4.1.1 Federal Debt Held by the Public

As Of: Aug-2019

Percent of GDP

Note: Data for fiscal years.
Years after 2018 are projected.

Source: CBO, Haver Analytics
Note: Spread equals the difference between the yield on the 10-year U.S. Treasury and 2-year U.S. Treasury.
4.1.3 10-Year Treasury Yields

Source: U.S. Department of the Treasury

Note: Break-even represents the difference between the nominal and TIPS yield.
4.1.4 Fixed Income Implied Volatility

Basis Points

As Of: 30-Sep-2019

Note: Implied volatility is calculated using a yield curve-weighted index of the normalized implied volatility on 1-month Treasury options.

Source: Bloomberg, L.P.
4.2.1 Advanced Economies Real GDP Growth

As Of: 2019 Q2

Source: Eurostat, CAO, BEA, Haver Analytics

Note: Data represents seasonally adjusted quarter-over-quarter annualized real GDP growth rates.
Note: Represents the spread between the 10-year and 3-month yield for select sovereign markets.
4.2.3 Outstanding Negative Yielding Debt

As Of: 30-Sep-2019

- Government Related
- Corporates
- Sovereigns
- Securitized

Percent of Global Sovereigns with Negative Yield (ex. U.S.)

Note: Market value of the Bloomberg Barclays Global Aggregate Negative Yielding Debt Index. Sovereigns include securities classified as Treasuries.
### 4.2.4 Sovereign Negative Yielding Debt

**As Of: 30-Sep-2019**

<table>
<thead>
<tr>
<th>Country</th>
<th>S&amp;P Rating</th>
<th>Negative Thru</th>
<th>Value ($B)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Euro Area</strong></td>
<td></td>
<td></td>
<td>4,932</td>
</tr>
<tr>
<td>France</td>
<td>AA</td>
<td>15 Yrs.</td>
<td>1,454</td>
</tr>
<tr>
<td>Germany</td>
<td>AAA</td>
<td>31 Yrs.</td>
<td>1,202</td>
</tr>
<tr>
<td>Spain</td>
<td>A</td>
<td>8 Yrs.</td>
<td>589</td>
</tr>
<tr>
<td>Italy</td>
<td>BBB</td>
<td>3 Yrs.</td>
<td>470</td>
</tr>
<tr>
<td>Netherlands</td>
<td>AAA</td>
<td>27 Yrs.</td>
<td>353</td>
</tr>
<tr>
<td>Belgium</td>
<td>AA-</td>
<td>15 Yrs.</td>
<td>302</td>
</tr>
<tr>
<td>Austria</td>
<td>AA+</td>
<td>17 Yrs.</td>
<td>216</td>
</tr>
<tr>
<td>Finland</td>
<td>AA+</td>
<td>15 Yrs.</td>
<td>93</td>
</tr>
<tr>
<td>Ireland</td>
<td>A+</td>
<td>10 Yrs.</td>
<td>90</td>
</tr>
<tr>
<td>Portugal</td>
<td>BBB</td>
<td>7 Yrs.</td>
<td>89</td>
</tr>
<tr>
<td>Slovakia</td>
<td>A+</td>
<td>11 Yrs.</td>
<td>33</td>
</tr>
<tr>
<td>Slovenia</td>
<td>AA-</td>
<td>9 Yrs.</td>
<td>20</td>
</tr>
<tr>
<td>Luxembourg</td>
<td>AAA</td>
<td>8 Yrs.</td>
<td>7</td>
</tr>
<tr>
<td><strong>Euro Area (Cont.)</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Latvia</td>
<td>A</td>
<td>9 Yrs.</td>
<td>5</td>
</tr>
<tr>
<td>Lithuania</td>
<td>A</td>
<td>10 Yrs.</td>
<td>5</td>
</tr>
<tr>
<td>Cyprus</td>
<td>BBB-</td>
<td>5 Yrs.</td>
<td>4</td>
</tr>
<tr>
<td>Malta</td>
<td>A-</td>
<td>2 Yrs.</td>
<td>1</td>
</tr>
<tr>
<td><strong>Japan</strong></td>
<td>A+</td>
<td>14 Yrs.</td>
<td>5,931</td>
</tr>
<tr>
<td><strong>Other Europe</strong></td>
<td></td>
<td></td>
<td>249</td>
</tr>
<tr>
<td>Denmark</td>
<td>AAA</td>
<td>20 Yrs.</td>
<td>105</td>
</tr>
<tr>
<td>Switzerland</td>
<td>AAA</td>
<td>45 Yrs.</td>
<td>83</td>
</tr>
<tr>
<td>Sweden</td>
<td>AAA</td>
<td>13 Yrs.</td>
<td>59</td>
</tr>
<tr>
<td>Hungary</td>
<td>BBB</td>
<td>2 Yrs.</td>
<td>2</td>
</tr>
</tbody>
</table>

