markets focused on negative interest rates and their potential risks.

Market commentary and analysis have focused on negative interest rates since the Bank of Japan's surprise January decision to cut rates below zero on new excess reserves. There are two leading concerns:

- (1) Will other major central banks surprise markets by cutting rates below zero?
- (2) What risks do negative rates pose to financial institutions' business models and market functioning?

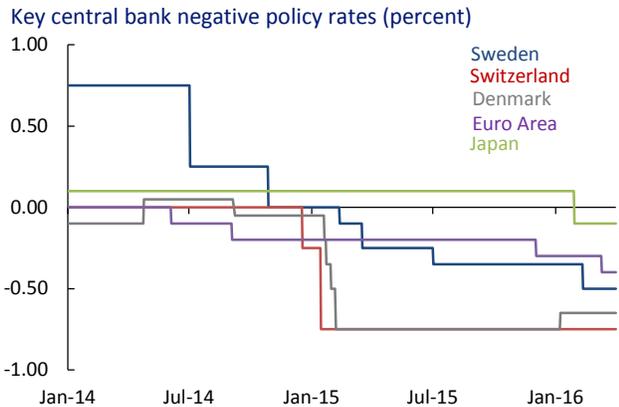
**Will other central banks “go negative”?** Some European central banks have already introduced negative interest rates in recent years (see Figure 1). The news in Japan raised the possibility that other major central banks might follow suit as global growth slows. Since the Bank of Japan's decision in January, central banks in Canada and Norway have discussed negative rates as policy options and the European Central Bank cut rates further into negative territory.

Expectations for negative rates in the United States remain very low. In the March FOMC press conference, Federal Reserve Chair Janet Yellen said the central bank is “not actively considering negative rates” and that other options could be used if the economic outlook called for more stimulus. Although market expectations for the federal funds rate have declined, the expected path is still well above zero (see Figure 2). Market participants expect the FOMC to use other tools before cutting rates below zero. These tools include returning the federal funds rate to the 0-to-0.25 percent range or resuming large-scale asset purchases.

**What risks do negative rates pose to financial markets?** Negative interest rates reverse the returns on savings and investments. Savers and investors, accustomed to earning returns, instead must pay returns to borrowers. Some market participants have expressed the concern that this could cause a withdrawal of savings and investments that would disrupt the functioning of certain financial markets.

To date, market participants have not reported major disruptions in the European economies with negative rates. There have been no reports of major shifts in

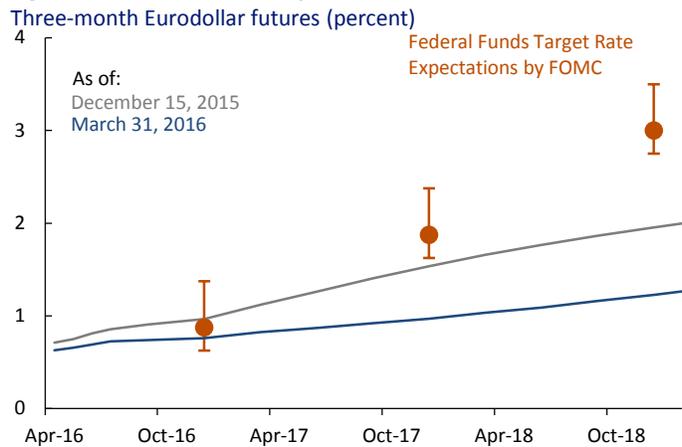
**Figure 1. More central banks have adopted negative rates**



Note: Rates in Sweden represent the central bank repo rate; in Switzerland, the overnight sight deposit rate; in Denmark, the one-week CD; in the euro area, the overnight deposit facility rate; in Japan, the macro add-on balance on new excess reserves.

Source: Bloomberg L.P.

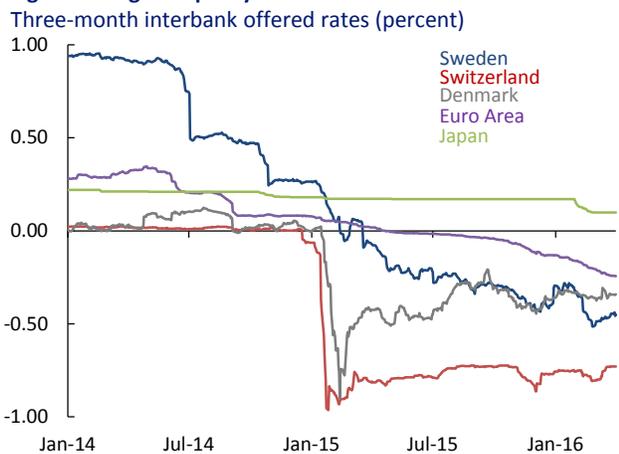
**Figure 2. U.S. interest rate expectations flattened**



Note: FOMC expectations are from the 03/16/2016 meeting.

Source: Bloomberg L.P.

**Figure 3. Negative policy rates drove interbank rates lower**



Source: Bloomberg L.P.

market structure or functioning. Negative policy rates have been successfully transmitted to interbank rates, repurchase agreement rates, and foreign exchange basis swap rates (see Figures 3 and 4). In some cases, banks have passed on the negative rates to corporate depositors, but generally not to retail depositors.

However, these experiences with negative rates have been too limited to rule out disruptions in the future or in other markets. Policy rates have been only modestly negative so far — lower negative rates could cause greater withdrawals by savers and investors. Similarly, most of these economies have had negative rates for less than a year, and longer-term responses could be different.

Meanwhile, some of the observed responses to negative rates may increase risks over time.

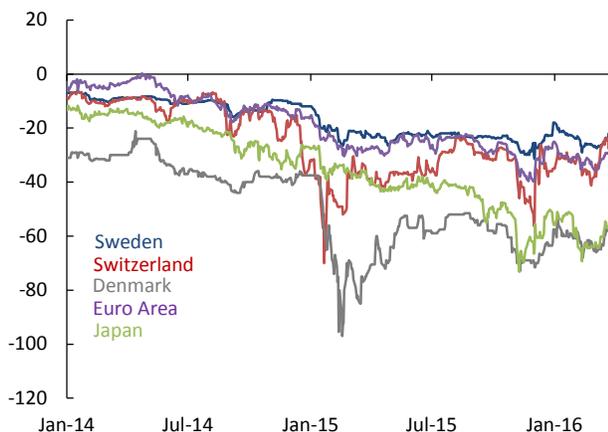
- European money market funds have expanded their investments outside Europe to find yield. This strategy may increase currency risk in these funds.
- Some European companies are exploring cutting cash balances to reduce the impact of negative rates.
- Japanese money market funds have had heavy investor withdrawals in recent months, forcing some funds to close. More fund closures could reduce liquidity in Japan's short-term funding markets.

In addition, the reductions in interest rates in Europe and other foreign countries may spill over to U.S. interest rates. Long-term U.S. Treasury yields and term premiums fell markedly in the first quarter, and they are again near historic lows (Figure 5). As discussed in the [OFR's 2015 Financial Stability Report](#), the continued low level of U.S. long-term interest rates is a source of financial stability risk.

**Bank stocks came under pressure due to interest rates, growth fears, and local concerns.**

In early 2016, bank stocks in advanced economies had large losses (see Figure 6). Tensions spread to debt obligations of global banks as credit default swap spreads widened sharply (see Figure 7). The pressure on banks eased during the broader relief rally that

**Figure 4. Negative policy rates depressed foreign exchange bases**  
One-year cross-currency basis swap rates (basis points)



Source: Bloomberg L.P.

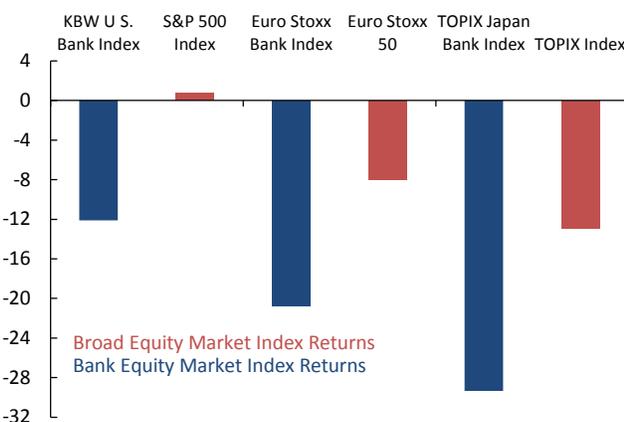
**Figure 5. Treasury term premium fell further**  
Ten-year term premium (percent)



Note: Ten-year Treasury term premium based on the Adrian, Crump, and Moench (2013) model.

Source: Bloomberg L.P.

**Figure 6. Bank stocks sold off markedly**  
Year-to-date global bank and equity index returns (percent)



Note: Local currency returns, index 100 = December 31, 2015

Source: Bloomberg L.P.

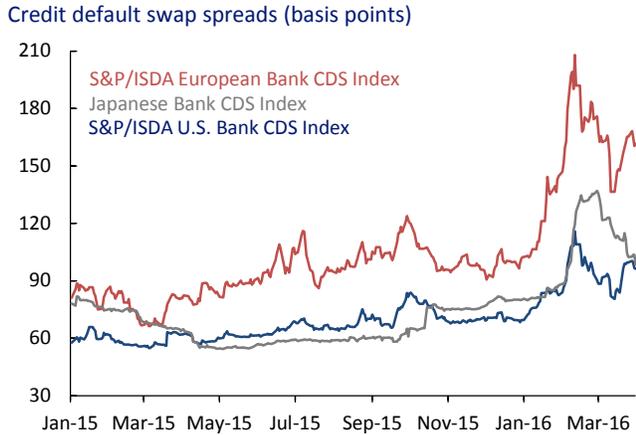
started in mid-February. But bank stocks and credit default swaps (CDS) remain considerably weaker than they were at year-end. There are several common underlying factors, as well as some that are unique to certain regions and institutions.

