OFR MARKETS MONITOR
OFFICE OF FINANCIAL RESEARCH

March 2015
(data as of March 25)

A monthly review of financial market developments

Divergent Monetary Policies Continue to Drive Market Trends

The divergence of global monetary policies remains a dominant theme in global financial markets. The Federal Reserve is widely expected to initiate a tightening cycle this year, its first since the global financial crisis. The European Central Bank (ECB), Bank of Japan, and a number of other central banks have moved in the opposite direction since late 2014, undertaking additional monetary easing. These actions have contributed to a nine-month appreciation of the U.S. dollar, rallies in Japanese and euro area risk assets, and compression of advanced economy bond yields, with yields now at unprecedented negative levels in many European markets. The expansion of quantitative easing programs and negative interest rates — which may be justified to prevent economic stagnation — entail financial stability risks that warrant monitoring and, where possible, mitigation.

Developments since last month

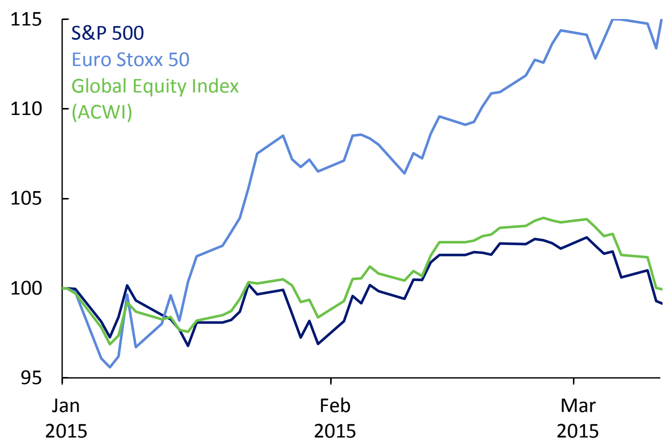
- The euro weakened further and euro area assets rallied as the ECB began its government bond purchases
- The U.S. dollar continued to appreciate; investor positioning and options suggest markets expect further gains
- U.S. Treasury yields declined and U.S. equity prices remained near record highs after the March Federal Reserve meeting, the statement and projections from which were considered more accommodative than expected
- Oil prices continued to trade near multiyear lows

Feature: *Quicksilver Markets* (p. 5)

The ECB's quantitative easing program has led to sizable moves in euro area assets, with spillovers elsewhere.

The ECB's expanded quantitative easing program has pushed the euro sharply weaker and driven a rally in euro area government bonds and equities. The ECB announced its highly anticipated government bond purchase program on January 22, responding to persistent economic weakness and disinflationary pressures. The market response began in advance of the announcement, and accelerated in March when the program was initiated. The euro has depreciated 9 percent year-to-date. German government bond yields have fallen more than 30 basis points, and are now negative across most short- and medium-term tenors. The Euro Stoxx 50 equity index has surged 17 percent over the same period, outperforming U.S. and other equity indexes (Figure 1).

Figure 1. Euro area equities outperform
(Index 100 = December 31, 2014)



Source: Bloomberg L.P.

Other European monetary authorities have also undertaken extraordinary easing in the face of currency and disinflationary pressures. Like the ECB,

This monitor reflects the OFR staff's best interpretation of financial market developments and views. It does not necessarily reflect a consensus of market participants and does not necessarily represent official positions or policy of the OFR or the U.S. Treasury. **Contributors:** Viktoria Baklanova, Ted Berg, Daniel Bresler, Daniel Maddy-Weitzman, Rebecca McCaughrin, Adam Minson, Thomas Piontek, Warren Reed, William Shi.

central banks in Switzerland, Denmark, and Sweden have cut policy rates to negative levels. Europe's negative policy rates and quantitative easing programs have driven unprecedented negative yields in European bond markets (Figure 2). Negative interest rates and asset purchase programs may lead to unintended consequences such as risk-underpricing, collateral and liquidity shortages in the purchased assets, and spillovers to foreign markets. While those may be considered justifiable costs to avoid economic stagnation or a deflation trap, they merit close monitoring and, where possible, mitigation.