**Source:** Bloomberg, L.P.

**Note:** Includes securities classified as Treasuries in the Bloomberg Barclays Global Aggregate Negative Yielding Debt Index.
4.2.5 Euro Area Business and Consumer Surveys

Source: European Commission, Haver Analytics

Note: Confidence surveys calculated as the difference between positive and negative responses. For economic sentiment index, 100 = long-term average.
4.2.6 Sectoral Contributions to German GDP Growth

As Of: 2019 Q2

Source: FSO, Haver Analytics, Staff Calculations

Note: Select sectoral contributions to year-over-year real GDP growth rates.
Note: A market-based measure of the expected inflation rate over a 5-year period starting in five years’ time.
4.2.8 Euro Area 10-Year Sovereign Yields

Source: Reuters, Haver Analytics

Note: Weekly averages.
4.2.9 Euro Area 10-Year Spreads

Source: Reuters, Haver Analytics

Note: Calculated as the weekly average spread between local 10Y and German 10Y.
**4.2.10 Euro Denominated Negative Yielding Debt**

As Of: 30-Sep-2019

<table>
<thead>
<tr>
<th>Month</th>
<th>Trillions of EUR</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nov-18</td>
<td></td>
</tr>
<tr>
<td>Jan-19</td>
<td></td>
</tr>
<tr>
<td>Mar-19</td>
<td></td>
</tr>
<tr>
<td>May-19</td>
<td></td>
</tr>
<tr>
<td>Jul-19</td>
<td></td>
</tr>
<tr>
<td>Sep-19</td>
<td></td>
</tr>
</tbody>
</table>

- **Other Debt**
- **BBB Sovereign**
- **A Sovereign**
- **AA Sovereign**
- **AAA Sovereign**

**Note:** AAA = Germany, Netherlands, Luxembourg; AA = France, Austria, Belgium, Slovenia; A = Ireland, Latvia, Lithuania, Malta, Slovakia, Spain; BBB = Italy, Portugal, Cyprus; other debt includes government-related, securitized, and corporate debt.

Source: Bloomberg, L.P.
4.2.11 EU Real GDP Per Capita

As Of: 2018

EU28
France
Spain
Germany
Italy

Source: Eurostat, Haver Analytics

Note: 2000 = 100. EU28 includes the 28 member states of the European Union.
4.2.12 Italy Fiscal Projections

Debt-to-GDP Projection: April 2018
Debt-to-GDP Projection: October 2019
Debt-to-GDP (left axis)

Structural Balance to Potential GDP Projection: April 2018
Structural Balance to Potential GDP Projection: October 2019
Structural Balance to Potential GDP (right axis)

As Of: 2018

Source: IMF WEO, Haver Analytics
4.2.13 Contributions to UK Real Gross Value Added

As Of: Sep-2019

Percent

Finance & Business Svs.
Construction
Production Industries
Total
Other
Trade, Transport, & Storage Svs.

Source: UK Office of National Statistics, Haver Analytics

Note: Contribution to year-over-year percent change in rolling 3 months real GVA.
4.2.14 Japanese Consumer Price Inflation

As Of: Sep-2019

Note: Data represents year-over-year percent change. CPI excludes fresh food and is adjusted for the consumption tax increase that took effect in April 2014.