**Investors fear that negative rates, flatter yield curves, and slowing global growth will hurt bank profits.** The Bank of Japan's adoption of a negative interest rate, and the fear of others following, was a catalyst for the bank sell-off. Japanese bank stocks have fallen most. The fear is that negative rates will disrupt bank business models or at least reduce their interest margins. The recent flattening of yield curves is also expected to reduce banks' interest margins and, therefore, expected earnings (see Figure 8). Investors expect less revenue from loans and investment banking due to slower global economic growth. Many advanced economy banks also have exposure to the energy sector and emerging markets. Weak oil prices and financial turbulence in some emerging markets pose challenges due to these exposures.

**The sell-off in European bank stocks was amplified by local factors.** Several large European banks, including Deutsche Bank and Credit Suisse, posted fourth-quarter earnings well below market expectations. These results sharpened investors' focus on European banks' relatively weaker earnings and capital positions.

Concerns over contingent convertible capital securities (CoCos) added to the market pressure on European banks. Deutsche Bank's disappointing earnings announcement led to speculation that the bank might not make coupon payments on some of its CoCo instruments. The price of some of Deutsche Bank's CoCo bonds fell below 75 percent of par value and pressure mounted on the broader European CoCo market (see Figure 9). Deutsche Bank clarified that it will continue making coupon payments, but new issuance in the CoCo market reportedly remains expensive for euro area banks with lower capital ratios. This situation is a concern because many of these banks will need to raise capital in the coming years to meet regulatory standards.

**Figure 7. Bank CDS spreads widened sharply on credit worries**



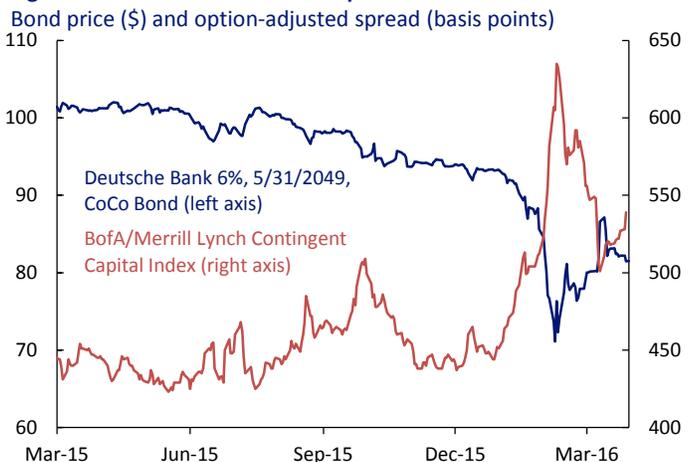
Note: Japanese Bank CDS Index is the average of 5-year Senior CDS on Bank of Tokyo-Mitsubishi UFJ, Mizuho Bank, Nomura Holdings, and Sumitomo Mitsui Banking Corp.  
Source: Bloomberg L.P.

**Figure 8. Flatter yield curve compressed bank net interest margins**  
U.S. Treasury yields (percent) and yield curve (basis points)



Source: Bloomberg L.P.

**Figure 9. CoCo bonds came under pressure**



Source: Bloomberg L.P.

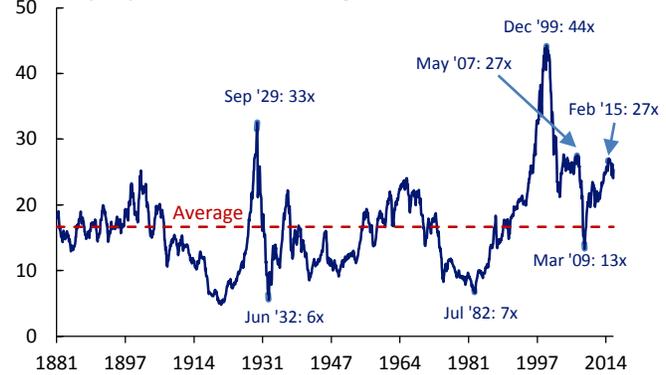
**U.S. stock valuations remain high and fundamentals are weak.**

After the recent recovery in U.S. stock prices, the S&P 500 Index is close to its level of a year ago, and less than 5 percent from its record high reached last May. Meanwhile, fundamentals continued to deteriorate. U.S. corporate profit margins have trended lower since peaking in the third quarter of 2014. Consensus estimates for S&P 500 pro forma earnings are for less than 1 percent growth in 2016, down from earlier forecasts of more than 10 percent. The slowdown in earnings growth is not limited to energy firms. Excluding energy, pro forma earnings are expected to decline 3.6 percent in the first quarter of 2016.

The [March 2015 Financial Markets Monitor](#) highlighted that U.S. stock valuations were very high according to a number of metrics. One year later, those valuation metrics remain elevated. Specifically, the cyclically-adjusted price-to-earnings ratio (CAPE), the ratio of market value of corporate equities outstanding to net worth (Q ratio), and the ratio of market value to Gross National Product (Buffett indicator) remain highly elevated compared to long-term averages (see Figures 10, 11, and 12). These metrics are discussed in depth in the OFR Brief [Quicksilver Markets](#). They provide a view of valuations that is less subject to cyclical inflation than metrics based on one-year earnings or forecasts.

**Figure 10. CAPE ratio is near prior peak**

Cyclically Adjusted Price-to-Earnings Ratio (CAPE ratio)



Note: Data as of March 2016. CAPE is the ratio of the monthly S&P 500 price level to trailing 10-year average earnings (inflation adjusted).

Sources: Robert Shiller, OFR analysis

**Figure 11. Q-Ratio well above average and most cyclical highs**

Q-Ratio (percent)

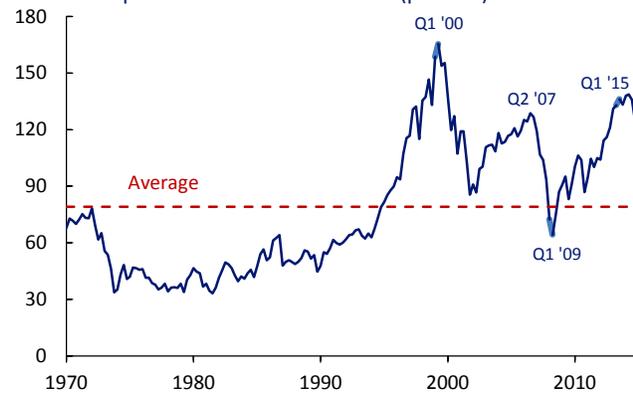


Note: Data as of Q4 2015. Q-ratio is the market value of nonfinancial corporate equities outstanding divided by net worth at market value.

Sources: Haver Analytics, OFR analysis

**Figure 12. Buffett indicator well above average**

Ratio of corporate market value to GNP (percent)



Note: Data as of Q4 2015. Buffett indicator is the market value of corporate equities (Wilshire 5000 market capitalization) divided by nominal GNP.

Sources: Haver Analytics, Wilshire Associates

## Selected Global Asset Price Developments

	LATEST LEVEL (3/31/2016)	90-DAY CHANGE (bps or %)	90-DAY CHANGE (standard deviations)*	YTD CHANGE (bps or %)	12-MONTH RANGE**
<b>EQUITIES</b>					
S&P 500	2060	0.8%	-0.2	1%	
U.S. KBW Bank Index	64	-12.1%	-1.1	-12%	
Russell 2000	1114	-1.9%	-0.4	-2%	
Nasdaq	4870	-2.7%	-0.4	-3%	
Euro Stoxx 50	3005	-8.0%	-0.9	-8%	
Shanghai Composite	3004	-15.1%	-1.0	-15%	
Nikkei 225	16759	-12.0%	-1.1	-12%	
Hang Seng	20777	-5.2%	-0.6	-5%	
FTSE All World	263	-0.2%	-0.2	0%	
<b>RATES</b>					
U.S. 2-Year Yield	0.72%	-33	-0.5	-33	
U.S. 2-Year Swap Rate	0.84%	-34	-0.5	-34	
U.S. 10-Year Yield	1.77%	-50	-0.9	-50	
U.S. 10-Year Swap Rate	1.64%	-55	-0.9	-55	
U.S. 30-Year Yield	2.61%	-40	-0.8	-40	
U.S. 2y10y Spread	104	-17	-0.5	-17	
U.S. 5Y5Y Inflation Breakeven	1.70%	-11	-0.3	-11	
U.S. 5Y5Y Forward Rate	2.41%	-44	-0.7	-44	
Germany 10-Year Yield	0.15%	-48	-1.1	-48	
Japan 10-Year Yield	-0.03%	-29	-0.8	-29	
U.K. 10-Year Yield	1.42%	-55	-1.1	-55	
Euro area 5Y5Y Inflation Breakeven	1.41%	-28	-1.6	-28	
<b>FUNDING</b>					
1M T-Bill Yield	0.17%	5	0.2	5	
DTCC GCF Treasury Repo	0.64%	0	-0.3	0	
3M Libor	0.63%	2	0.1	2	
Libor-OIS Spread	25	1	0.0	1	
EURUSD 3M CCY Basis Swap	-25	-7	-0.1	-7	
<b>U.S. MBS</b>					
FNMA Current Coupon	2.57%	-43	-0.8	-43	
FHLMC Primary Rate	3.71%	-30	-0.6	-30	
<b>CREDIT</b>					
CDX Investment Grade 5-Year CDS Spread	78	-10	-0.5	-10	
CDX High Yield 5-Year CDS Spread	442	-32	-0.2	-32	
CDX Itraxx Euro 5-Year CDS Spread	73	-4	-0.2	-4	
U.S. 5-Year Sovereign CDS Spread	20	2	0.3	2	
<b>IMPLIED VOLATILITY</b>					
VIX Index	14	-23%	-0.8	-23%	
V2X Index	23	6%	0.1	6%	
VDAX Index	21	-2%	-0.2	-2%	
MOVE Index	69	1%	0.0	1%	
3M2Y Swaption Volatility	57	1%	0.0	1%	
3M10Y Swaption Volatility	75	1%	0.0	1%	
DB G10 FX Volatility Index	11	19%	1.0	19%	
JPM EMFX Volatility Index	12	1%	-0.1	1%	
<b>FOREIGN EXCHANGE &amp; COMMODITIES</b>					
U.S. Dollar Index***	95	-4.1%	-1.0	-4%	
EUR/USD	1.14	4.8%	0.9	5%	
USD/JPY	113	-6.4%	-1.1	-6%	
GBP/USD	1.44	-2.6%	-0.6	-3%	
USD/CHF	0.96	-4.0%	-0.7	-4%	
Brent Crude	40	0.2%	0.3	0%	
Gold	1233	16.2%	2.2	16%	
S&P GSCI Commodities Index	323	3.8%	0.2	4%	
<b>EMERGING MARKETS</b>					
JPM EMFX Index	69	4.4%	1.2	4%	
MSCI Emerging Market Equity Index	837	5.4%	0.3	5%	
CDX EM 5-Year CDS Spread	284	-73	-0.9	-73	