Divergence between the Fed and other central banks has been a powerful market driver.

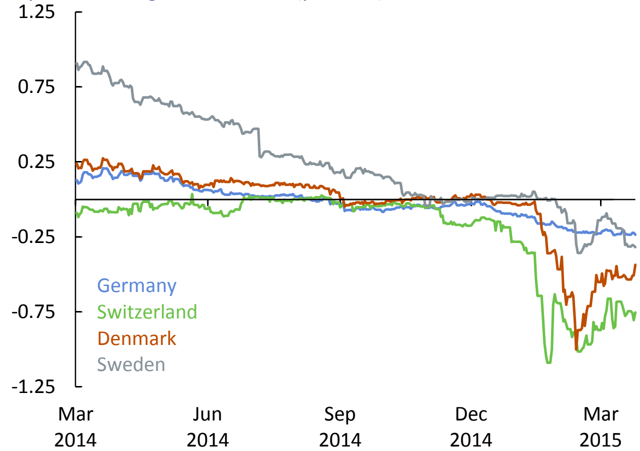
The Federal Reserve is widely expected to initiate monetary tightening later this year, even after accommodative signals at its March meeting. The Federal Open Market Committee's (FOMC) March statement took another step toward rate hikes, dropping its previous statement that "it can be patient" in beginning to normalize policy. However, most indications from the meeting and press conference suggest a gradual pace for tightening. The FOMC forecasts for growth, inflation, and the Fed policy rate were marked down notably. Even after this shift, the market continues to reflect lower interest rate expectations for 2016-17 than the median forecast of FOMC members, implying market risk if policy evolves in line with central FOMC expectations (Figure 3). The gap between the Fed's and market's expectations may reflect different views on inflation and growth. Market-based inflation expectations are notably lower since late 2014, while Federal Reserve officials tend to place more weight on survey-based inflation expectations, which have been more stable (Figure 4).

The divergence between Federal Reserve and ECB monetary policy was a central driver of the U.S. dollar's appreciation in March, extending the already sizable dollar strengthening that began in mid-2014. The broad U.S. dollar index appreciated 3 percent over the last month (Figure 5), bringing its total gains since June 2014 to 24 percent. Investor positioning and options pricing suggest that markets expect additional strengthening.

Amid broad U.S. dollar appreciation, some emerging market currencies are under intense pressure, reflecting macroeconomic and country-specific risks (Figure 5).

Figure 2. European bond yields in negative territory

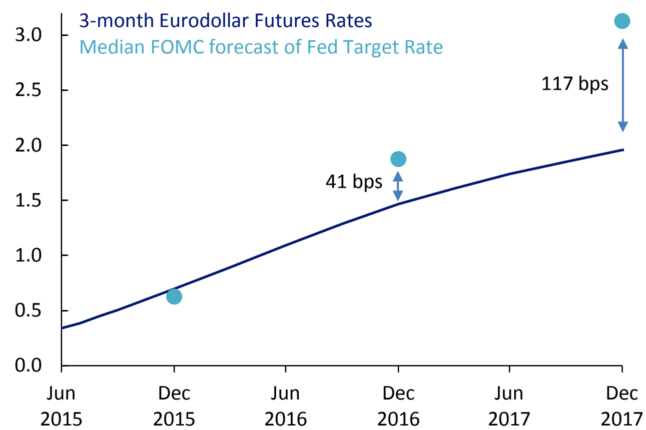
2-year Sovereign Bond Yields (percent)



Source: Bloomberg L.P.

