



Invested in America

RESEARCH QUARTERLY

Fourth Quarter 2016

RESEARCH REPORT

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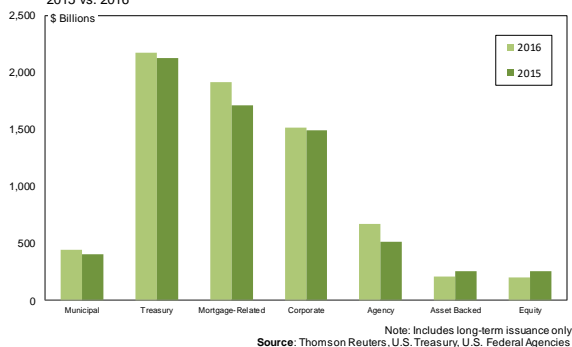
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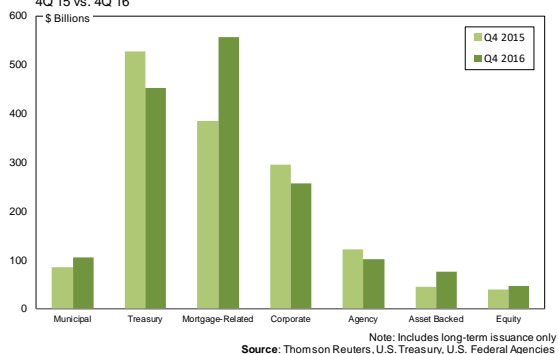
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CAPITAL MARKETS OVERVIEW

Issuance in U.S. Capital Markets
2015 vs. 2016



Issuance in U.S. Capital Markets
4Q'15 vs. 4Q'16



Issuance Highlights - Year-Over-Year⁽¹⁾

\$ Billions	2016:Q4	2015:Q4	% Change
Municipal	104.9	84.7	23.9%
Treasury	451.6	527.3	-14.4%
Mortgage-Related	557.3	384.0	45.1%
Corporate	257.5	294.9	-12.7%
Federal Agency	101.4	121.5	-16.5%
Asset-Backed	76.4	45.3	68.4%
Equity	46.4	39.8	16.5%

Issuance Highlights - Quarter-Over-Quarter⁽¹⁾

\$ Billions	2016:Q4	2016:Q3	% Change
Municipal	104.9	115.4	-9.1%
Treasury	451.6	548.0	-17.6%
Mortgage-Related	557.3	549.3	1.5%
Corporate	257.5	422.7	-39.1%
Federal Agency	101.4	229.3	-55.8%
Asset-Backed	76.4	75.5	1.2%
Equity	46.4	54.7	-15.2%

⁽¹⁾ Includes long-term issuance only

Total Capital Markets Issuance

Long-term securities issuance totaled \$1.56 trillion in 4Q'16, a 21.1 percent decrease from \$2.0 trillion in 3Q'16 but a 6.5 percent increase year-over-year (y-o-y) from \$1.50 trillion. Issuance decreased quarter-over-quarter (q-o-q) across all asset classes but mortgage-related and asset-backed securities; y-o-y, growth was positive in municipal, mortgage-related, asset-backed and equity classes. For the full year 2016, capital markets long-term issuance totaled \$7.19 trillion, up 6.5 percent from \$6.75 trillion in 2015.

Long-term public municipal issuance volume including private placements for 4Q'16 was \$104.9 billion, down 9.1 percent from \$115.4 billion in 3Q'16. Full year 2016 issuance was \$445.8 billion, an increase of 10.6 percent from \$403.1 billion in 2015.

Total gross issuance of Treasury bills and coupons, including cash management bills, Floating Rate Notes and Treasury Inflation-Protected Securities, was \$2.10 trillion in 4Q'16, down 1.8 percent from \$2.14 trillion in 3Q'16 but a 15.9 percent increase from \$1.81 trillion in 4Q'15. For the full year 2016, gross issuance of Treasury securities totaled \$8.30 trillion, up 18.8 percent from \$7.00 trillion in 2015.

Long-term federal agency debt issuance was \$101.4 billion in the fourth quarter, a 55.8 percent decrease from \$229.3 billion in 3Q'16 and a 16.5 percent decrease from \$121.5 billion issued in 4Q'15. For the full year 2016, issuance was \$673.0 billion, up 31.0 percent from \$513.5 billion in 2015.

Issuance of mortgage-related securities, including agency and non-agency passthroughs and collateralized mortgage obligations, totaled \$557.3 billion in the fourth quarter, a 1.5 percent increase from 3Q'16 (\$549.3 billion) and a 45.1 percent increase y-o-y (\$361.9 billion). For the full year 2016, mortgage-related securities issuance was \$1.9 trillion, an increase of 15.9 percent from 2015.

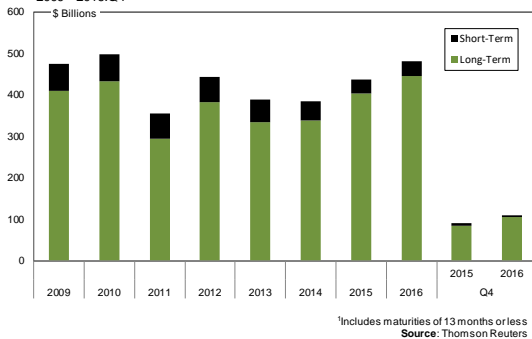
Asset-backed securities issuance totaled \$76.4 billion in the fourth quarter, an increase of 1.2 percent q-o-q and 36.3 percent y-o-y. For the full year, issuance was \$275.4 billion, a decline of 11.7 percent from the prior year.

Corporate bond issuance totaled \$257.5 billion in 4Q'16, down 39.1 percent from \$422.7 billion issued in 3Q'16 and 12.7 percent from 4Q'15's issuance of \$294.9 billion. For the full year 2016, corporate bond issuance increased to \$1.52 trillion, up 1.8 percent from \$1.49 billion in 2015.

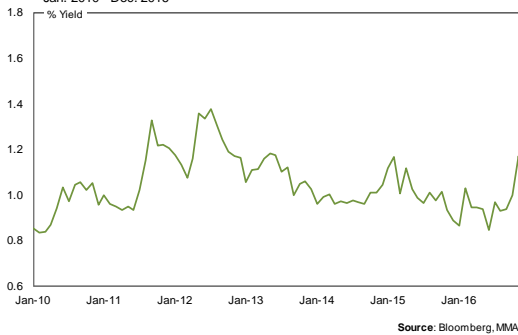
Equity underwriting decreased by 15.2 percent to \$46.4 billion in the fourth quarter from \$54.7 billion in 3Q'16 but increased by 16.5 percent from \$39.8 billion issued in 4Q'15. For the full year 2016, equity underwriting totaled \$197.0 billion, 23.3 percent below the \$256.8 billion in 2015.

MUNICIPAL BOND MARKET

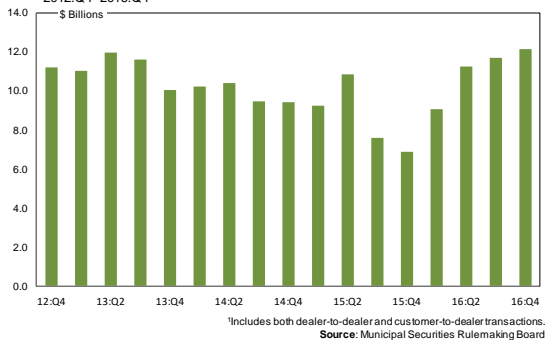
Short- and Long-Term Municipal Issuance
2009 - 2016:Q4



Municipal GO AAA and 10-Yr Treasury Ratio
Jan. 2010 - Dec. 2016



Average Daily Trading Volume of Municipal Securities¹
2012:Q4 - 2016:Q4



Long-term public municipal issuance volume totaled \$100.3 billion in the fourth quarter of 2016, a decline of 7.5 percent from the prior quarter (\$108.5 billion) but an increase of 31.1 percent year-over-year (y-o-y) (\$76.5 billion). Including private placements (\$4.5 billion), long-term municipal issuance for 4Q'16 was \$104.9 billion. Despite the fourth quarter decline, full year issuance was \$423.8 billion, an increase of 12.2 percent from 2015 and well above the 10-year average of \$372.0 billion. Including private placements, full year issuance was \$445.8 billion.

Tax-exempt issuance totaled \$91.2 billion in 4Q'16, a decline of 7.3 percent q-o-q but an increase of 35.2 percent y-o-y. For the full year, tax-exempt issuance was \$383.1 billion, an increase of 13.2 percent from the prior year. Taxable issuance totaled \$7.3 billion in 4Q'16, a decline of 7.3 percent q-o-q but an increase of 40.0 percent y-o-y. For the full year, taxable issuance was \$28.5 billion, an increase of 2.2 percent from 2015. AMT issuance was \$1.9 billion in 4Q'16, a decline of 18.4 percent q-o-q and 52.1 percent y-o-y. For the full year, AMT issuance was \$12.2 billion, 8.1 percent above 2015 volumes.