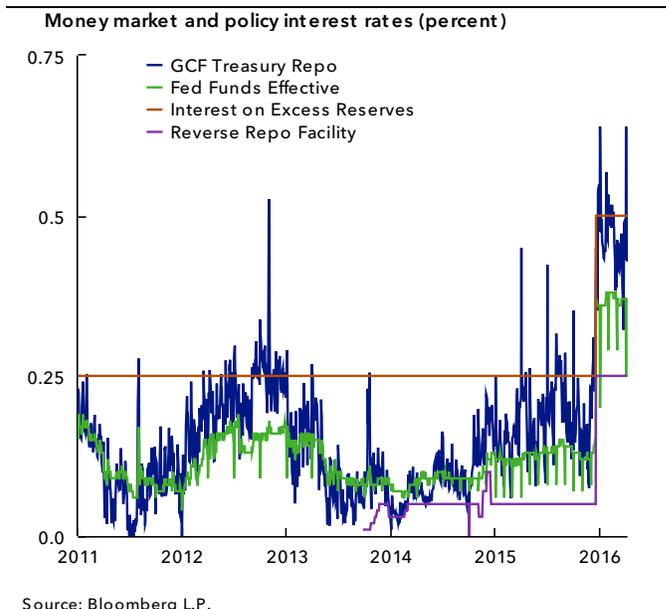
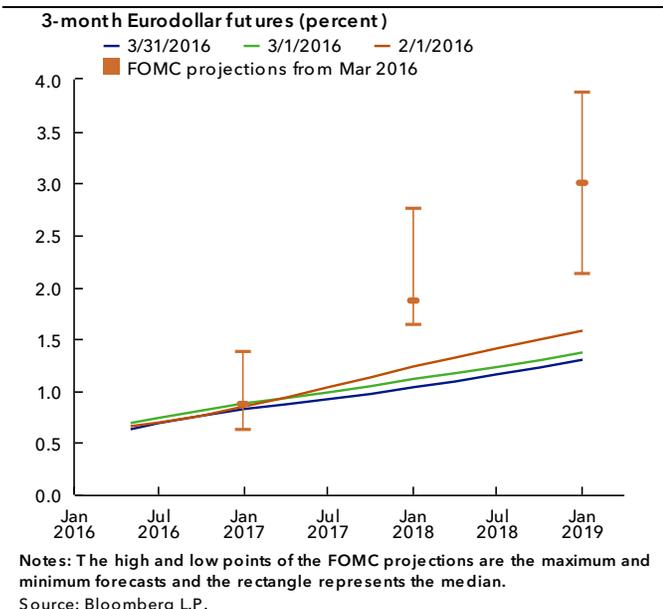
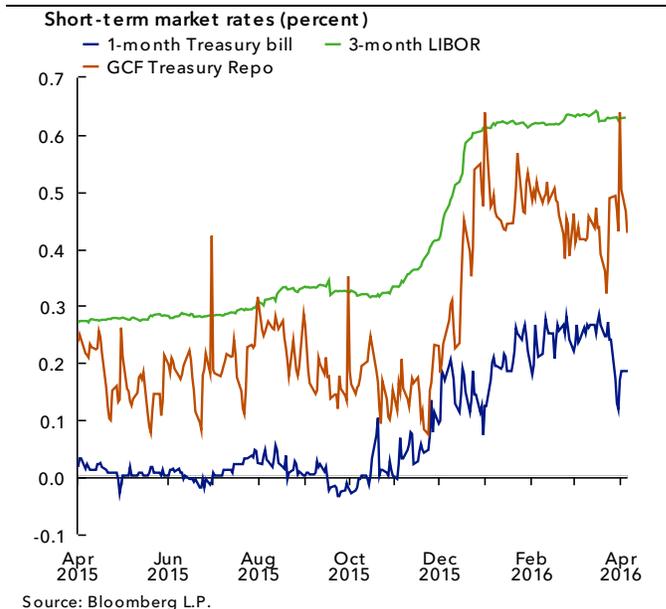
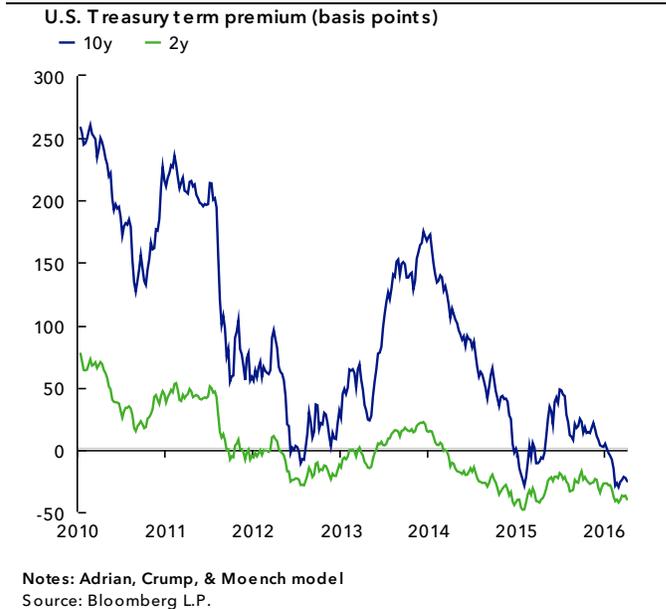
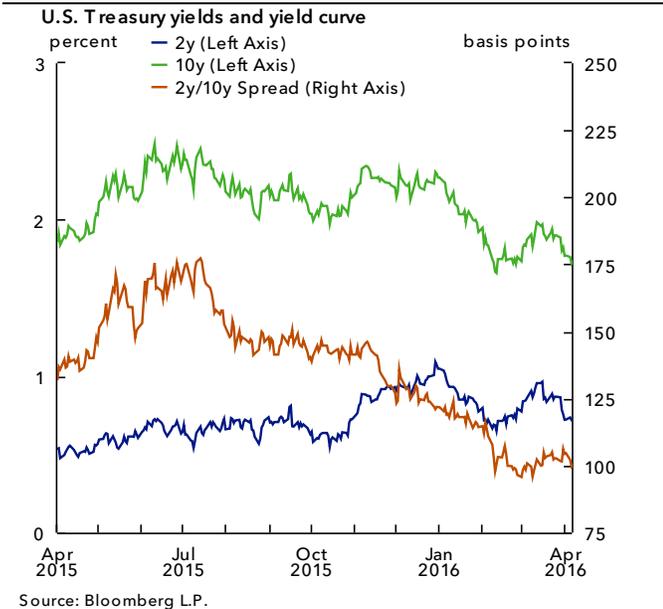
\* 90-Day change standard deviations based on quarterly data from January 1994 or earliest available thereafter.

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

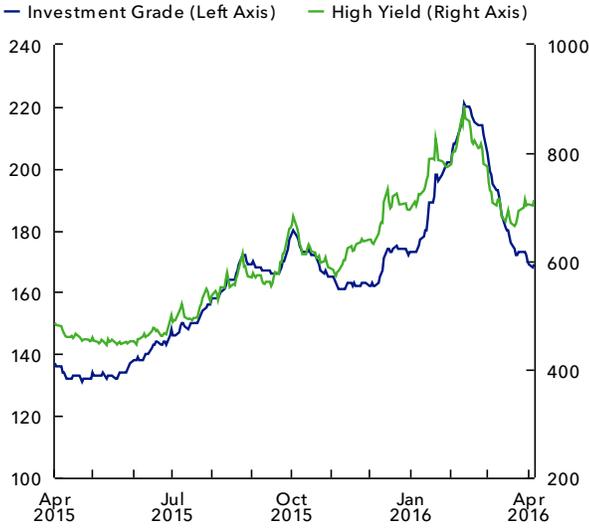
\*\*\* Dollar index from Bloomberg (ticker: DXY); averages the exchange rates between the U.S. dollar and major world currencies.