Figure 3. Markets still more dovish than median FOMC forecast

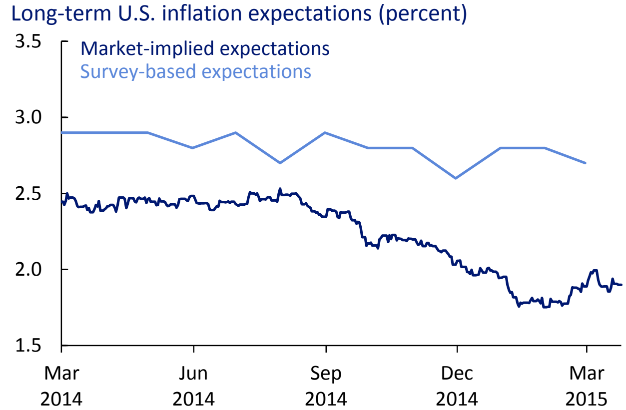
Eurodollar Futures and FOMC-member target rate forecasts



Source: Bloomberg L.P.

Figure 4. Survey-based inflation expectations more stable

Long-term U.S. inflation expectations (percent)



Note: Market-implied expectations measured as U.S. Treasury 5y5y forward breakeven inflation rate. Survey-based expectations from University of Michigan household survey: median expectations for average inflation during the next 5-10 years.

Source: Bloomberg L.P.

The Brazilian *real* depreciated more than 11 percent in the last month and 17 percent year-to-date, amid deteriorating macroeconomic data and concerns about corruption at the large state-owned oil company, Petrobras. The Turkish lira has fallen 10 percent year-to-date, partly in response to perceived risks to the central bank's autonomy. Russia's financial and economic crisis persists, though its currency rebounded somewhat in February and March. The U.S. dollar's appreciation poses additional risks for emerging market borrowers that financed heavily in U.S. dollars and do not have sufficient foreign currency income or reserves. Their creditors may be exposed to basis, liquidity, credit, and other risks that are difficult to hedge.

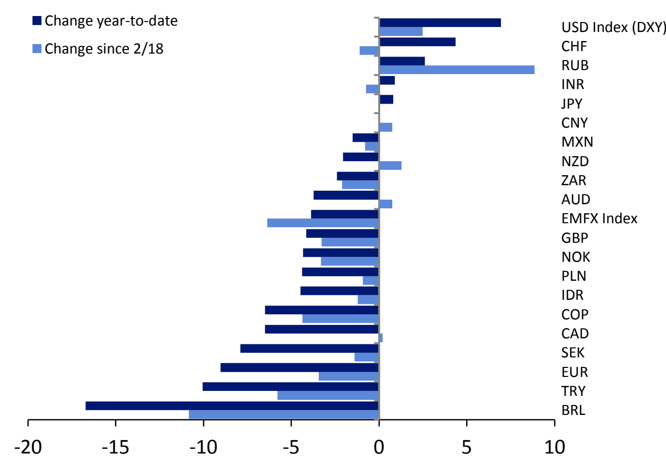
The widening gap between U.S. and euro area interest rates is also driving U.S. companies to issue more euro-denominated debt. The difference between U.S. and euro area investment grade corporate yields has widened to nearly 2 percent (Figure 6). U.S. companies have issued €34 billion of euro-denominated bonds year-to-date, which accounts for 20 percent of total euro-denominated corporate issuance. This is up considerably from 13 percent last year and the highest share since 2007 (Figure 7). This trend is expected to continue, as the gap between U.S. and euro area rates is anticipated to persist or widen amid the divergence in monetary policies.

Lower borrowing costs are not the only factor that leads U.S. companies to borrow offshore. Reportedly, most U.S. firms issuing in euros have euro revenues with which to service their bonds and have an incentive to match their funding sources. Nonetheless, the increased level of issuance and diverging borrowing costs warrants further monitoring, given that some U.S. companies may incur foreign exchange and interest rate risk by funding in euros.

Meanwhile, oil prices fell back toward multiyear lows...