By use of proceeds, general purpose led issuance totals in 4Q'16 (\$22.7 billion), followed by primary & secondary education (\$19.0 billion), and water & sewer (\$10.7 billion). For the full year, general purpose led issuance totals (\$103.7 billion), followed by primary & secondary education (\$81.9 billion), and water & sewer (\$44.1 billion).

Refunding volumes comprised 46.6 percent of issuance in 4Q'16, declining slightly from the prior quarter (52.3 percent) but was an increase year-over-year (43.5 percent). For the full year, refunding volumes comprised 50.7 percent of all issuance, down slightly from 2015 (51.8 percent).

Yields, Inflows, and Total Return

Ratios of 10-year tax-exempt AAA GOs and similar-maturity Treasuries rose in the fourth quarter on a q-o-q basis and a y-o-y basis, averaging at 97.2 percent in 4Q'16 from 93.3 percent in 3Q'16 and 95.7 percent in 4Q'15.

According to the Investment Company Institute (ICI), fourth quarter net flow into long-term municipal funds was negative, with \$24.9 billion of outflow in 4Q'16 compared to \$16.5 billion of outflow from 3Q'16 and \$10.6 billion of inflow y-o-y. For the full year, approximately \$25.2 billion of inflow was recorded, up from the \$14.8 billion of inflow from the prior year.

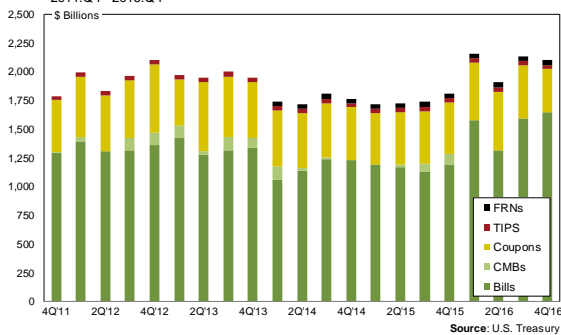
According to Bank of America-Merrill Lynch indices, municipals lost 3.5 percent in the fourth quarter of 2016 but returned 0.4 percent in the full year.

Trading Activity and Broker-Dealers

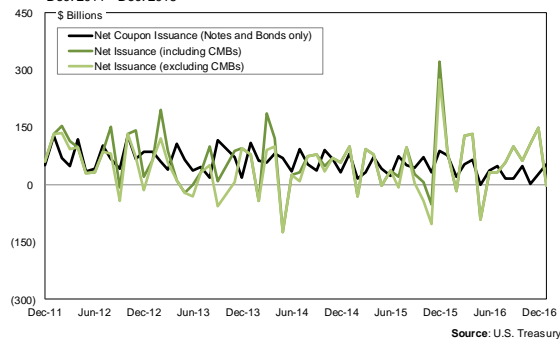
Trading activity rose q-o-q to \$12.1 billion daily in 4Q'16, a 3.9 percent increase from 3Q'16 (\$11.7 billion) and 77.0 percent from 4Q'15 (\$6.9 billion). By number of trades, trading activity also rose on a q-o-q and y-o-y basis, rising 23.1 percent and 24.2 percent y-o-y. For the full year, average trading daily volume by dollar volume was \$11.1 billion, an increase of 28.4 percent from 2015 (\$8.6 billion daily); by number of trades, average daily volume was 36,964 trades, an increase of 1.0 percent from 2015.

TREASURY MARKET

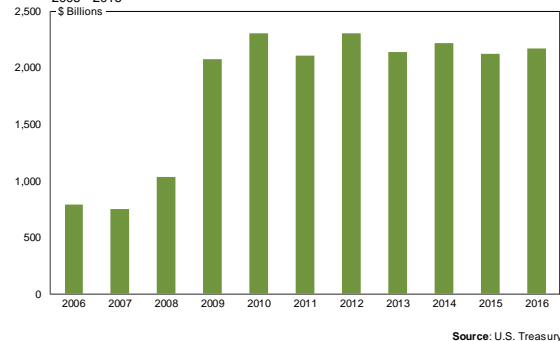
Quarterly Gross Issuance of U.S. Treasury Securities
2011:Q4 - 2016:Q4



Net Issuances of Treasury Marketable Debt
Dec. 2011 - Dec. 2016



Gross Issuance of U.S. Treasury Marketable Coupon Securities
2006 - 2016



Gross Issuance of U.S. Treasury Securities

Total gross issuance of Treasury bills and coupons, including cash management bills (CMBs), Floating Rate Notes and Treasury Inflation-Protected Securities, was \$2.10 trillion in 4Q'16, down 1.8 percent from \$2.14 trillion in 3Q'16 but a 15.9 percent increase from \$1.81 trillion in 4Q'15. For the full year 2016, gross issuance of Treasury securities totaled \$8.30 trillion, up 18.8 percent from \$7.00 trillion in 2015. Treasury net issuance, including CMBs, increased to \$254.9 billion in the fourth quarter, up 14.6 percent from \$222.4 billion in the previous quarter but down 27.9 percent from \$353.6 billion in 4Q'15. Fourth quarter net issuance was 35.6 percent above the Treasury's net estimate of \$188.0 billion.¹ For the full year 2016, Treasury net issuance was \$696.7 billion, a slight increase from \$684.2 billion in 2015.

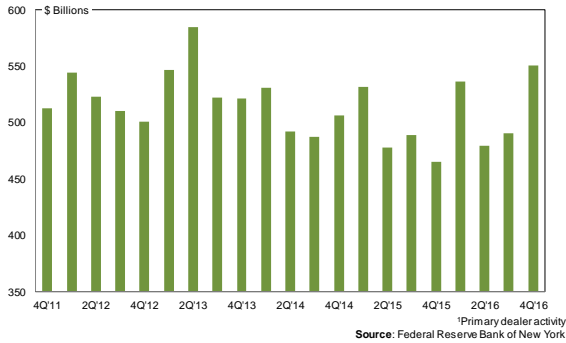
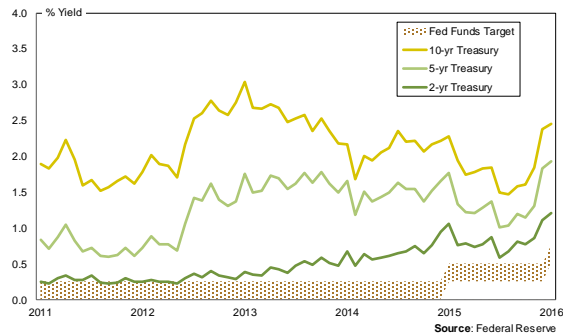
No CMBs were issued in 4Q'16, a decrease from \$25.0 million in 3Q'16 and from \$95.0 billion in 4Q'15. For the full year 2016, issuance of CMBs declined to \$25.0 million from \$200.0 billion in 2015.

In the fourth quarter, \$451.6 billion in Treasury coupons, FRNs and TIPS were issued, down 17.6 percent from \$548.0 billion issued in the prior quarter and 14.4 percent below \$527.3 billion in 4Q'15. For the full year 2016, Treasury coupons, FRNs and TIPS issuance totaled \$2.17 trillion, an increase of 2.2 percent from \$2.11 trillion in 2015.

Excluding TIPS and FRNs, total gross issuance of Treasury marketable coupon securities was \$378.3 billion, down 18.7 percent from \$465.5 billion issued in 3Q'16 and 16.0 percent below the \$450.3 billion issued in 4Q'15. Net coupon issuance was \$83.9 billion, a 0.6 percent increase from \$85.4 billion in 3Q'16 but down 57.6 percent y-o-y. For the full year 2016, Treasury marketable coupon issuance totaled \$1.85 trillion, 2.8 percent above \$1.80 trillion in 2015.

In 4Q'16, \$41.9 billion in FRNs was issued, down 2.2 percent from \$42.8 billion in 3Q'16 but up 2.2 percent from \$41.0 billion in 4Q'15. The demand for FRNs stayed high with an average bid-to-cover ratio of 3.5, unchanged from the previous quarter and up from 3.2 from 4Q'15. For the full year 2016, FRN issuance totaled \$171.0 billion, an increase of 4.2 percent from \$164.1 billion in 2015.

¹ Treasury's October borrowing estimates can be found [here](#).

Average Daily Trading Volume of Treasury Securities¹
2011:Q4 - 2016:Q4Treasury Yields and Target Fed Fund Rate
Dec. 2011 - Dec. 2016

Trading Activity

Daily trading volume of Treasury securities by primary dealers averaged \$550.8 billion in 4Q'16, a 12.3 percent increase from \$490.6 billion in the previous quarter and an 18.4 percent increase from the \$465.3 billion traded daily in 4Q'15. For the full year 2016, the average daily trading volume stood at \$514.2 billion, up 4.9 percent from \$490.1 billion in 2015.

Treasury Yield Curve

After the federal funds rate increase in December 2016, the Treasury yields increased in 4Q'16 for all maturities, with larger increases in short- and medium-term securities. Two-year rates increased to 1.20 percent, up from 0.77 percent end-September and from 1.05 percent end-December 2015. Five-year yields increased to 1.93 percent end-December from 1.14 percent end-September and from 1.76 percent end-2015. Ten-year yields increased to 2.45 percent from 1.60 percent and 2.27 percent in September 2016 and December 2015, respectively; and 30-year yields ended the year at 3.06 percent, up from 2.32 percent end-September and from 3.01 percent end-December 2015.