Sources: Bloomberg L.P., OFR analysis

# Select U.S. Interest Rates

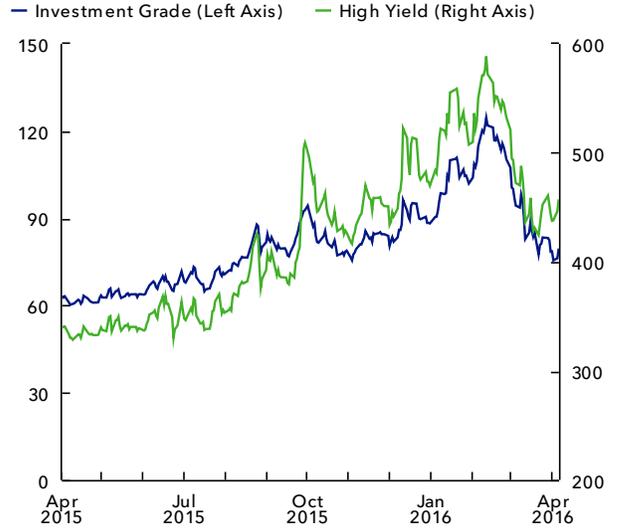


**U.S. corporate bond option-adjusted spreads (basis points)**



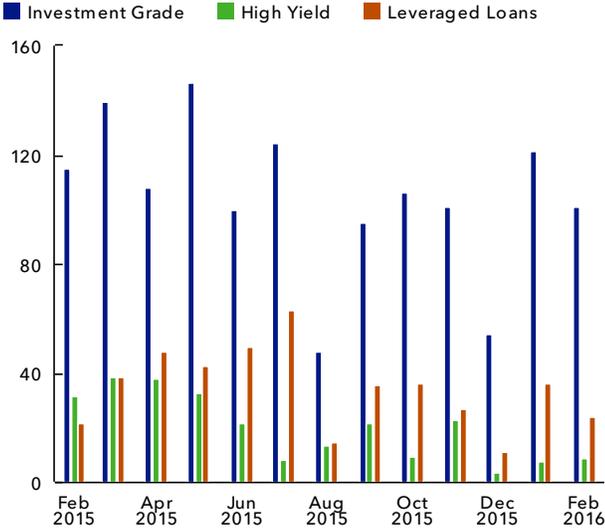
Source: Haver Analytics

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



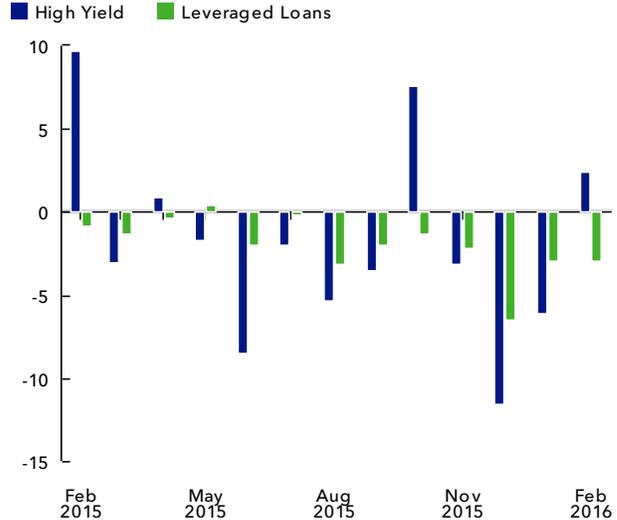
Notes: Five-year maturity CDS Index  
Source: Bloomberg L.P.

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



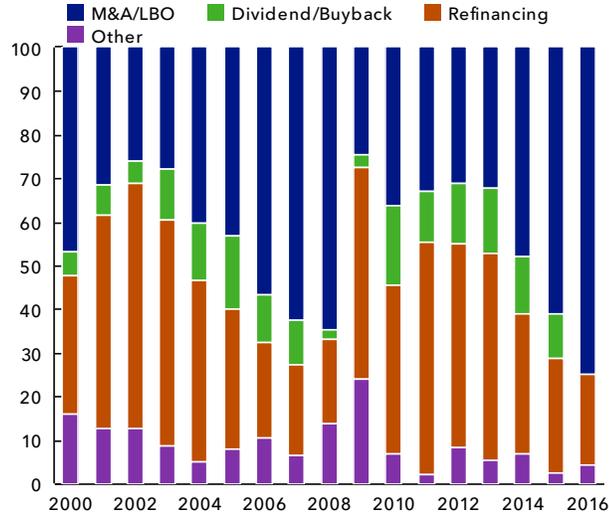
Source: Securities Industry and Financial Markets Association, Standard & Poor's Leveraged Commentary & Data

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



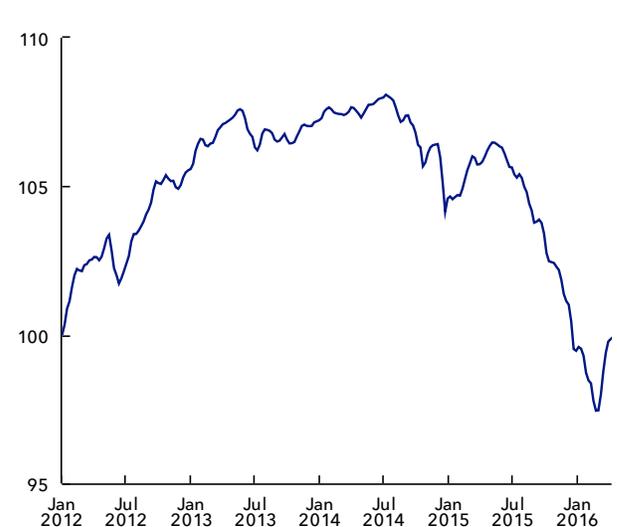
Notes: Flows data are released with one month lag. Latest data point is February 2016.  
Source: Haver Analytics

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



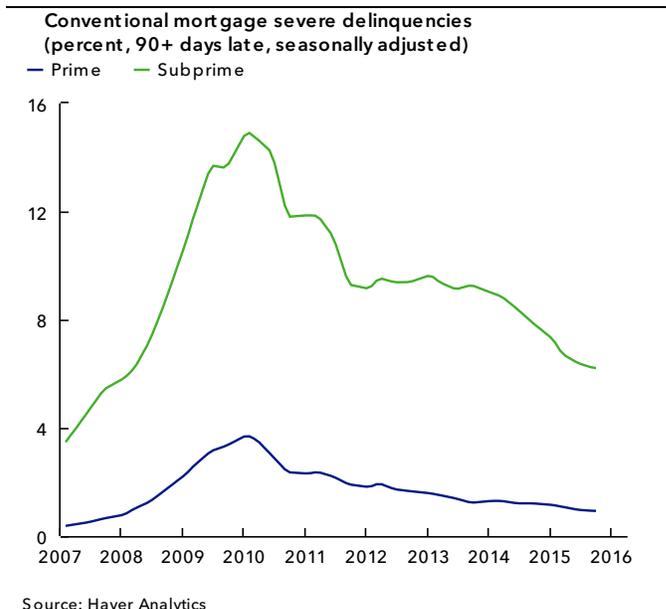
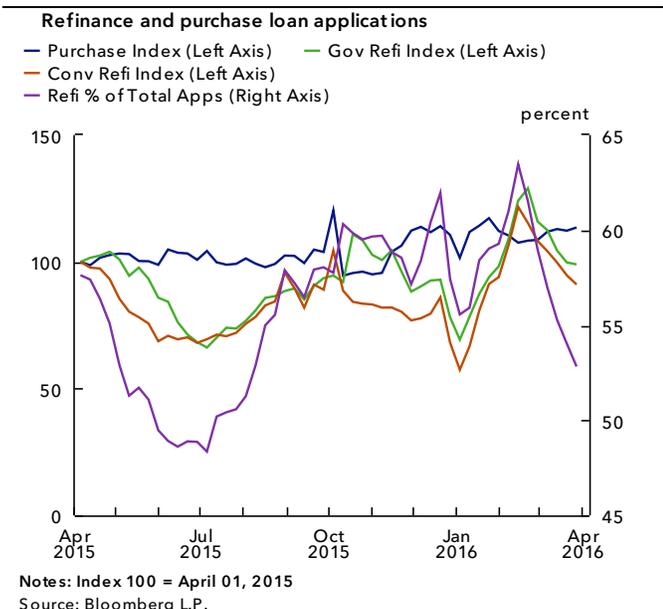
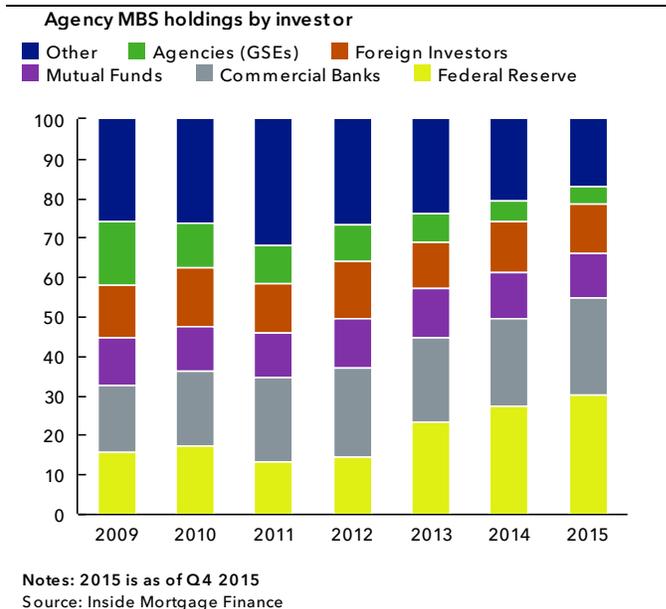
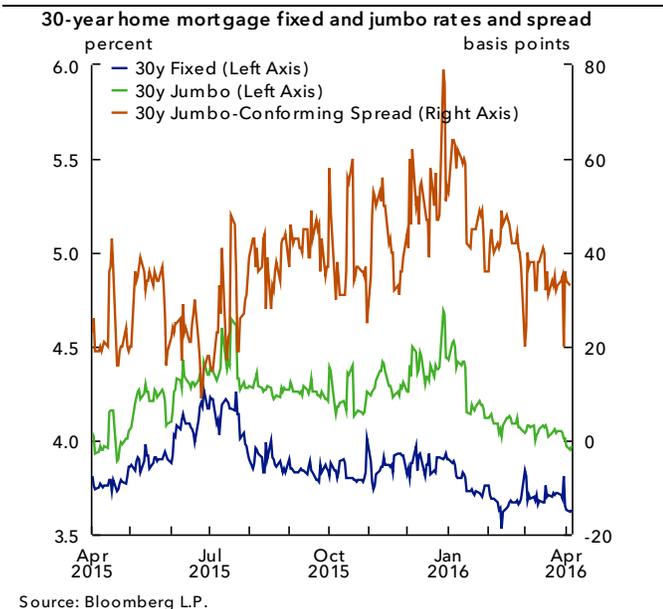
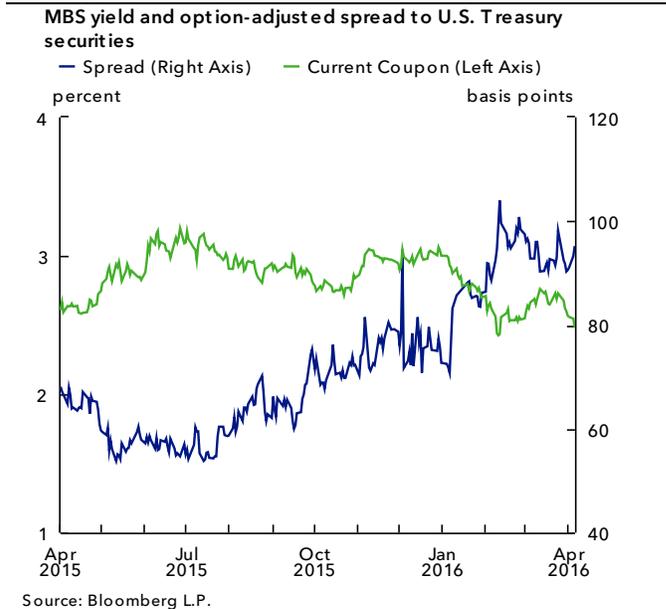
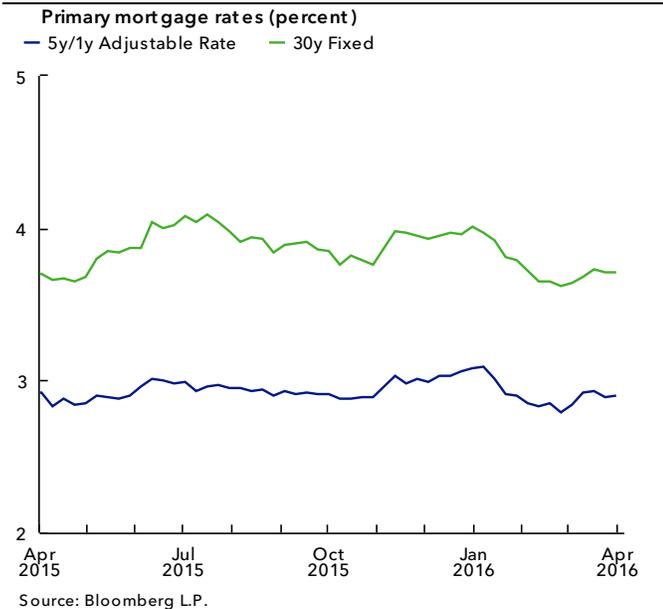
Notes: 2016 is year-to-date as of March 31st.  
Source: S&P LCD, OFR Analysis