Source: Bank of Japan, Haver Analytics
4.2.15 Japan 10-Year Government Bond Yield

As Of: 30-Sep-2019

Source: Bloomberg, L.P.
4.2.16 Gross Foreign Investor Capital Inflows to EMEs

Billions of US$  As Of: 2019 Q2  Billions of US$

Portfolio Inflows  Foreign Direct Investment  Net Flows  Bank Inflows

Source: IMF, Haver Analytics
4.2.17 Emerging Market Gross Global Bond Issuance

Note: Bonds have maturities greater than one year and have been internationally marketed or placed. “Public” includes issuance by municipal and state-owned enterprises.

Source: Dealogic
4.2.18 EME Nonfinancial Corporates Maturity Structure

As Of: 30-Sep-2019

Maturing Within 3 Years
Maturing Within 1 Year

Advanced Economy Average (<= 3 Years)

Source: Bloomberg, L.P, Staff Calculations

Note: Represents percent of private nonfinancial corporate debt maturing within 3 years.
4.2.19 Emerging Market Bond Spreads

As Of: 30-Sep-2019

Source: JP Morgan, Haver Analytics

Note: JP Morgan EMBI+ Sovereign Spreads indices for each region.
4.2.20 Emerging Market Sovereign CDS Spreads

As Of: 30-Sep-2019

Argentina (right axis)
Turkey (left axis)
Brazil (left axis)
Markit CDX EM Index (left axis)

Note: 5-year USD spreads.
4.2.21 Chinese Real GDP Growth and its Components

Source: China National Bureau of Statistics, Haver Analytics

Note: Year-over-year percentage change.
4.2.22 Chinese Credit Growth

Total Social Financing (Old Definition + Local Gov’t Bond Issuance)

Total Social Financing (New Definition)

Total Social Financing (Old Definition)

Note: Calculated as the year-over-year percent change total social financing (TSF) flows since 2002. TSF refers to the total volume of financing provided by the financial system to the real economy. TSF (old definition) excludes loan write-offs, ABS of depository institutions, and local gov’t special bonds.

Source: PBOC, CCDC, Haver Analytics, Staff Calculations
Note: Total passenger car sales over the preceding 12 months. Percent change shows the number of passenger cars sold in a given month compared to the same month one year ago.
4.2.24 Credit to the Chinese Nonfinancial Private Sector

As Of: 2019 Q1

Source: China National Bureau of Statistics, BIS, Haver Analytics

Note: Rolling 4-quarter sum of GDP.
4.2.25 China Negotiable Certificate of Deposit Credit Spread

Basis Points

As Of: 30-Sep-2019

Source: Bloomberg, L.P.

Note: Spread between AAA and AA+ 6-month negotiable certificate of deposit.
4.2.26 Change in State and Local Government Tax Revenues

Source: Census Bureau

Note: Data represents year-over-year change. Revenue measures includes revenues from property, individual income, corporate income, and sales taxes. Gray bars signify NBER recessions.
4.2.27 Municipal Bond Mutual Fund Flows

Billions of US$  As Of: Sep-2019  Billions of US$

Source: ICI, Haver Analytics
4.2.28 Municipal Bonds to U.S. Treasuries

Source: Municipal Market Analytics, Bloomberg, L.P.

Note: Calculated as the ratio between municipal general obligation bonds and U.S. Treasury securities of comparable maturities.
4.2.29 Municipal Bond Issuance

Billions of US$  As Of: Sep-2019  Billions of US$

<table>
<thead>
<tr>
<th>Year</th>
<th>Refunding</th>
<th>New Capital</th>
</tr>
</thead>
<tbody>
<tr>
<td>2003</td>
<td>300</td>
<td>200</td>
</tr>
<tr>
<td>2005</td>
<td>350</td>
<td>250</td>
</tr>
<tr>
<td>2007</td>
<td>400</td>
<td>300</td>
</tr>
<tr>
<td>2009</td>
<td>450</td>
<td>350</td>
</tr>
<tr>
<td>2011</td>
<td>500</td>
<td>450</td>
</tr>
<tr>
<td>2013</td>
<td>550</td>
<td>500</td>
</tr>
<tr>
<td>2015</td>
<td>600</td>
<td>550</td>
</tr>
<tr>
<td>2017</td>
<td>650</td>
<td>600</td>
</tr>
<tr>
<td>2019</td>
<td>700</td>
<td>650</td>
</tr>
</tbody>
</table>