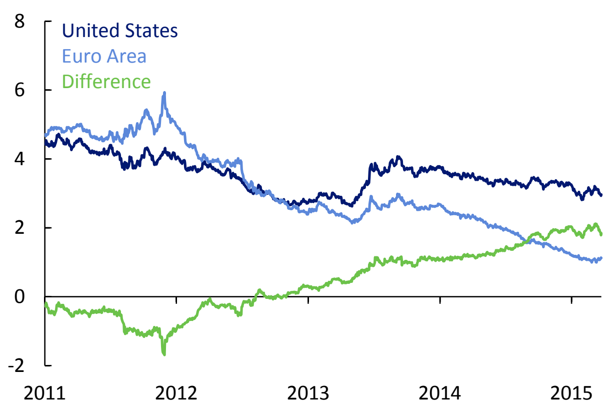
Oil prices came under renewed pressure in March, following news that U.S. oil inventories are at highly elevated levels (Figure 8). One contributor to the increase in inventories is the spike in oil price contango, which is the positive spread between the price of oil futures contracts and the expected price of oil at the time those contracts require oil delivery. Contango makes it profitable for traders to buy spot

Figure 5. The appreciating U.S. dollar
Value of FX in $US (percent)



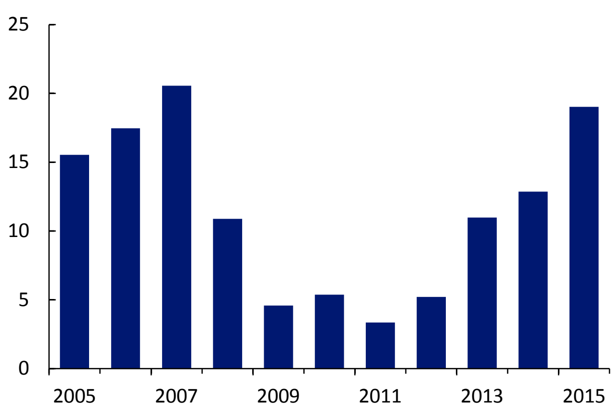
Sources: Bloomberg L.P.

Figure 6. Widening gap in corporate borrowing costs
Corporate Yields (percent)



Note: Corporate yields reported correspond to A-rated, 7 to 10 year maturity indexes for the U.S. and euro area.
Source: Bloomberg L.P.

Figure 7. Growing euro-denominated issuance by U.S. firms
Euro-denominated Corporate Bond Issuance: U.S. Firms/Total (percent)



Note: 2015 data as of March 19.
Source: Dealogic

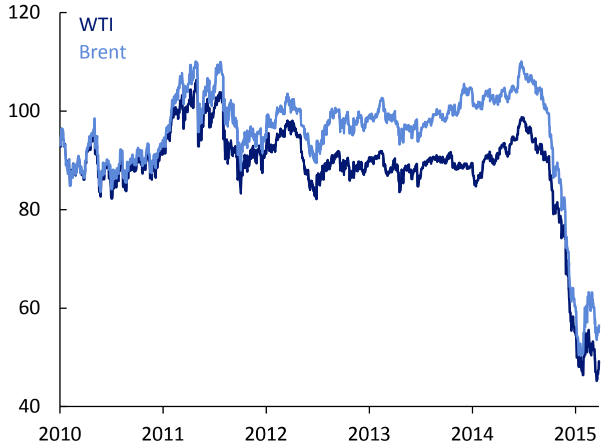
oil, hold it in inventory, and sell it forward for a net profit less storage costs.

…and U.S. equity prices remain at highly elevated levels.

U.S. equity indices were range-bound over the last month, at or near record highs (see feature, p. 5). The bull market in U.S. equities reached its sixth year of consecutive market gains in March (Figure 9). During this period, S&P 500 corporate profit margins have steadily increased, driving both earnings and stock prices higher. Quarterly margins reached a record 10 percent (non-GAAP) in Q3 2014; however profitability decreased in Q4 2014 due in part to U.S. dollar strength and weak energy firm earnings amid the descent in oil prices. A key uncertainty is whether the elevated S&P 500 profit margins prevailing in 2014 can be sustained throughout this year, particularly given the potential for rising U.S. labor costs.