**Leveraged loan price activity**



Notes: S&P Leveraged Loan Index. Index 100=Jan. 1st 2012  
Source: Bloomberg L.P.

# Primary and Secondary Mortgage Markets

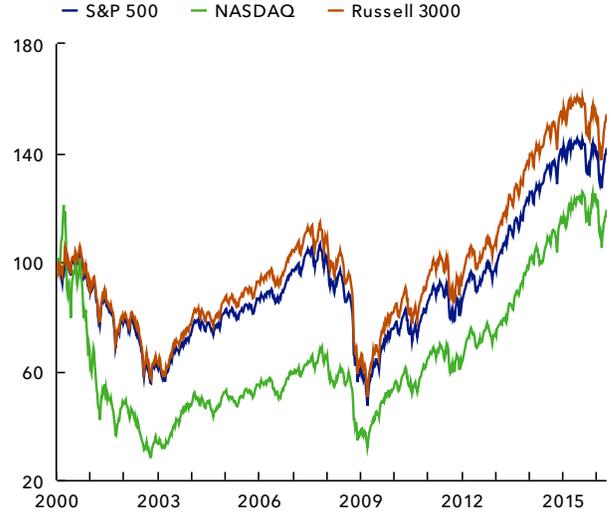


Global equity indices



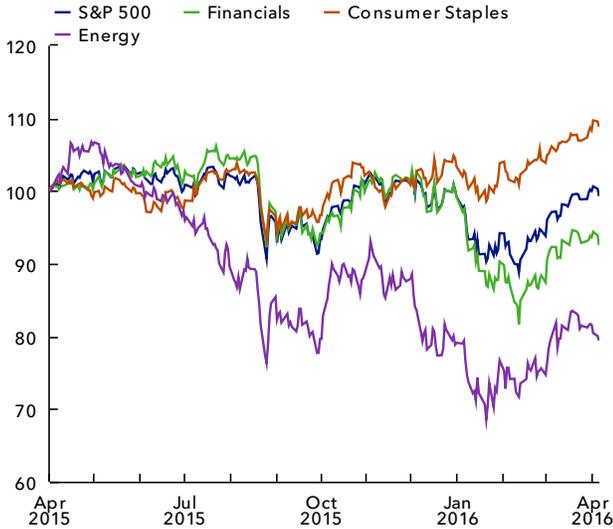
Notes: Index = April 01, 2015  
Source: Bloomberg L.P.

U.S. equity indexes



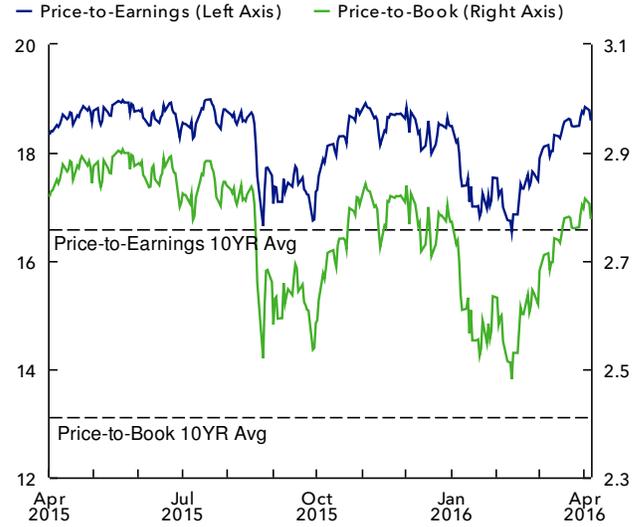
Notes: Index 100 = Jan 1, 2000  
Source: Bloomberg L.P.

S&P 500 sector performance



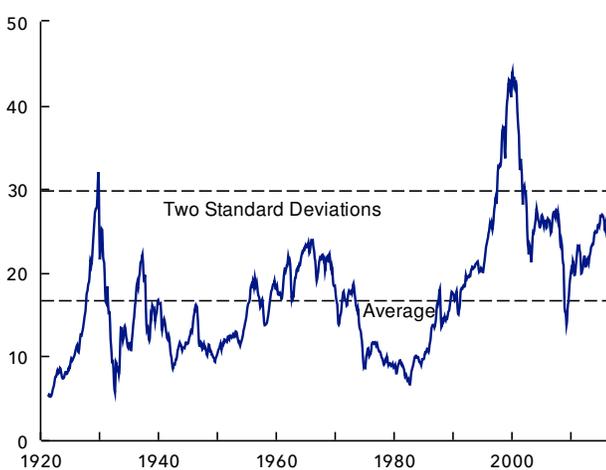
Notes: Index 100 = April 01, 2015  
Source: Bloomberg L.P.

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



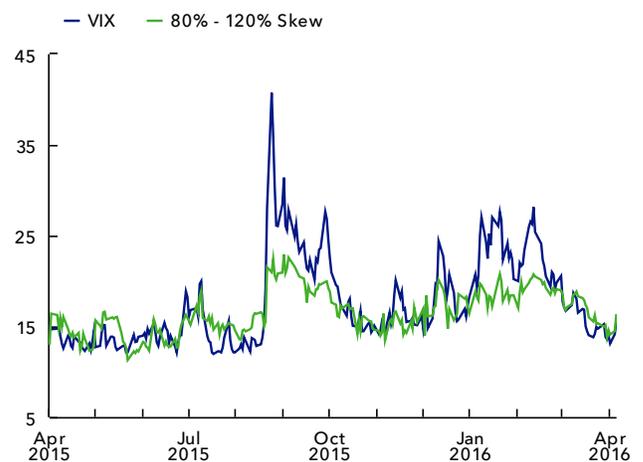
Source: Bloomberg L.P.