FOMC Meeting Summary

During its December 2016 meeting, the Federal Reserve's Federal Open Market Committee raised its target federal rate range from 0.25-0.50 percent to 0.50-0.75 percent, the second rate hike in 10 years.² In its most recent meeting, the FOMC confirmed that its stance of monetary policy remains accommodative, thereby supporting some further strengthening in labor market conditions and a return to 2 percent inflation. The Committee also announced that it is maintaining its existing policy of reinvesting principal payments from its holdings of

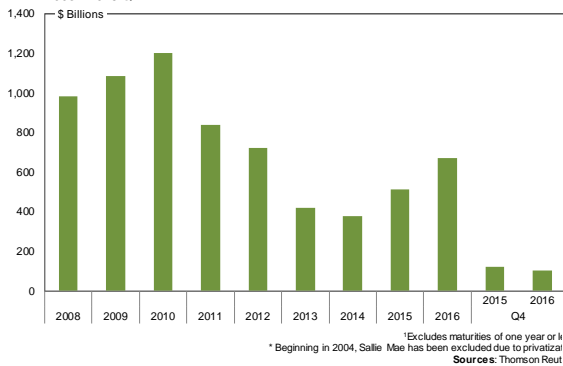
agency debt and agency mortgage-backed securities in agency mortgage-backed securities and of rolling over maturing Treasury securities at auction until normalization of the level of the federal funds rate is well under way. The FOMC forecasted that economic conditions will evolve in a manner that will warrant only gradual increases in the federal funds rate; the federal funds rate is likely to remain, for some time, below levels that are expected to prevail in the longer run.³

² [Statement from the FOMC Meeting](#), December 14, 2016.

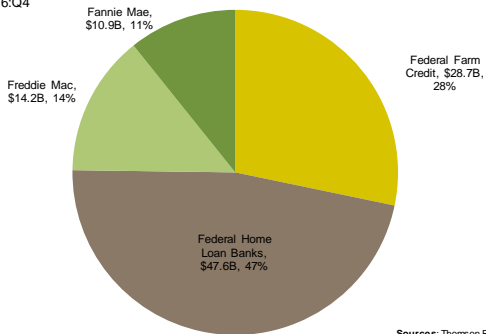
³ [Statement from the FOMC Meeting](#), February 1, 2017.

FEDERAL AGENCY DEBT MARKET

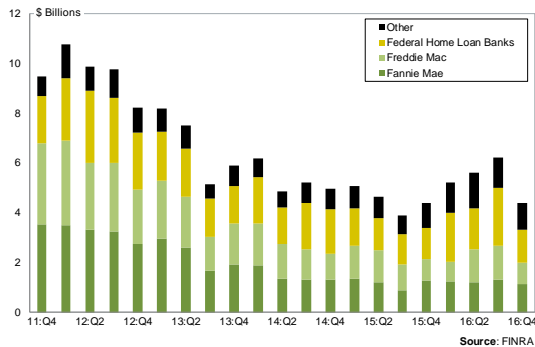
Long-Term Federal Agency Debt Issuance¹
2008 - 2016:Q4



Long-Term Federal Agency Debt Issuance by Agency
2016:Q4



TRACE Average Daily Trading Volume - Federal Agency Securities
2011:Q4 - 2016:Q4



Federal agency long-term debt (LTD) issuance was \$101.4 billion in the fourth quarter, a 55.8 percent decrease from \$229.3 billion in 3Q'16 and 16.5 percent decrease from \$121.5 billion issued in 4Q'15. For the full year 2016, LTD issuance was \$673.0 billion, up 31.0 percent from \$513.5 billion in 2015.

Fannie Mae's 4Q'16 gross debt issuance, both short term debt (STD) and LTD, totaled \$150.8 billion, a decrease of 6.0 percent from \$185.6 billion in 3Q'16. STD issuance decreased to \$132.8 billion compared with \$136 billion in 3Q'16 while LTD issuance decreased to \$18.0 billion in 4Q'16 from \$48.9 billion in 3Q'16. Fannie Mae had \$35.0 billion in STD outstanding and \$293.8 billion LTD outstanding at the end of 4Q'16.

Freddie Mac's gross debt issuance totaled \$127.7 billion in 4Q'16, a decrease of 19.3 percent from \$158.4 billion in 3Q'16. As of quarter-end, Freddie Mac had \$61.1 billion STD and \$373.7 billion LTD outstanding, in comparison with \$69.5 billion STD and \$303.5 billion LTD in the prior quarter.

The 12 Federal Home Loan Banks (FHLB) issued \$45.2 billion in LTD in the fourth quarter, a decrease of 52.4 percent from \$95.0 billion in 3Q'16. In 4Q'16, \$1,173.1 billion of short-term debt (STD) was issued, up from \$1,073.6 billion issued in 3Q'16, driven primarily by discount note issuance. Total FHLB LTD outstanding was \$579.2 billion at quarter-end, up from \$532.9 billion outstanding at the end of third quarter and up from \$410.9 billion y-o-y. Discount notes decreased to \$410.1 billion in 4Q'16 from \$434.8 billion in 3Q'16 and decreased y-o-y from \$494.3 billion in 4Q'15.

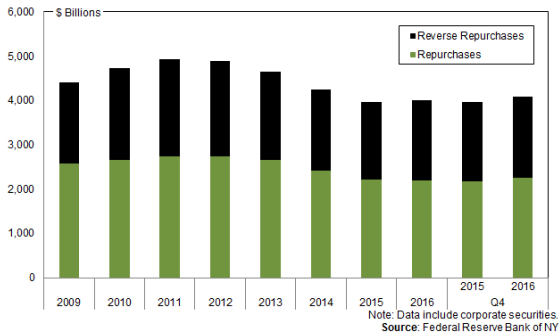
Total Farm Credit System gross debt issuance for 4Q'16 totaled \$ 334.0 billion. Total debt outstanding at year end was \$257.9 billion, of which \$29.6 billion was short-term and \$228.3 billion was long-term compared to \$31.4 billion short-term and \$210.8 billion long-term in the prior quarter.

Trading Activity

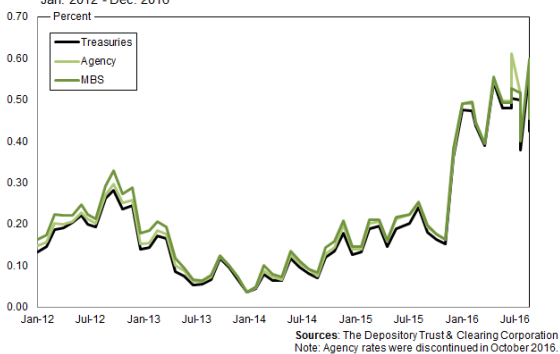
Average daily trading volume of agency securities in the fourth quarter was \$4.4 billion, down 13.2 percent from \$6.2 billion traded in 3Q'16 and down 10.9 percent from \$4.40 billion traded in 4Q'15.

FUNDING AND MONEY MARKET INSTRUMENTS

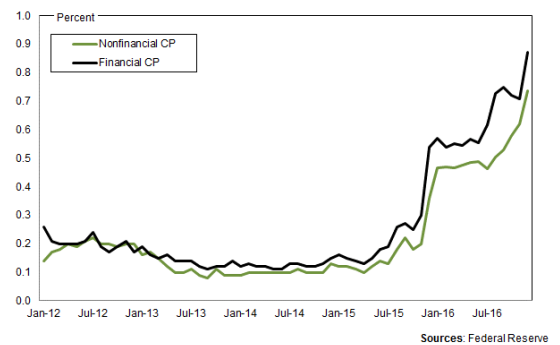
Financing by U.S. Government Securities Dealers
Average Daily Amount Outstanding
2009 - 2016:Q4



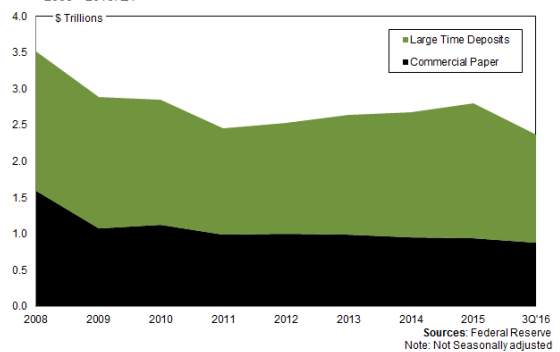
DTCC GCF Repo Index™
Jan. 2012 - Dec. 2016



Financial & Nonfinancial Commercial Paper 3-Month Interest Rates
Jan. 2012 - Dec. 2016



Outstanding Money Market Instruments
2008 - 2016:Q4



Total Repurchase Activity

The average daily amount of total repurchase (repo) and reverse repo agreement contracts outstanding was \$4.09 trillion in 4Q'16, an increase of 0.9 percent from 3Q'16's \$4.05 trillion and an increase of 3.2 percent y-o-y. For the full year, the average daily amount of total repo and reverse repo agreements was \$4.01 trillion daily.