Figure 8. Oil prices under pressure again

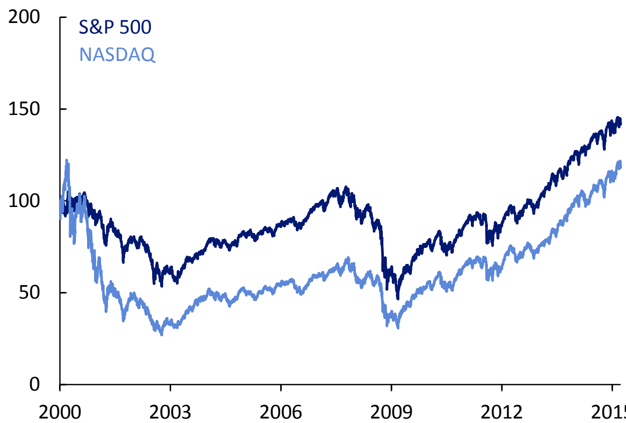
Crude Oil Prices ($US per barrel)



Source: Bloomberg L.P.

Figure 9. U.S. equities remain near record highs

Index 100 = January 1, 2000



Source: Bloomberg L.P.

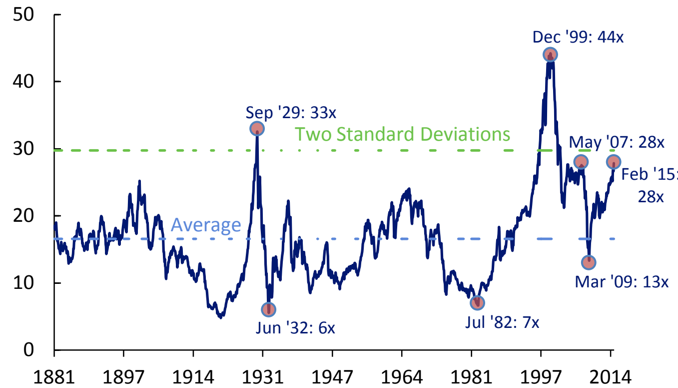
FEATURE: Quicksilver Markets

Certain fundamental valuation metrics used to evaluate U.S. stock prices are nearing extreme levels, defined here as two standard deviations above historical means. Overall, the available evidence suggests that the financial stability implications of a market correction could be moderate. (See the OFR brief Quicksilver Markets for more details.)

A key question is whether U.S. stock prices have run too far ahead of fundamentals. Corporate profit margins are at historic highs, but margins typically fall significantly when business cycles come to an end. Analysts currently expect high margins to persist throughout 2015. As a result, the market's forward price-to-earnings (PE) ratio is not alarmingly high relative to its historical averages. In contrast, other metrics — the cyclically adjusted PE ratio ("CAPE"), the Q-ratio, and the ratio of market value to GNP ("Buffett Indicator") — are very high by historical standards.

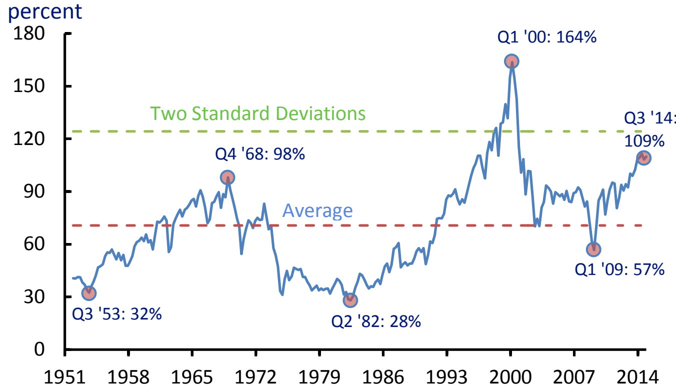
Although none of these valuation metrics predicts the timing of market inflection points, we can use these metrics as barometers to gauge when valuations are reaching excessive levels. More specifically, we define extreme levels as two standard deviations (two-sigma) above historical means. Valuations approached or surpassed two-sigma in each major stock market bubble of the past century, although extreme valuations can persist for extended periods. Currently, the CAPE ratio, the Q-ratio, and the Buffett Indicator are each approaching the two-sigma threshold (Figures 10, 11). The last time valuations were higher was during the technology stock bubble of the late 1990s.