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



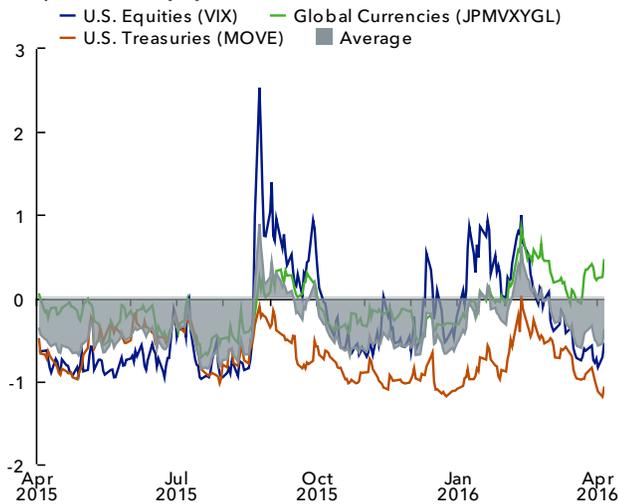
Notes: CAPE is the ratio of the monthly S&P 500 price level to trailing 10-year average earnings (inflation adjusted). Average and two standard deviations lines are based on data from 1881 to present.  
Source: Haver Analytics, OFR analysis

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



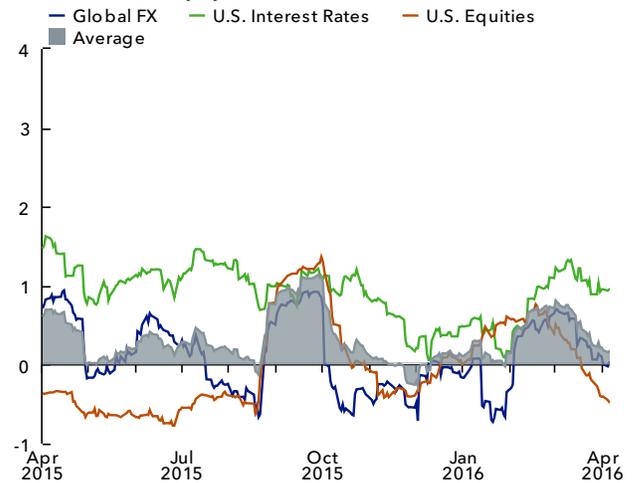
Notes: Option skew is the difference between 3-month implied volatility of out of the money puts and calls with strikes equal distance from the spot price (+/- 20%). Higher values reflect greater demand for downside risk protection.  
Source: Bloomberg L.P.

Implied volatility by asset class (z-score)



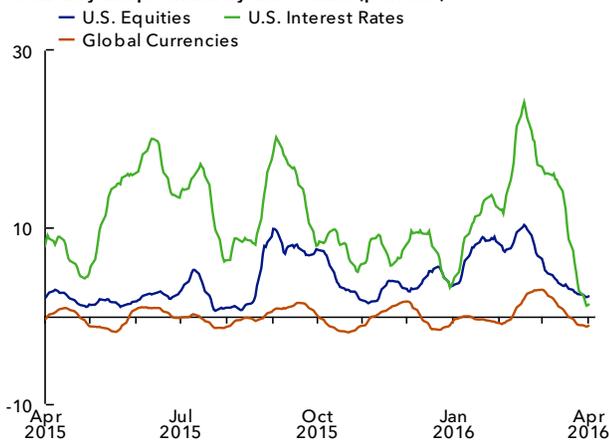
Notes: Note: Z-score represents the distance from the average, expressed in standard deviations. Standardization uses data going back to Jan 1, 1993. Source: Bloomberg L.P.

Realized volatility by asset class (z-score)



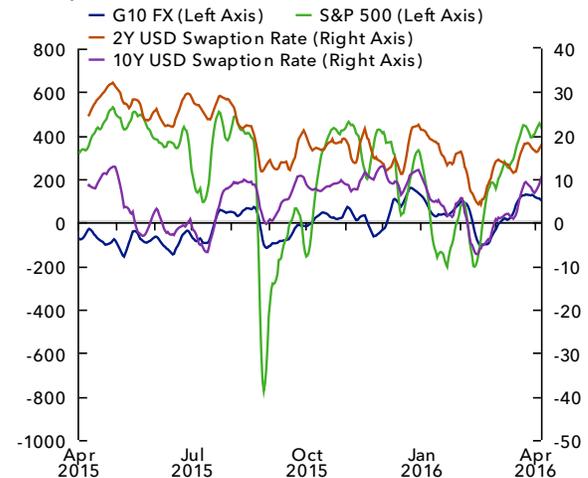
Notes: 30 Day realized volatility. Equities based on S&P 500 index, interest rates based on weighted average of T reasury yield curve, FX based on weights from JPMVXY index. Standardization uses data going back to Jan 1, 1993. Source: Bloomberg L.P., OFR Analysis

Volatility risk premium by asset class (percent)



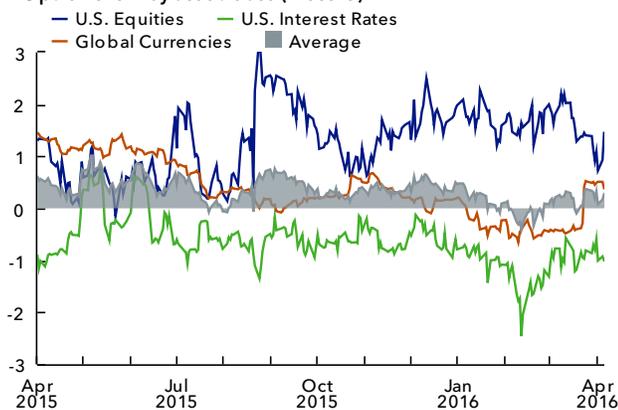
Notes: 1-month option-implied volatility minus 1-month model-predicted volatility. The latter is computed based on realized volatility, using a hetero-autoregressive model with 1, 5, and 22 day lags. U.S. Interest Rates represents the average volatility risk premium of 2- and 10-year swap rates. Equities based on S&P 500 index. Currencies based on weights from JPMVXYGL Index. Source: Bloomberg L.P., OFR Analysis

Slopes of implied volatility curves (basis points)



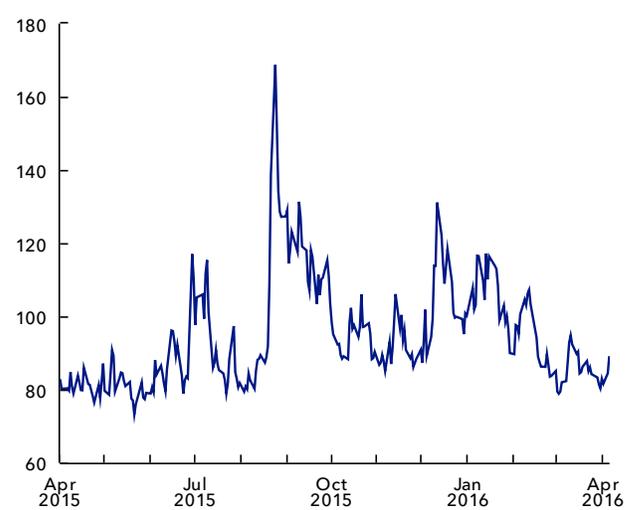
Notes: 7-day moving average. Slope represents difference between 1year and 1month maturities. G10 FX based on weights from Deutsche Bank's CVIX index. Source: Bloomberg L.P., OFR Analysis

Option skew by asset class (z-score)