Average daily outstanding repo transactions totaled \$2.25 trillion in 4Q'16, an increase of 0.9 percent and 3.2 percent, respectively, q-o-q and y-o-y. Reverse repo transactions in 4Q'16 averaged \$1.84 trillion daily outstanding, an increase of 0.9 percent and 3.2 percent q-o-q and y-o-y, respectively.

GCF Repo Rates

DTCC general collateral finance (GCF) repo rates declined for Treasuries and MBS in 4Q'16 on a q-o-q basis although was up on a y-o-y basis: the average repo rate for Treasuries (30-year and less) fell to 43.5 basis points (bps) from 3Q'16's average rate of 51.7 bps and 4Q'15's average of 23.0. The average MBS repo rate declined to 46.0 bps from 53.6 bps in the previous quarter and 24.5 bps in 4Q'15.

Financial and Nonfinancial 3-Month Commercial Paper Interest Rates

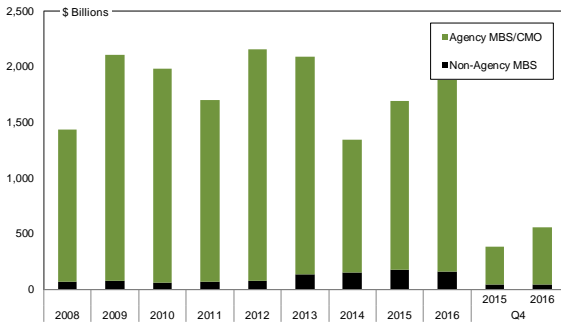
Interest rates for nonfinancial commercial paper (CP) rose to 74 bps end-December 2016 from 53 bps end-September 2016 and from 36 bps end-December 2015, while financial CP rose to 87 bps end-December from 75 bps end-September and from 54 bps end-December 2015.

Total Money Market Instruments Outstanding

Preliminary outstanding volume of total money market instruments (MMI), including CP and large time deposits, stood at \$2.37 trillion at the end of the fourth quarter, down 2.0 percent from the prior quarter's \$2.42 trillion and 15.4 percent y-o-y. CP outstanding totaled approximately \$884.9 billion in 4Q'16, a 2.9 percent decline from the \$911.3 billion in 3Q'16 and a 6.0 percent decline y-o-y. Large time deposits outstanding totaled \$1.49 trillion in 4Q'16, a decline of 1.4 percent from 3Q'16 and 20.2 percent y-o-y.

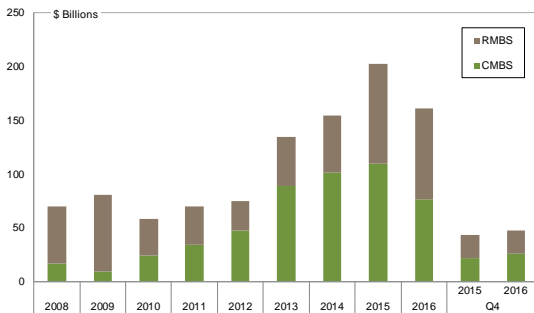
MORTGAGE-RELATED SECURITIES

Issuance of Mortgage-Related Securities
2008 - 2016:Q4



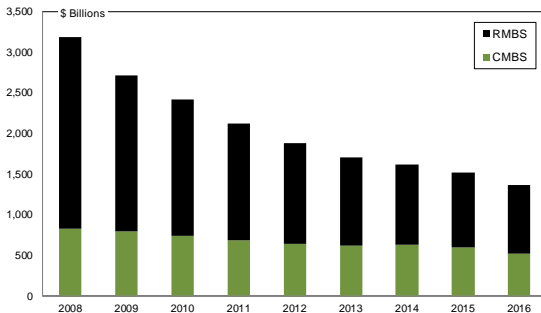
Sources: Federal Agencies, Thomson Reut

Issuance of Non-Agency Mortgage-Backed Securities
2008 - 2016:Q4



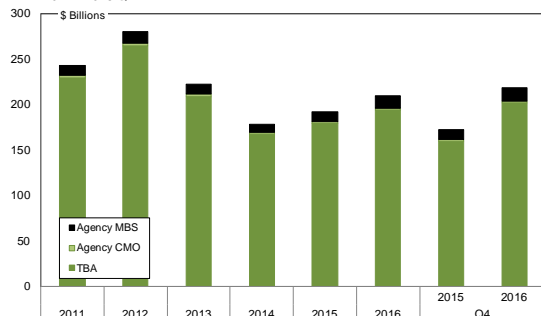
Sources: Bloomberg, Thomson Reuters

U.S. Non-Agency Securities Outstanding
2008 - 2016



Sources: Bloomberg, Thomson Reuters, SIFMA

Average Daily Trading Volume - Agency Mortgage-Related Securities
2011 - 2016:Q4



Source: FINRA TRACE

Mortgage-Related Issuance

Issuance of mortgage-related securities, including agency and non-agency passthroughs and collateralized mortgage obligations (CMOs), totaled \$557.3 billion in the fourth quarter, a 1.5 percent increase from 3Q'16 (\$549.3 billion) and a 45.1 percent increase y-o-y (\$361.9 billion). Both agency and non-agency volumes rose q-o-q, rising 1.2 percent and 4.0 percent, respectively. Overall, the agency share of issuance fell slightly to represent 91.5 percent of total issuance in 4Q'16 from 91.7 percent in the prior quarter. For the full year, mortgage-related securities issuance was \$1.9 trillion, an increase of 15.9 percent from the prior year, stemming entirely from agency issuance, which rose 15.9 percent from the prior year while non-agency volumes fell 19.3 percent.

Agency Issuance

Agency mortgage-related issuance totaled \$509.7 billion in 4Q'16, an increase of 1.2 percent and 49.5 percent, respectively, from 3Q'16 (\$503.5 billion) and 4Q'15 (\$340.9 billion). For the full year, agency mortgage-related issuance was \$1.75 trillion, up 15.9 percent from 2015's \$1.51 trillion.

According to Freddie Mac, average conventional 30-year mortgage rates rose sharply in the fourth quarter to 3.84 percent, up from 3.45 percent in the prior quarter, as the Federal Reserve raised the federal funds target rate range for the second time in the last ten years; average rates for the month of December were 4.2 percent. For the whole year, the average rate was 3.65 percent, which were still among historical lows.

Non-Agency Issuance

Non-agency issuance totaled \$47.6 billion in 4Q'16, an increase of 4.0 percent from 3Q'16 (\$45.8 billion) and an increase of 10.2 percent y-o-y (\$43.2 billion). Non-agency residential mortgage-backed securities (RMBS) issuance was \$21.6 billion (down 18.8 percent q-o-q and up 0.5 percent y-o-y), while commercial mortgage backed securities (CMBS) issuance was \$26.0 billion (up 31.1 percent q-o-q and 19.9 percent y-o-y). For the full year, non-agency issuance was \$160.7 billion, down 19.2 percent from 2015 volumes. Non-agency CMBS volume fell to a greater extent (24.7 percent) than non-agency RMBS volumes (13.5 percent). Several real estate investment trusts (REIT) exited the market entirely or slowed production in 2016 due to unfavorable pricing conditions, resulting in declines in both non-agency RMBS and CMBS volumes.

Trading Activity

Daily trading volumes for mortgage-related securities rose slightly in the fourth quarter, with increases in agency trading while non-agency trading volumes declined. Average daily trading volume of agency mortgage-related securities, including passthroughs, CMOs and TBAs, was \$216.7 billion in 4Q'16, an increase of 3.1 percent from 3Q'16 and 26.9 percent y-o-y. Average daily trading volumes of non-agency securities fell to \$2.5 billion daily in 4Q'16, a decline of 9.3 percent q-o-q but was an increase of 4.1 percent y-o-y. For the full year, average daily trading volumes were \$210.7 billion daily, an increase of 8.8 percent from the prior year, entirely due to the pickup in agency trading volumes.