Source: Thomson Reuters, SIFMA

Note: Excludes maturities of 13 months or less.
4.3.1 Nonfinancial Corporate Credit as Percent of GDP

Source: Federal Reserve, Haver Analytics

Note: Gray bars signify NBER recessions.
Note: Four-quarter moving average of the median ratio. Includes rated and unrated nonfinancial businesses. Gray bars signify NBER recessions. In 2019 FASB ASC 842 took effect. ASC 842 required companies to record operating leases on their balance sheets, resulting in higher reported debt levels.
4.3.3 U.S. Nonfinancial Business Interest Coverage Ratios

As Of: 2019 Q2

EBITDA / Interest Expense

Note: Four-quarter moving average of median ratio. Includes rated and unrated nonfinancial businesses. Gray bars signify NBER recessions.

Source: Compustat
4.3.4 Nonfinancial Corporations Liquid Assets

Percent of Total Assets | As Of: 2019 Q2 | Percent of Total Assets

Source: Federal Reserve, Haver Analytics

Note: Liquid assets includes foreign deposits, checkable deposits and currency, time and savings deposits, money market fund shares, security repurchase agreements, debt securities, and mutual fund shares. Gray bars signify NBER recessions.
4.3.5 Maturity Profile of Leveraged Debt

As Of: Sep-2019

Billions of US$

Institutional Loans
High-Yield Corporate Debt

Source: Bank of America/Merrill Lynch Global High-Yield Strategy and S&P Capital IQ LCD
4.3.6 Leveraged Loan Issuance

As Of: 30-Sep-2019

Billions of US$

Percent

Institutional (left axis)
Pro-rata (left axis)

Percent Covenant-Lite
(right axis)

Source: S&P LCD
Note: Percent covenant-lite limited to institutional loans.
4.3.7 Leveraged Loan Transactions with EBITDA Adjustments

Note: Media and telecom loans excluded prior to 2011. Excludes existing tranches of add-ons, amendments & restatements with no new money, as well as DIPs, second liens and unsecured transactions. EBITDA adjusted for prospective cost savings or synergies.

Source: S&P LCD
4.3.8 Distribution of Leveraged Loan Debt/EBITDA Ratios

As Of: 30-Sep-2019

Source: S&P LCD

Note: Includes issuers with EBITDA of more than $50M. Media and telecom loans excluded prior to 2011.
4.3.9 Bank Business Lending Standards and Demand

Change in C&I Loan Standards (left axis)
Change in Demand for C&I Loans (right axis)

Source: Federal Reserve Senior Loan Officer Opinion Survey

Note: Represents net percent of banks reporting tightening standards or stronger demand for medium and large C&I loans; four period moving average. Gray bars signify NBER recessions.
4.3.10 Non-Performing C&I Loans

Percent of C&I Loans  As Of: 2019 Q2  Percent of C&I Loans

Source: FRBNY, Haver Analytics

Note: Gray bars signify NBER recessions.
4.3.11 U.S. Corporate Credit Spreads

Basis Points

As Of: 30-Sep-2019

Basis Points


Leveraged Loans (right axis)
High-Yield (right axis)
Investment Grade (left axis)

Source: Bank of America Merrill Lynch, Federal Reserve, S&P LCD

Note: Secondary market spreads. Investment grade and high-yield data represent option-adjusted spreads. Dotted lines represent 1997-present median.
4.3.12 Gross Issuance of Corporate Bonds

As Of: Sep-2019

Source: Thomson Reuters, SIFMA

Note: Includes all non-convertible corporate debt, MTNs, and Yankee bonds, but excludes all issues with maturities of 1 year or less and CDs.
4.3.13 CLO Issuance

As Of: 30-Sep-2019

Billions of US$

Source: S&P LCD
A.1 CLO Investors as of Year-End 2018

Source: Federal Reserve, NAIC, TIC Data, Staff Calculations

Note: Other U.S. Investors includes holding companies, broker-dealers, private funds, nonfinancial companies, and households.
4.4.1 Household Debt as a Percent of Disposable Personal Income

Source: BEA, Federal Reserve, Haver Analytics

Note: Other Household Credit includes debts of both households and nonprofits.
4.4.2 Components of Consumer Credit

As Of: 2019 Q2

Billions of US$

Source: FRBNY Consumer Credit Panel/Equifax, Haver Analytics
4.4.3 Household Debt Service Ratio

As Of: 2019 Q2

Note: Ratio of debt-service payments to disposable personal income. Seasonally adjusted. Gray bars signify NBER recessions.