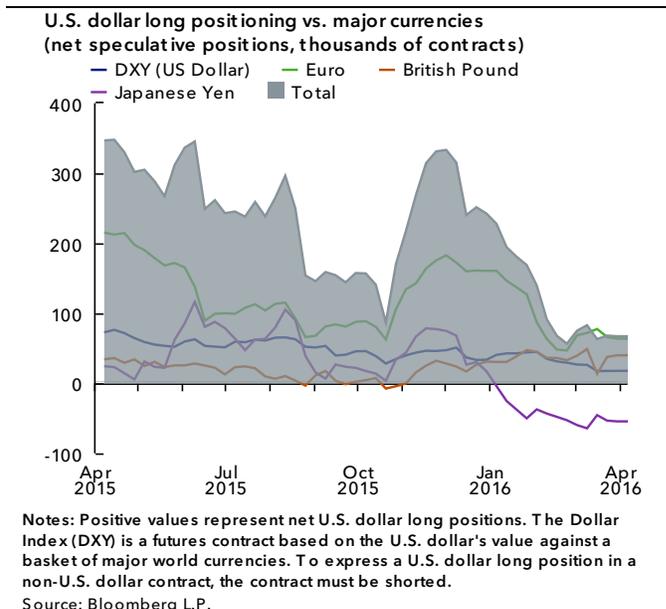
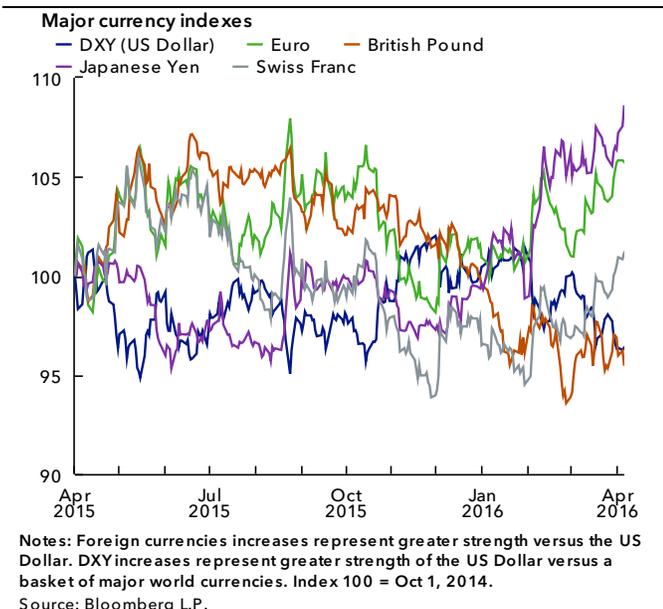
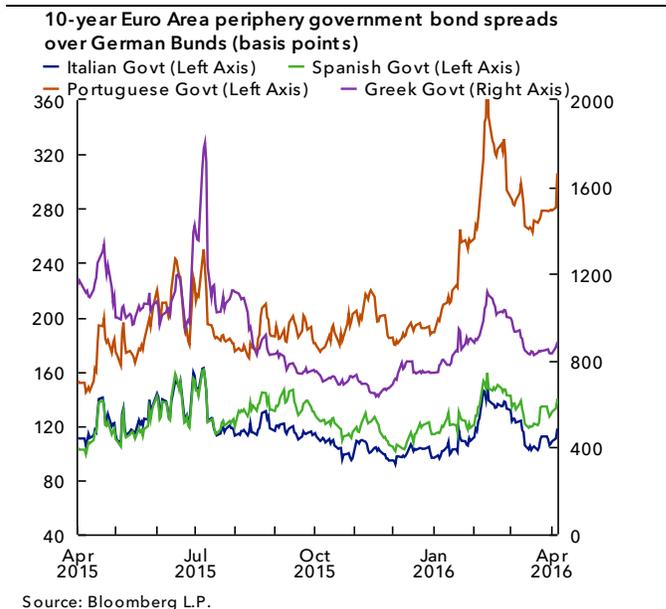
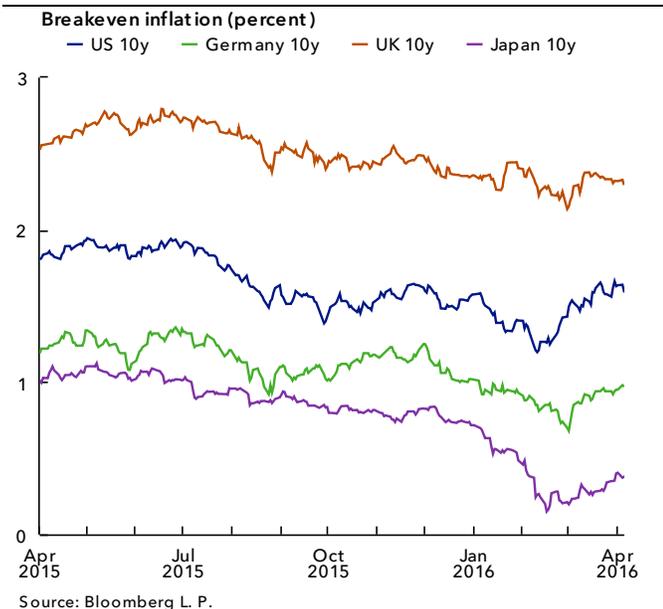
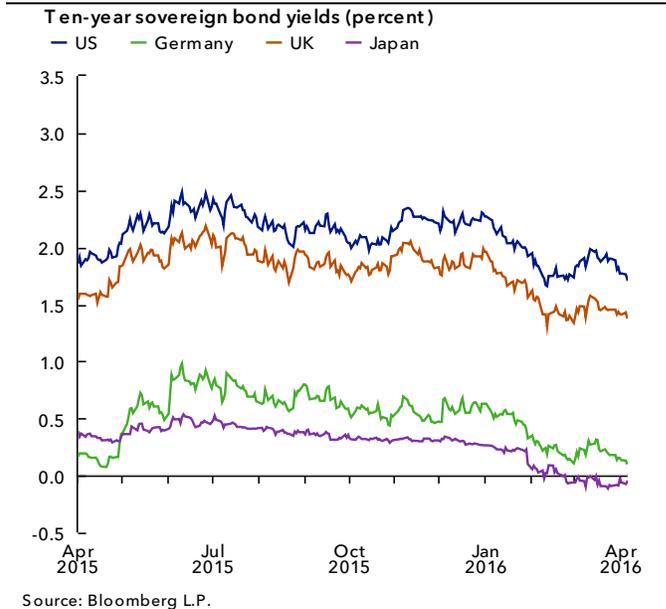
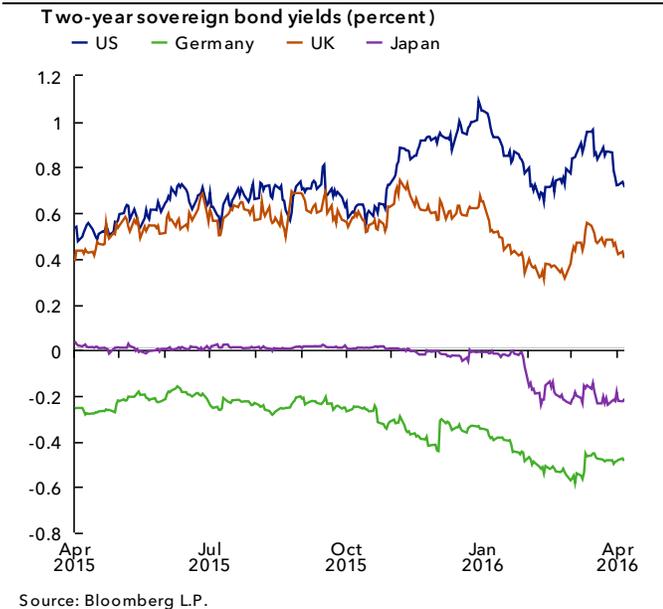


Notes: Option skew is the difference between 3-month implied volatility of out of the money puts and calls with strikes equal distance from the spot price (+/- 10%). Higher values reflect greater demand for downside risk protection. Equities represents S&P500 index. Interest rates represent weighted average skew of T reasury futures curve. Currencies represent dollar skew against major currencies based on JPMVXY index weights. Z-score standardization uses data going back to Jan 1, 2006. Source: Bloomberg L.P., OFR Analysis

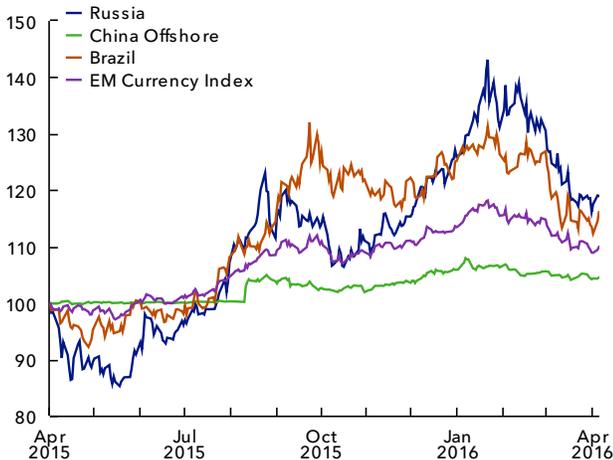
Volatility of equity volatility



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

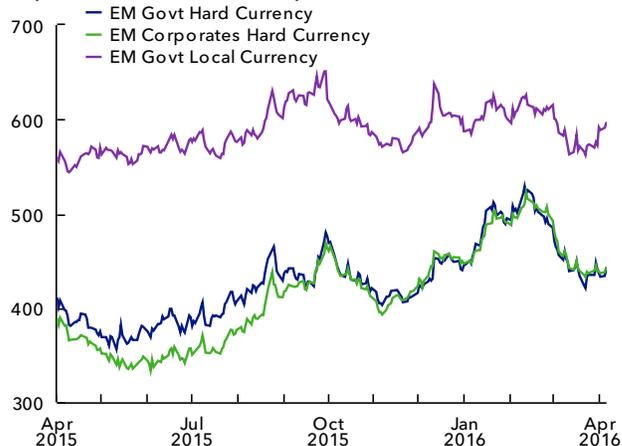


**Emerging market currencies**  
(foreign currency units per \$US)



Notes: Increasing values indicate weakening versus the U.S. Dollar. The J.P. Morgan EM Currency Index is inverted to provide the same interpretation as other currency indexes. Index 100=April 01, 2015.  
Source: Bloomberg L.P.

**Spreads to Treasuries (basis points)**



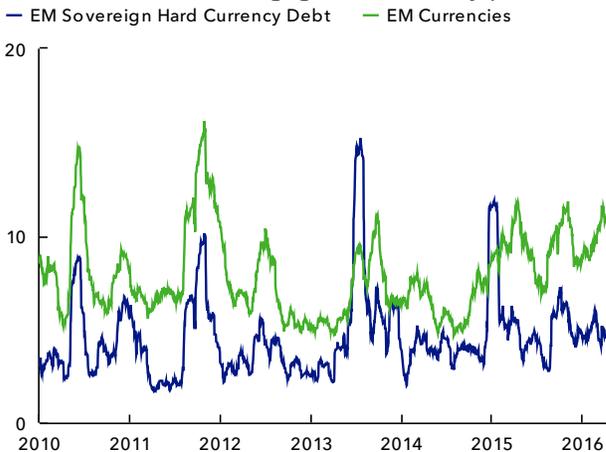
Notes: EM Government and Corporate Hard Currency spreads to worst are from the dollar-denominated J.P. Morgan Emerging Markets Bond Index Global and the J.P. Morgan Corporate Emerging Markets Bond Index. Government local currency spreads are the nominal yield difference between the J.P. Morgan Government Bond Index - Emerging Markets and the 5-year U.S. Treasury note.  
Source: Bloomberg L.P.