ASSET-BACKED SECURITIES

Asset-Backed Market Issuance

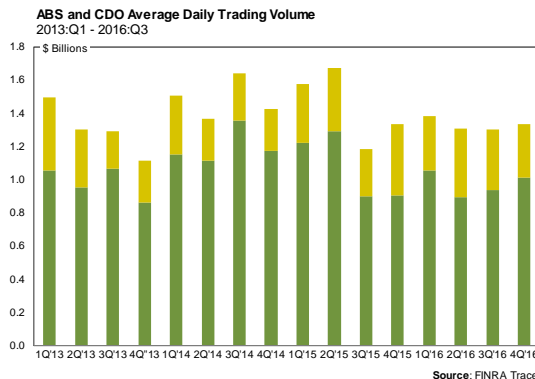
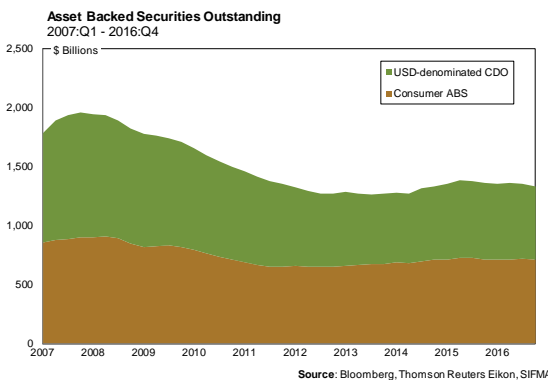
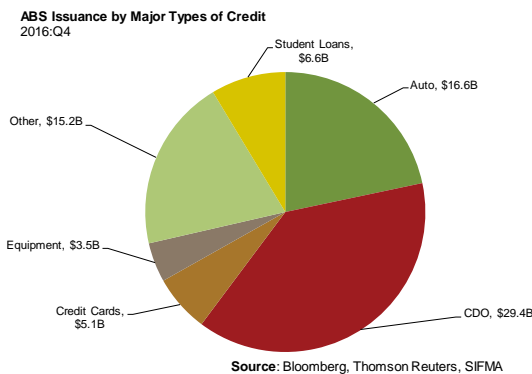
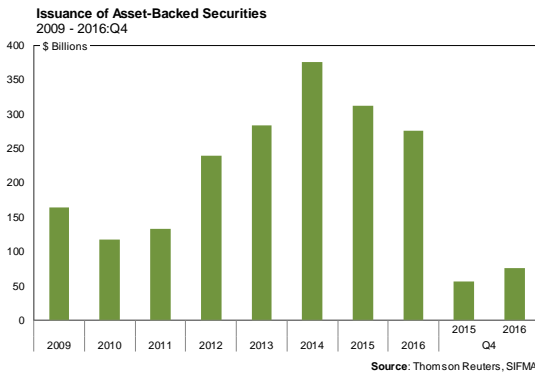
Asset-backed securities (ABS) issuance totaled \$76.4 billion in the fourth quarter, an increase of 1.2 percent q-o-q and 36.3 percent y-o-y. Both the auto and CDO sectors led issuance totals with \$16.6 billion (21.7 percent of 4Q'16 total issuance) and \$29.4 billion (38.5 percent of fourth quarter issuance) issued, respectively, although all asset categories had increased issuance in the final quarter of the year. For the full year, ABS issuance was \$275.4 billion, a decline of 11.7 percent from the prior year.

On a q-o-q basis, all asset categories experienced increases in issuance volumes in the fourth quarter, with auto, USD-denominated CDO, credit cards, equipment, esoteric ABS and student loans increasing 21.7 percent, 38.5 percent, 6.6 percent, 4.6 percent, 20.0 percent, and 8.6 percent, respectively. For the full year, only credit cards and student loans experienced increases in issuance volumes, increasing by 8.6 percent and 15.5 percent respectively. Auto, USD-denominated CDO, equipment and esoteric ABS all declined by 4.8 percent, 23.7 percent, 15.4 percent, and 17.1 percent, respectively as stellar final quarter volumes failed to eclipse the lackluster first quarter of 2016.

Outstanding volumes ended third quarter at \$1.33 trillion, a decline of 1.8 percent q-o-q and a decline of 2.2 percent y-o-y. Auto cards, equipment, and esoteric ABS grew in the fourth quarter, growing by 0.4 percent, 0.2 percent and 0.5 percent respectively, while credit cards, student loans, and USD-denominated CDO declined by 2.6 percent, 1.1 percent, and 3.2 percent, respectively. Notable subcategories to see q-o-q growth were: auto floorplan lease (4.5 percent growth), transportation equipment (6.0 percent), cell tower leases (9.2 percent), and PACE securitizations (28.4 percent). Year-over-year, the categories that saw the most growth were auto fleet lease (26.8 percent), unsecured personal/consumer loans (29.7 percent), and PACE securitizations (312.0 percent).

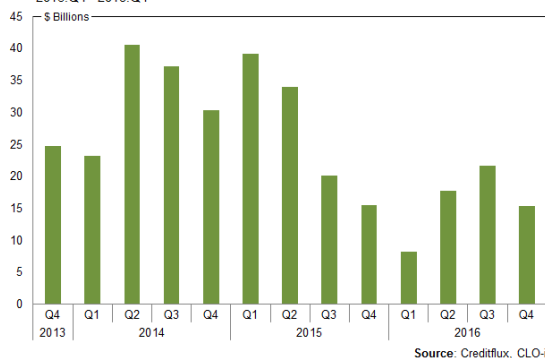
Trading Activity

Daily average trading activity in ABS and CDOs grew in the fourth quarter to \$1.34 billion, an increase of 2.8 percent from \$1.30 billion in 3Q'16 and a 0.3 percent increase from \$1.33 billion in 4Q'15. Trading activity increases were driven largely by ABS trading volumes, which averaged \$1.01 billion daily in 4Q'16, an increase of 8.2 percent and 11.9 percent, respectively, q-o-q and y-o-y. CDO trading volumes were \$0.32 billion, a decline of 11.2 percent and 24.2 percent, respectively, q-o-q and y-o-y.

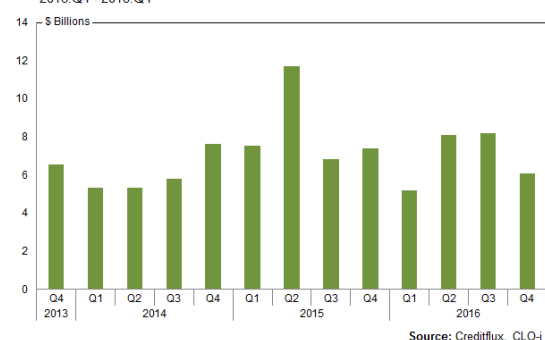


U.S. COLLATERALIZED LOAN OBLIGATIONS⁴

Primary U.S. CLO Issuance Volumes
2013:Q4 - 2016:Q4



Secondary U.S. CLO Trading Volumes
2013:Q4 - 2016:Q4



Overview

The fourth quarter of the year is traditionally a quiet one for the CLOs, as market participants slow down to enjoy the Thanksgiving and Christmas holidays. This was far from the case in 4Q of 2016, as the risk retention deadline loomed large on the horizon. The rule, which requires managers to retain a 5 percent net economic interest in their CLOs, took effect on 24 December.

CLO primary market

With the commodities crisis and extreme credit volatility of the first quarter now a distant memory, the CLO market turned its attention towards addressing risk retention.

In our previous quarterly update, we discussed the sharp rise in CLO refinancings and resets in the final weeks of the third quarter, with 44.8 percent of new issuance in the month of September coming from these deals. Resets – a subset of CLO refinancings which push out the reinvestment period and legal maturity of a deal – allowed managers and investors to extend the duration of their existing deals, while buying additional time to address risk retention.

According to Creditflux data, the CLO refinancing trend became even more pronounced in the final three months of the year. Between October and December, refinancings and resets accounted for 56.1 percent of primary market volumes.

While risk retention was a major motivating factor behind the refinancing trend in the US CLO market, it was not the only one. As market participants became more certain of a December interest rate rise by the Federal Reserve, demand for leveraged loans and CLOs increased as investors sought the relative safety of

floating-rate securities. As a result, CLOs were able to take advantage of the increase in demand and reprice their liabilities at a tighter level.

With that being said, there were plenty of “true new issue” CLOs in Q4. Creditflux data shows that 48 new US CLOs priced in Q4, for a total of \$23.7 billion – a 13.4 percent increase on the same period in 2015, when \$20.9 billion priced across 40 deals. The new issue market was supported by another major triple-A investor, as Japan Post made its long-awaited entry into CLO investing. The market also welcomed one new debut CLO issuer – Alliance Bernstein Private Credit, which priced its debut mid-market CLO on December 9.

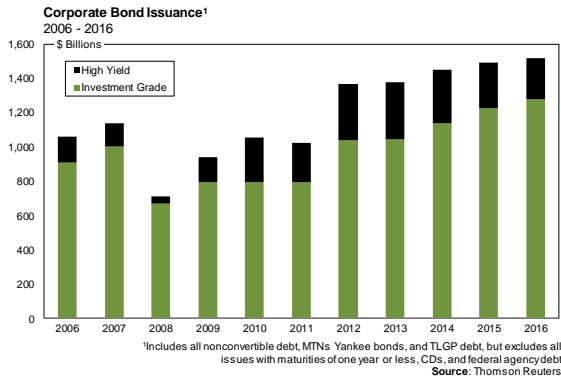
CLO secondary market

Secondary CLO trading volumes fell in the fourth quarter, with just \$6.06 billion appearing on b-wics between October and December. This marks a 40 percent fall from the third quarter, and a fall of 18.1 percent from the same period in 2015. Trader sources indicate that the scramble to get new issue deals done before the risk retention deadline on 24 December caused a “softening” in primary CLO spreads, making new issue deals more attractive on a relative value basis.

While trading volumes were markedly decreased, it is worth noting that demand was still high for those CLOs that found their way onto b-wics in Q4. CLO-I data shows that prices for triple-A, triple-B and double-B CLO tranches all increased over the course of Q4, with CLO-I's triple-A CLO index finishing the year above par, at 100.1 cents. Our double-B CLO index, which fell to 60.93 cents at the end of February, finished the year at 94.14 cents, reflecting a remarkable recovery.