Source: Federal Reserve, Haver Analytics
4.4.4 Owners’ Equity as Share of Household Real Estate

As Of: 2019 Q2

Source: Federal Reserve, Haver Analytics
4.5.1 House Prices by Census Division

As Of: August-2019

Source: FHFA, Haver Analytics

Note: Purchase-only price index. Jan-1991 = 100.
4.5.2 Mortgage Originations and Rates

Billions of US$  

As Of: 2019 Q2

Refinance (left axis)
Purchase (left axis)

30-Year Mortgage Rate (right axis)

Source: Mortgage Bankers Association, Freddie Mac Primary Mortgage Market Survey

Note: Originations represent all 1-4 family homes. Originations calculated as 4-quarter moving averages. Mortgage rates calculated as quarterly averages.
4.5.3 Mortgage Delinquency and Foreclosure

As Of: 2019 Q2

Percent

As Of: 2019 Q2

Percent

Note: Percent of all mortgages.

Source: Mortgage Bankers Association, Haver Analytics

Note: Percent of all mortgages.
4.5.4 Mortgages with Negative Equity

Billions of US$  

As Of: 2019 Q2

Percent

Value of Negative Equity in Residential Mortgages (left axis)

Percent of Residential Mortgages with Negative Equity (right axis)

Source: CoreLogic
4.5.5 Purchase Origination Volume by Credit Score

Source: Black Knight’s McDash Dataset, FHFA calculations

Note: Includes first lien purchases only.
4.5.6 Average Stressed Default Rate for Home Purchase Loans


Note: The sample reported includes all first-lien purchase mortgages originated in a given year.
B.1 Mortgage Origination Market

As Of: 2019 Q3

Source: Inside Mortgage Finance

Note: Data covers top 25 originators in each year.
B.2 Mortgage Servicing Market

Trillions of US$

As Of: 2019 Q3

Source: Inside Mortgage Finance

Note: Data is as of fourth quarter each year except 2019, which is as of the third quarter. Data covers top 25 servicers in each quarter.
4.5.7 Mortgage Originations by Product

Source: Inside Mortgage Finance
4.5.8 RMBS Issuance

As Of: Sep-2019

Trillions of US$

Source: FHLMC, FNMA, GNMA, NCUA, FDIC, Bloomberg, L.P., Dealogic, Thomson Reuters, SIFMA
4.5.9 Commercial Property Price Growth

As Of: Jun-2019

Percent


Industrial
Retail
Office
Apartment
National

Source: Real Capital Analytics, Bloomberg, L.P.

Note: Year-over-year price change.
4.5.10 Multifamily Capitalization Rates and Spreads

Percent

As Of: Jun-2019

Percent

Source: Real Capital Analytics

Note: Dotted lines represent 2002-present avg.
4.5.11 CMBS Issuance

As Of: Sep-2019

Source: Inside Mortgage Finance
4.6.1 Real U.S. Dollar Trade-Weighted Index

Index

As Of: Sep-2019

Source: Federal Reserve, Haver Analytics

Note: Index shown as a share of its 1998-present average. Real USD Trade-Weighted Index is a weighted average of the FX value of the USD against the currencies of a broad group of major U.S. trading partners.
4.6.2 Nominal Value of the U.S. Dollar

As Of: Sep-2019

Index

GBP/USD
RMB/USD
EUR/USD
EME Dollar Index

Note: Jan 2008 = 100. Above 100 indicates dollar strengthening, while below 100 indicates dollar weakening. EME dollar index is a weighted average of the FX value of the USD against a subset of the broad index currencies that are EMEs.
4.6.3 Change in U.S. Dollar Exchange Rates

Percent

As Of: 30-Sep-2019

Percent

Argentina | Brazil | China | India | Indonesia | Korea | Mexico | Russia | South Africa | Turkey