Figure 10: Cyclically Adjusted Price-to-Earnings (CAPE) Ratio



Note: 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



Note: Q-ratio is the market value of nonfinancial corporate equities outstanding divided by net worth at market value.
Sources: Federal Reserve, OFR analysis

Extreme asset valuations can have implications for financial stability. Factors that can amplify or transmit the impact of equity market corrections are relevant to assessing the associated financial stability implications. Those factors include leverage, compressed pricing of risk, interconnectedness, and complexity.

Leverage. Leverage can magnify the impact of asset price movements. Leverage achieved through stock margin borrowing is above the historical average when measured relative to overall market capitalization. Other forms of leverage, such as securities lending and synthetic leverage achieved through derivatives, may also present risks.

Compressed pricing of risk. Asset prices based on compressed risk pricing are prone to drop, and severe drops may pose a risk to financial stability. Today's high valuation multiples imply that investors are willing to accept a much lower risk premium (and weaker-than-average stock returns) in the future. As stock prices appreciate materially during the latter stages of a bull market phase, risk pricing is compressed and implied equity risk premiums decrease, leaving investors with a smaller margin of safety.

Interconnectedness. The U.S. equity market is large ($24 trillion in market capitalization) and highly interconnected with other financial markets and the real economy. When stock market bubbles burst, they can adversely impact asset prices in other financial markets, particularly the corporate debt market, and they can adversely impact corporate and consumer spending. For very large corrections, such as that in the early 2000s, these negative consequences may be long-lasting.

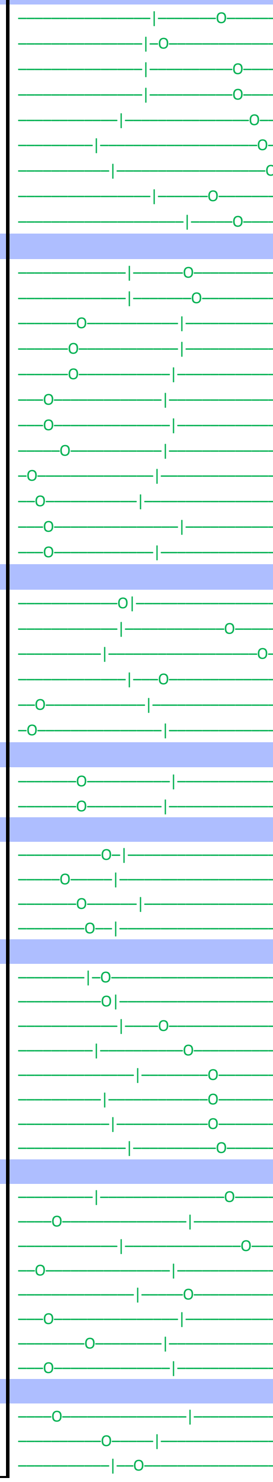
Complexity. The underlying plumbing, or market microstructure, of the U.S. equity market is highly complex and fragmented across many trading venues. That complexity may pose a risk if core market functions, such as price discovery and liquidity provisioning, are impaired during a period of broader market stress, such as when an asset bubble bursts. For example, market price movements may be amplified by aggressive automated-based high frequency trading, which can trigger a chain reaction of selling.

Although overall equity valuations appear high today, the relevance of the financial stability risks previously noted may come down to valuations of financial sector stocks. Today, valuations for financial stocks appear more reasonable.

Overall, the available evidence suggests that the financial stability risks associated with a correction to high equity valuations could be moderate at present. The equity market and the amplifying factors discussed above bear close monitoring.