⁴ The author of the CLO section is James Harvey, Creditflux. For any questions, please contact James Harvey at james.harvey@creditflux.com.

CORPORATE BOND MARKET



Corporate Bond Issuance

Corporate bond issuance totaled \$257.5 billion in 4Q'16, down 39.1 percent from \$422.7 billion issued in 3Q'16 and 12.7 percent from 4Q'15's issuance of \$294.9 billion. Over half of the bonds issued in the fourth quarter were for general corporate purposes (57.8 percent of total issuance), followed by indebtedness reduction (15.2 percent), and future acquisitions (8.2 percent). For the full year 2016, corporate bond issuance increased to \$1.52 trillion, up 1.8 percent from \$1.49 billion in 2015.

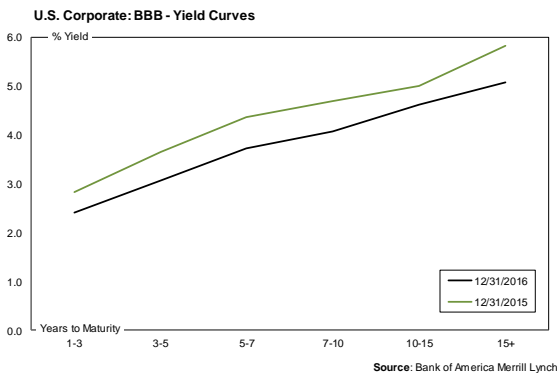
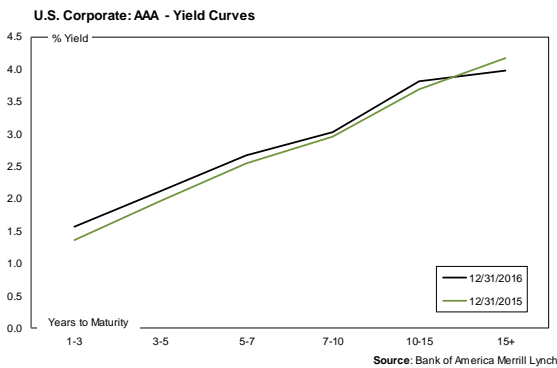
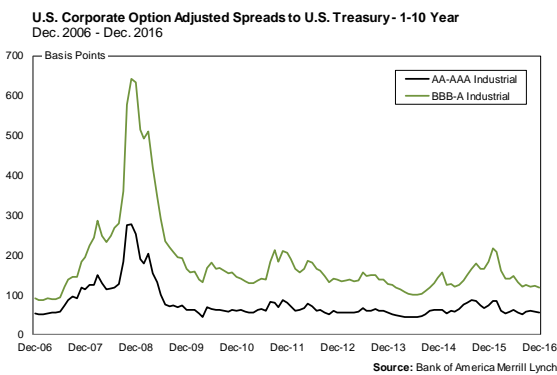
IG bond issuance was \$208.8 billion in 4Q'16, down 41.2 percent from \$354.9 billion in the previous quarter and down 19.5 percent y-o-y. The top three industries accounted for approximately 70 percent of 4Q'16 IG issuance: financial companies remained the leading IG debt issuance sector accounting for over a third (\$87.3 billion) of all IG issuance, followed by the energy and power sector with 16.1 percent (\$33.6 billion) and the healthcare sector with 12.1 percent (\$25.3 billion). For the full year 2016, IG bond issuance totaled \$1.28 trillion, up 4.1 percent from \$1.23 trillion in 2015.

Issuance of HY bonds decreased to \$48.7 billion in 4Q'16, 28.1 percent below the 3Q'16's total of \$67.8 billion but up 36.7 percent from \$35.6 billion issued in 4Q'15. Three sectors made up over half of total HY issuance in the fourth quarter: energy and power (32.6 percent, \$15.9 billion), media and entertainment (11.6 percent, \$5.7 billion), and financials (10.8 percent, \$5.2 billion). For the full year 2016, HY issuance decreased to \$237.3 billion, down 9.3 percent from \$261.7 billion in 2015.

Bond Spreads and U.S. Default Rate

According to Bank of America-Merrill Lynch, option adjusted spreads for both AA-AAA industrial bonds and BBB-A industrial bonds tightened in the fourth quarter of 2016. Spreads of IG bond finished the quarter at 54 bps, down 3 bps from 57 bps at end-September 2016 and down 17 bps from 71 bps at the end of 2015. HY bond spreads tightened even more q-o-q, ending 4Q'16 at 116 bps, 7 bps below 123 bps in 3Q'16 and down 67 bps from 183 bps at the end of 2015.

S&P's Global Fixed Income Research reported the number of U.S. defaulted issuers decreased to 19 issuers in the fourth quarter from 25 in 3Q'16 but up from 18 in 4Q'15. For the full year 2016, U.S. defaults reached 106, up 60.6 percent from 66 defaults in 2015. The U.S. trailing 12-month speculative-grade corporate default rate increased to 5.1 percent in December 2016, up from 5.0 percent in September 2016 and is expected to stay at 5.1 percent through September 2017.⁵



⁵ Standard & Poor's Rating Services, [The U.S. Speculative-Grade Corporate Default Rate](#), February 1, 2017.

S&P US Corporate Rating Actions

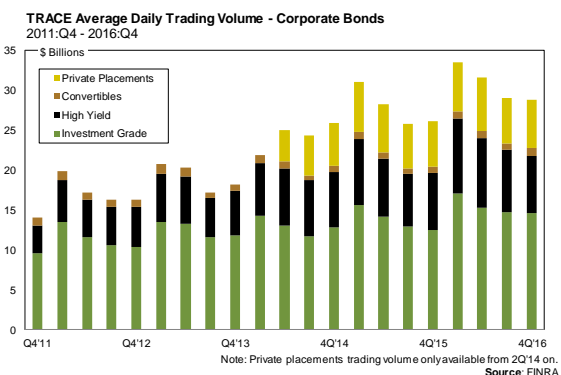
	2016:Q4	2016:Q3	2015:Q4	Q-o-Q	Y-o-Y
Upgrades	55	54	38	1.9%	44.7%
Downgrades	118	104	161	13.5%	-26.7%

Source: S&P Fixed Income Research

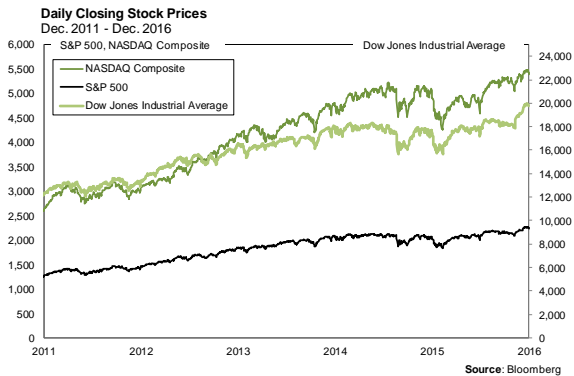
In 4Q'16, S&P Ratings Services downgraded 104 and upgraded 54 U.S. issuers, a ratio of downgrades to upgrades of 1.9. This was a decrease from the previous quarter when there were 118 downgrades versus 55 upgrades with a ratio of 2.1. For the full year 2016, downgrades outpaced upgrades 593 to 225, a higher downgrade to upgrade ratio than 457 downgrades to 210 upgrades in 2015.

Trading Activity

According to the FINRA TRACE data, average daily trading volumes decreased for investment grade (IG) and high yield (HY) corporate bonds but increased for convertible bonds (CV) and private placements in 4Q'16. IG bonds average daily trading volume decreased to \$14.7 billion in 4Q'16, down 0.4 percent from \$14.7 billion q-o-q but up 17.1 percent from \$12.5 in 4Q'15. HY bonds average daily trading volume was \$7.2 billion in 4Q'16, an 8.9 percent decrease from \$7.9 billion in the previous quarter but a 0.3 percent increase from \$7.1 billion in 4Q'15. The average daily trading volume of CV bonds increased to \$1.02 billion in 4Q'16, a 25.4 percent above 3Q'16's \$0.81 billion and 33.8 percent above \$0.76 billion in 4Q'15. Private placements trading volume increased by 6.9 percent to \$6.0 billion in 4Q'16 and was up 4.2 percent from \$5.8 billion in 4Q'15.



EQUITY AND OTHER MARKETS



The U.S. equity market posted gains in the fourth quarter of 2016. The S&P 500 closed the year at 2,238.83, a 3.3 percent increase from the prior quarter and 9.5 percent increase y-o-y. The NASDAQ Composite Index finished 2016 at 5,383.12, a 1.3 percent increase q-o-q and a 7.5 percent increase y-o-y. The Dow Jones Industrial Average (DJIA) recorded also posted an increase ending 2016 at 19,762.60, a 7.9 percent gain q-o-q and a 13.4 percent gain y-o-y.