**Equity price indexes**



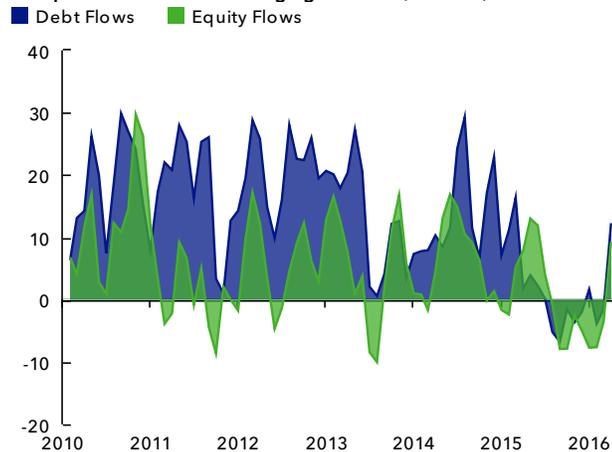
Notes: Note: Index 100 = April 01, 2015. The US equity index is the S&P 500 Index. The Chinese equity index is the Shanghai Composite Index. The Developed Economies index is the MSCI World Index and the Emerging Markets index is the MSCI EM Index (both are in local terms).  
Source: Bloomberg L.P.

**One-month realized emerging markets volatility (percent)**



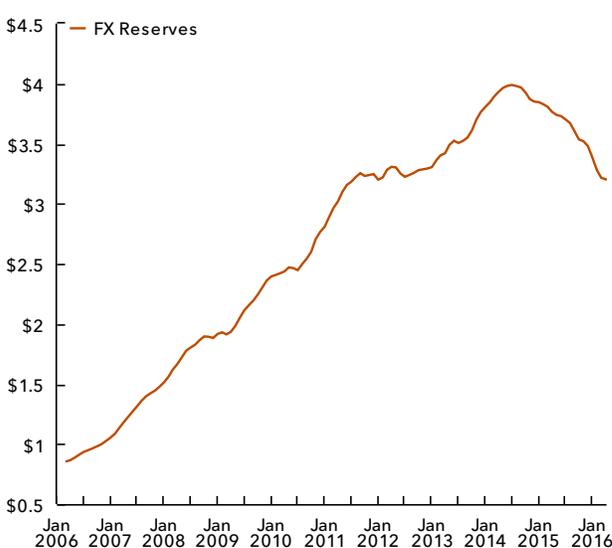
Notes: Realized volatility is the annualized standard deviation. Hard currency sovereign debt based on the J.P. Morgan Emerging Bonds - Global Price Index and currencies based on a weighted average of EM currency returns against the dollar using weights from J.P. Morgan VXY-EM currency volatility index.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

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



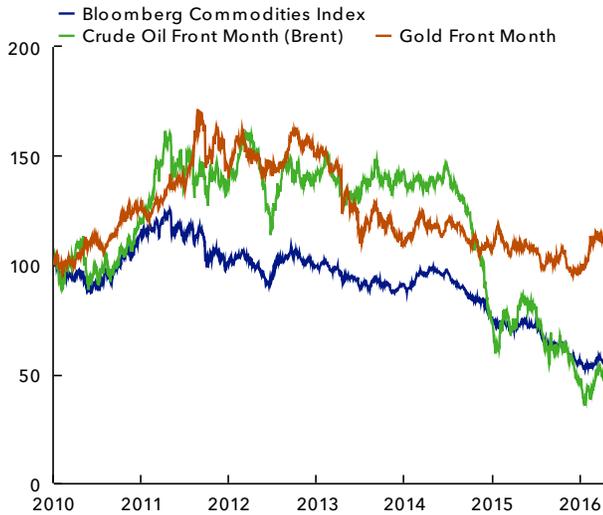
Notes: Data represents the Institute of International Finance's monthly estimates of non-resident flows into 30 EM countries. Data for latest observations are derived from IIF's empirical estimates using data from a smaller subset of countries, net issuance and other financial market indicators.  
Source: Bloomberg

**China's FX Reserves (\$ Trillion)**



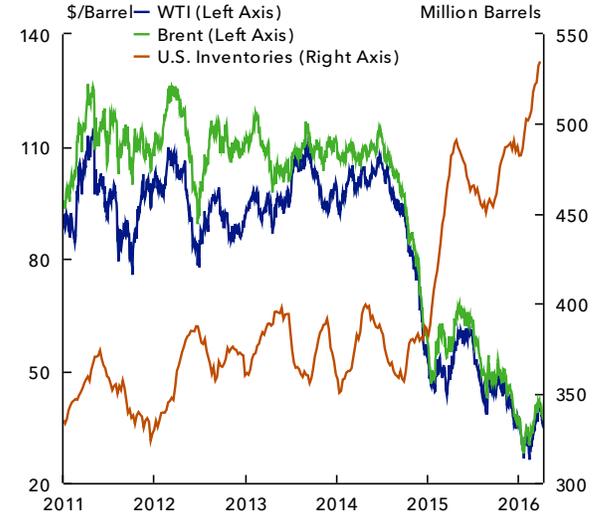
Source: Bloomberg

Major commodities prices



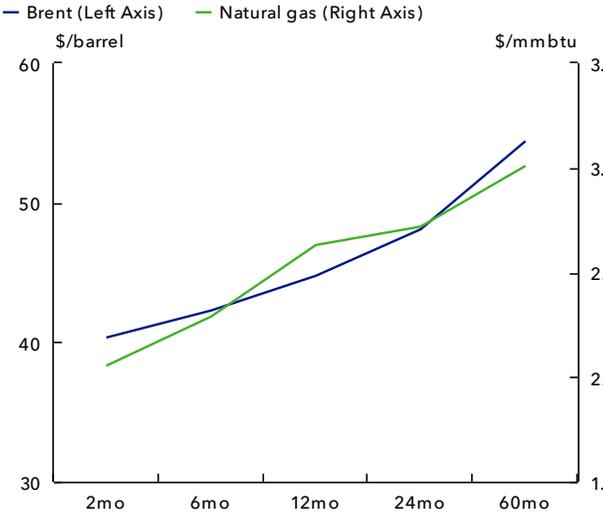
Notes: Index 100 = Jan 01, 2010  
Source: Bloomberg L.P.

Crude oil



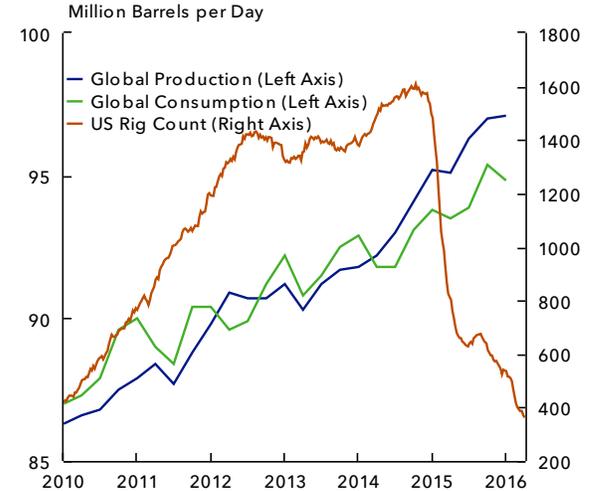
Notes: WTI and Brent are front-month contracts.  
Source: Bloomberg L.P.

Oil and natural gas futures curves



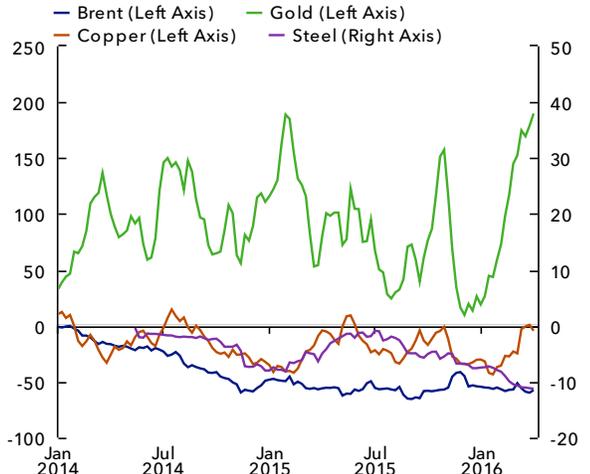
Notes: Data as of Mar 31st, 2016  
Source: Bloomberg L.P., OFR Analysis

Oil supply and demand factors



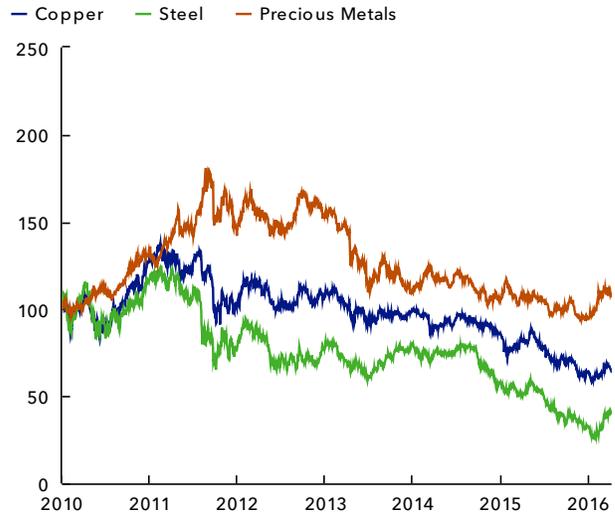
Notes: Global production and consumption are estimates by the International Energy Agency.  
Source: Bloomberg L.P.

Speculative futures positioning (thousands of contracts)



Notes: Positive values represent net long positions and negative values represent net short positions.  
Source: Bloomberg L.P.

Metals spot price indexes



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