Selected Global Asset Price Developments

	LATEST LEVEL (3/25/2015)	1M CHANGE (bps or %)	1M CHANGE (standard deviations)*	YTD CHANGE (bps or %)	12-MONTH RANGE**
EQUITIES					
S&P 500	2061	-2.5%	-0.7	0.1%	
U.S. KBW Bank Index	72	-1.9%	-0.4	-3.7%	
Russel 2000	1234	-0.1%	-0.2	2.4%	
Nasdaq	4877	-1.8%	-0.4	3.0%	
Euro Stoxx 50	3684	4.0%	0.6	17.1%	
Shanghai Composite	3661	13.4%	1.0	13.2%	
Nikkei 225	19746	6.2%	1.1	13.2%	
Hang Seng	24528	-1.0%	-0.2	3.9%	
FTSE All World	282	-1.2%	-0.4	2.8%	
RATES					
U.S. 2-Year Yield	0.60%	0	0.1	-6	
U.S. 2-Year Swap Rate	0.84%	-1	0.0	-6	
U.S. 10-Year Yield	1.93%	-4	-0.1	-25	
U.S. 10-Year Swap Rate	2.02%	-8	-0.2	-26	
U.S. 30-Year Yield	2.51%	-6	-0.2	-24	
U.S. 2y10y Spread	132	-4	-0.2	-18	
U.S. 5Y5Y Inflation Breakeven	1.89%	-2	-0.1	-25	
U.S. 5Y5Y Forward Rate	2.50%	-5	-0.1	-26	
Germany 10-Year Yield	0.22%	-11	-0.4	-32	
Japan 10-Year Yield	0.33%	-1	0.0	0	
U.K. 10-Year Yield	1.48%	-24	-0.9	-28	
Germany 5Y5Y Inflation Breakeven	1.77%	-25	-1.0	-9	
FUNDING					
1M T-Bill Yield	0.02%	1	0.1	1	
DTCC GCF Treasury Repo	0.21%	14	1.4	-4	
3M Libor	0.27%	1	0.1	1	
Libor-OIS Spread	14	1	0.0	1	
3M Eurodollar Sep 2016 Mid Yield	0.51%	-4	0.0	-15	
EURUSD 3M CCY Basis Swap	-24	-5	-0.2	-10	
U.S. MBS					
FNMA Current Coupon	2.68%	-6	-0.2	-15	
FHLMC Primary Rate	3.78%	2	0.1	-5	
CREDIT					
CDX Investment Grade 5-Year CDS Spread	63	1	0.0	-4	
CDX High Yield 5-Year CDS Spread	312	-16	-0.1	-45	
CDX Itraxx Euro 5-Year CDS Spread	56	4	0.3	-7	
U.S. 5-Year Sovereign CDS Spread	17	0	-0.1	-1	
IMPLIED VOLATILITY					
VIX Index	15	11.6%	0.5	-19.6%	
V2X Index	19	7.5%	0.3	-26.8%	
VDAX Index	18	16.3%	0.8	-6.1%	
MOVE Index	84	-8.0%	-0.6	22.1%	
3M2Y Swaption Volatility	63	-2.5%	-0.2	-7.1%	
3M10Y Swaption Volatility	86	2.0%	0.1	16.2%	
DB G10 FX Volatility Index	11	18.6%	1.6	12.6%	
JPM EMFX Volatility Index	10	6.8%	0.4	-4.2%	
FOREIGN EXCHANGE & COMMODITIES					
U.S. Dollar Index***	97	2.9%	1.3	7.4%	
EUR/USD	1.10	-3.4%	-1.2	-9.3%	
USD/JPY	119	0.5%	0.1	-0.2%	
GBP/USD	1.49	-4.2%	-1.8	-4.5%	
USD/CHF	0.96	1.2%	0.4	-3.5%	
Brent Crude	56	-9.4%	-1.7	-6.2%	
Gold	1195	-0.8%	-0.3	0.9%	
S&P GSCI Commodities Index	405	-3.3%	-0.6	-3.2%	
EMERGING MARKETS					
JPM EMFX Index	75	-1.0%	-0.4	-4%	
MSCI Emerging Market Equity Index	976	-1.7%	-0.3	2.1%	
CDX EM 5-Year CDS Spread	316	-61	-1.2	-19	



* 1M Change standard deviations based on monthly 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 USD and major world currencies.
Sources: Bloomberg L.P., OFR analysis