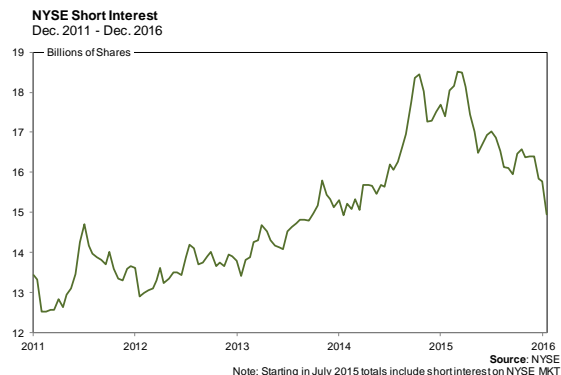
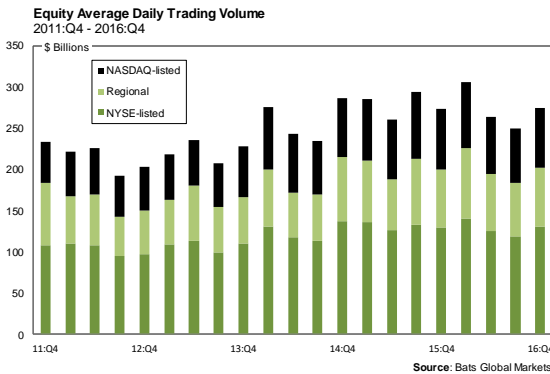
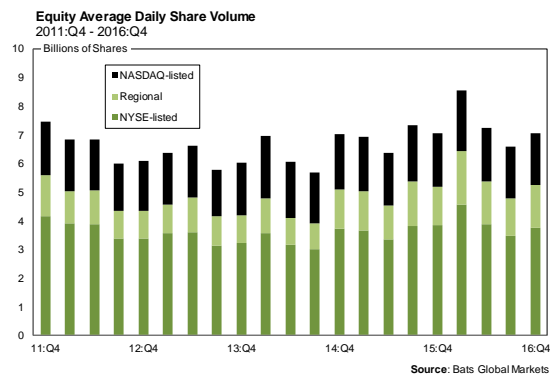
Equity Average Daily Share and Dollar Volume

Equity average daily share volume increased by 8.4 percent to 7.1 billion shares in 4Q'16 from 6.6 billion shares in 3Q'16 and unchanged from 7.1 billion in 4Q'15. The largest quarterly increase was observed in stocks listed on regional exchanges, whose average daily share volume jumped by 11.4 percent in 4Q'16 while NYSE-listed stock volume increased by 8.4 percent and NASDAQ-listed stock volume increased by 1.8 percent.

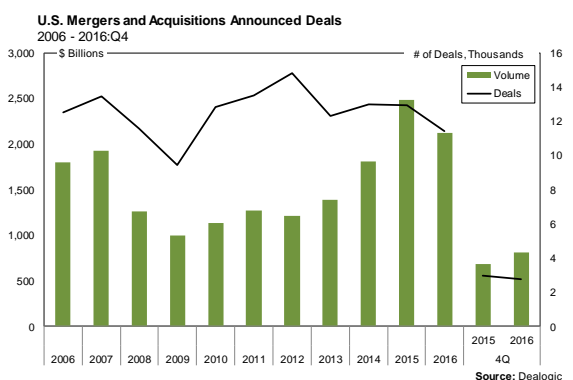
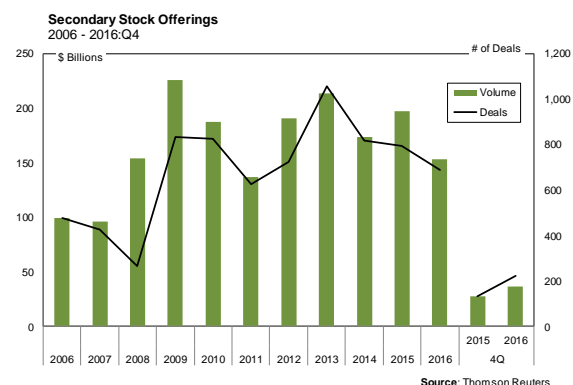
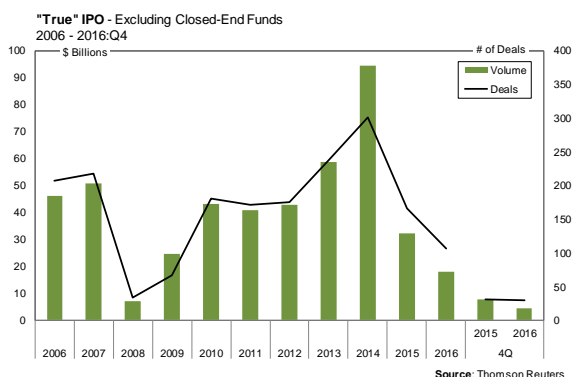
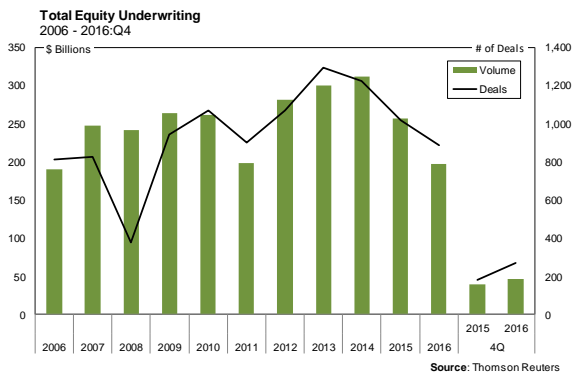
Equity average daily dollar volume increased by 9.9 percent to \$274.3 billion in 4Q'16 from \$249.6 billion in 3Q'16 and up 0.4 percent from \$273.1 billion in 4Q'15. Unlike the share trade volume, increases in dollar volume were uniform between regional exchanges, NYSE, and NASDAQ, all recording roughly a 10.0 percent increase q-o-q.

NYSE Short Interest

The number of shares sold short on the NYSE averaged 16.0 billion in 4Q'16, down 2.1 percent from 16.3 billion during the previous quarter and down 9.0 percent from 17.5 billion in 4Q'15. NYSE short interest was 6.0 percent above the five-year average of 15.0 billion. Out of approximately 6,100 issues, a short position was shown in 4,976 issues, of which 3,998 issues showed a short position of 5,000 shares or more.⁶ For the full year 2016, NYSE short interest averaged 16.8 billion shares, an increase of 1.7 percent from 16.5 billion in 2015.



⁶ NYSE, NYSE Arca and NYSE MKT Short Interest Reports, January 11, 2017.



Equity Underwriting Volume

Equity underwriting decreased by 15.2 percent to \$46.4 billion in the fourth quarter from \$54.7 billion in 3Q'16 but increased by 16.5 percent from \$39.8 billion issued in 4Q'15. Equity underwriting volume in 4Q'16 was 31.1 percent below the five-year average of \$67.4 billion. For the full year 2016, equity underwriting totaled \$197.0 billion, 23.3 percent below the \$256.8 billion in 2015.

IPO Volume

"True" initial public offerings (IPOs), which exclude closed-end mutual funds, decreased to \$4.4 billion on 29 deals in 4Q'16. IPO volume decreased by 28.8 percent from \$6.2 billion on 35 deals in 3Q'16 and by 42.9 percent from \$7.7 billion on 31 deals in 4Q'15. For the full year 2016, the IPO volume decreased to \$17.8 billion, down 44.8 percent from \$32.3 billion and was the lowest annual IPO volume since \$7.2 billion in 2018.

Secondary Offerings

Secondary market issuance decreased to \$36.8 billion on 223 deals in 4Q'16, down 11.6 percent from \$41.6 billion on 163 deals in 3Q'16 but up 34.3 percent from \$27.4 billion on 133 deals in 4Q'15. For the full year 2016, \$153.4 billion was issued through secondary offerings, a decrease of 22.1 percent from \$196.9 billion in 2015.

Announced M&A Volume

Announced U.S. mergers and acquisitions (M&A) volume stood at \$813.7 billion in 4Q'16, an 81.2 percent increase from the previous quarter's \$449.0 billion and an 18.2 percent increase y-o-y. M&A volume was 80.3 percent above the 5-year quarterly average of \$451.2 billion. For the full year 2016, the announced M&A volume totaled \$2.12 trillion, a decrease of 14.7 percent from \$2.49 trillion in 2015.

According to data from Dealogic, the amount of "U.S. Inbound" M&A (money invested in U.S. companies by those outside the U.S. through M&A) increased to \$162.5 billion in 4Q'16, up 33.4 percent from \$121.8 billion in the previous quarter and up 78.3 percent from \$91.1 billion in 4Q'15. The dollar amount U.S. companies invested in other countries through M&A ("US Outbound") also increased in 4Q'16; American firms invested \$146.6 billion in deals outside of the U.S., a 251.5 percent increase from \$41.7 billion in 3Q'16 and up 137.0 percent from \$61.9 billion invested in 4Q'15.

S&P P/E Ratio

The S&P 500's P/E ratio averaged 20.4 in 4Q'16, up 0.7 percent from the previous quarter's 20.3 and up 11.4 percent from 18.3 in 4Q'15. The S&P P/E ratio stood 19.1 percent above the 5-year average of 17.2 in 3Q'16 but 28.4 percent below the high of 28.4 in 1Q'00.⁷ For the full year 2016, the S&P 500's P/E ratio averaged 19.4, a 6.3 percent increase from 18.3 in 2015.

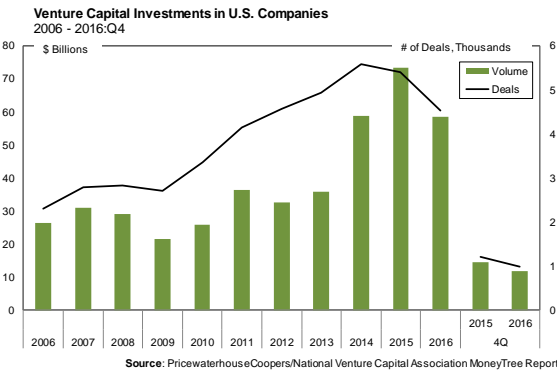
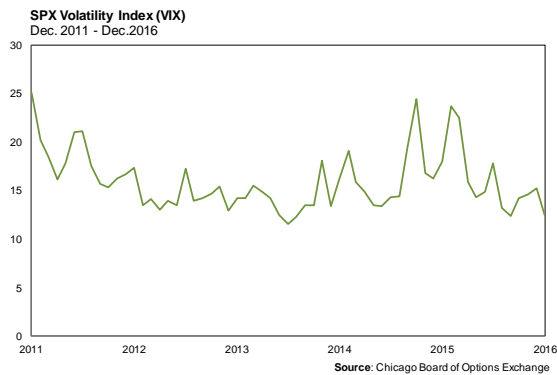
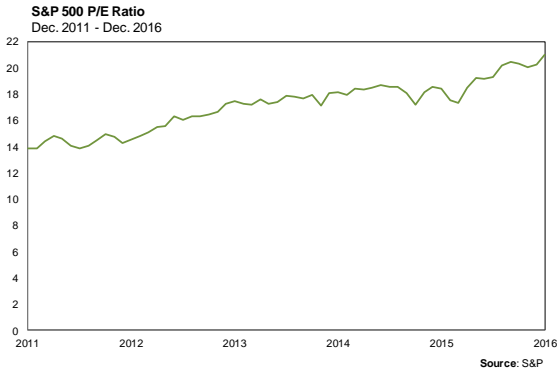
CBOE VIX Index

The Chicago Board Options Exchange Volatility Index (VIX) increased to an average of 14.1 in the fourth quarter from an average of 13.2 in 3Q'16 but decreased from 17.0 in 4Q'15. The index started off decreasing to a low of 11.24 in the beginning of November but then gradually increased to a high of 22.51 at the end of December. The spread between high and low values for the VIX was 11.24 in 4Q'16, wider than 6.80 in 3Q'16 and then 10.24 in 4Q'15.

Venture Capital Volume

Venture capitalists invested \$11.7 billion in 982 deals in the fourth quarter of 2016, according to the MoneyTree™ Report from PricewaterhouseCoopers LLP (PwC) and the National Venture Capital Association (NVCA), based on data provided by Thomson Reuters. Quarterly venture capital (VC) investment activity decreased by 16.8 percent in dollar terms and by 13.9 percent in the number of deals compared to 3Q'16 when \$14.0 billion was invested in 1,141 deals. In addition to the decrease, the third quarter of 2016 was the first quarter since 4Q'11 with less than 1,000 deals. The internet sector continued to receive the highest level of funding of all industries with \$4.6 billion in 4Q'16, down 26.3 percent from \$6.2 billion in 3Q'16. The mobile and telecommunications sector received second largest amount of funding with \$2.5 billion followed by the healthcare sector with \$1.9 billion.⁸

For the full year 2016, venture capitalists invested \$58.6 billion in 4,520 deals, a decrease of 20.1 percent from \$73.4 billion in 5,409 deals in 2015. The internet sector received the highest level of funding of all industries with \$22.0 billion in 2016, followed by mobile and telecommunications sector with \$11.4 billion followed by healthcare sector with \$11.0 billion.

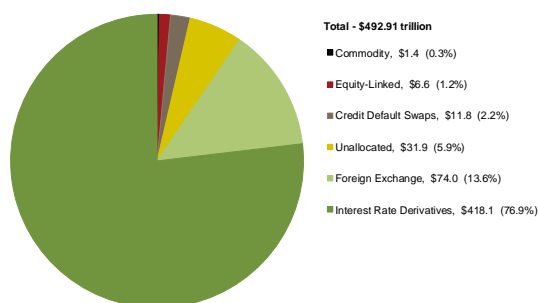


⁷ SIFMA records start in January 2000.

⁸ [US MoneyTree Report Press Release](#), 4Q 2016.

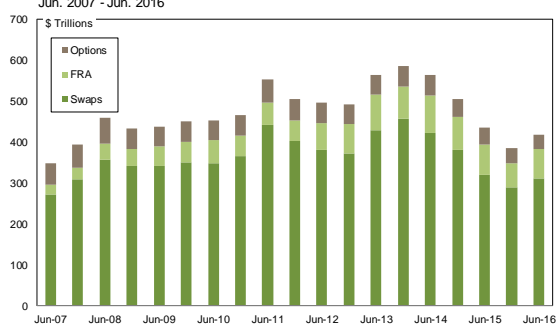
GLOBAL OTC DERIVATIVES⁹

Gross Notional Amounts Outstanding: Global OTC Derivatives
Jun. 2016



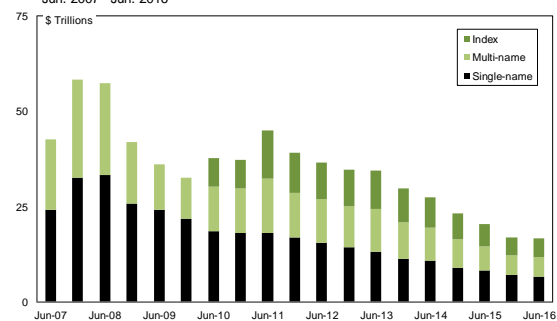
Source: Bank for International Settlements

Gross Notional Amounts Outstanding: Interest Rate Derivatives
Jun. 2007 - Jun. 2016



Source: Bank for International Settlements

Gross Notional Amounts Outstanding: Credit Default Swaps
Jun. 2007 - Jun. 2016



Source: Bank for International Settlements

Global OTC Derivatives Market

According to the most recent Bank of International Settlements (BIS) Semi-annual Over-the-Counter (OTC) Derivatives Markets Statistics Report (“BIS Report”)¹⁰, the gross notional amount outstanding of OTC derivatives totaled \$544.1 trillion as of end-June 2016, up 10.4 percent from end-December 2015 (most recent data available). While equities (down 7.1 percent to \$6.6 trillion) and credit default swaps (CDS) (down 4.2 percent to \$11.8 trillion) saw decreases, these were outweighed by increases in interest rate derivatives (IRD) (up 8.9 percent to \$418.1 trillion), foreign exchange contracts (up 5.1 percent to \$74.0 trillion), unallocated contracts (up 83.0 percent to \$31.9 trillion), and commodity swaps (up 5.5 percent to \$1.4 trillion) from end-December 2015.

The gross market value of OTC derivatives increased to \$20.7 trillion as of end-June 2016, up 42.9 percent from end-December 2015, which according to the BIS statistical release¹¹ can largely attributed to increases in foreign exchange derivatives involving the yen and pound sterling, due to sharp moves in the respective currencies. Gross credit exposure of outstanding OTC derivatives increased 29.0 percent to \$3.7 trillion during the same period.

Interest Rate Derivatives

According to the BIS Report, IRD accounted for the majority of the gross notional amount outstanding for the OTC derivatives market, at \$418.1 trillion as of end-June 2016, representing 76.8 percent of the global market (a 1.4 percent decrease from the end-December 2015 market share of 77.9 percent). Interest rate swaps (IRS) (accounting for 74.5 percent of the total IRD market as of end-June 2016) totaled \$311.5 trillion, up 7.9 percent from end-December 2015 (down 2.6 percent, however, y-o-y). Forward Rate Agreements (FRAs) also saw increases (up 23.2 percent from end-December 2015, but down 5.0 percent y-o-y). Options, however, declined 6.3 percent from end-December 2015 and 13.3 percent y-o-y.

Credit Default Swaps

According to the BIS Report, CDS accounted for 2.3 percent of the gross notional amount outstanding of the global OTC derivatives market, at \$11.8 trillion as of end-June 2016 (down 4.2 percent from end-December 2015 and 19.3 percent y-o-y). Single-name CDS totaled \$6.6 trillion as of end-June 2016 (down 7.8 percent from end-December 2015 and 19.3 percent y-o-y). Multi-name CDS totaled \$5.2 trillion as of end-June 2016 (unchanged from end-December 2015 and down 19.3 percent y-o-y). Index CDS totaled \$4.8 trillion as of end-June 2016 (up 2.1 percent from end-December 2015, but down 18.2 percent y-o-y).

⁹ Updated semiannually based on data from Bank for International Settlements.

¹⁰ Based on data from most recent report released, available at: <http://www.bis.org/statistics/derstats.htm>.

¹¹ Available at: http://www.bis.org/publ/otc_hy1611.pdf.

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