Source: Wall Street Journal, Haver Analytics
4.7.1 S&P 500 Volatility

As Of: 30-Sep-2019

Source: Bloomberg, L.P.
## 4.7.2 Returns in Selected Equities Indices

### As Of: 30-Sep-2019

<table>
<thead>
<tr>
<th>Major Economies</th>
<th>6 Month Returns</th>
<th>1 Year Returns</th>
<th>5 Year Annualized Returns</th>
</tr>
</thead>
<tbody>
<tr>
<td>U.S. (S&amp;P 500)</td>
<td>5.0%</td>
<td>2.2%</td>
<td>8.6%</td>
</tr>
<tr>
<td>Euro (Euro Stoxx 50)</td>
<td>6.5%</td>
<td>5.0%</td>
<td>2.0%</td>
</tr>
<tr>
<td>Japan (Nikkei 225)</td>
<td>2.6%</td>
<td>(9.8%)</td>
<td>6.1%</td>
</tr>
<tr>
<td>U.K. (FTSE 100)</td>
<td>1.8%</td>
<td>(1.4%)</td>
<td>2.3%</td>
</tr>
</tbody>
</table>

### Selected Europe

| Germany (DAX)           | 7.8%            | 1.5%           | 5.6%                       |
| France (CAC 40)         | 6.1%            | 3.4%           | 5.2%                       |
| Italy (FTSE MIB)        | 3.9%            | 6.7%           | 1.1%                       |
| Spain (IBEX 35)         | 0.0%            | (1.5%)         | (3.1%)                     |

### Emerging Markets

<table>
<thead>
<tr>
<th>MSCI Emerging Market Index</th>
<th>(5.4%)</th>
<th>(4.5%)</th>
<th>(0.1%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Brazil (Bovespa)</td>
<td>9.8%</td>
<td>32.0%</td>
<td>14.1%</td>
</tr>
<tr>
<td>India (S&amp;P BSE Sensex)</td>
<td>(0.0%)</td>
<td>6.7%</td>
<td>7.7%</td>
</tr>
<tr>
<td>China (Shanghai SE Composite)</td>
<td>(6.0%)</td>
<td>3.0%</td>
<td>4.2%</td>
</tr>
<tr>
<td>Hong Kong (Hang Seng)</td>
<td>(10.2%)</td>
<td>(6.1%)</td>
<td>2.6%</td>
</tr>
<tr>
<td>Taiwan (TAIEX)</td>
<td>1.8%</td>
<td>(1.6%)</td>
<td>3.8%</td>
</tr>
<tr>
<td>South Korea (KOSPI)</td>
<td>(3.6%)</td>
<td>(12.0%)</td>
<td>0.4%</td>
</tr>
</tbody>
</table>

Source: Bloomberg, L.P.
### 4.7.3 U.S. Stock Valuations

**As Of: 2019 Q3**

<table>
<thead>
<tr>
<th>Metric</th>
<th>Current</th>
<th>Historical Percentile</th>
</tr>
</thead>
<tbody>
<tr>
<td>CAPE Ratio</td>
<td>29.3</td>
<td>95%</td>
</tr>
<tr>
<td>Buffett Indicator</td>
<td>146%</td>
<td>96%</td>
</tr>
<tr>
<td>Price-to-Book</td>
<td>3.4</td>
<td>83%</td>
</tr>
<tr>
<td>Trailing Price-to-Earnings</td>
<td>19.6</td>
<td>77%</td>
</tr>
<tr>
<td>Forward Price-to-Earnings</td>
<td>17.5</td>
<td>77%</td>
</tr>
</tbody>
</table>

Source: Bloomberg, L.P., Wilshire Associates, Haver Analytics, OFR

Note: Percentiles are based on historical data since, respectively, 1881, 1970, 1990, 1954, and 1990. CAPE, price-to-book, and price-to-earnings ratios are based on the S&P 500 aggregate index. Buffett Indicator is based on the Wilshire 5000 and is as of 2019 Q2.
4.8.1 Commodities

As Of: 30-Sep-2019

Index

Agriculture Index
Energy Index
Broad Index

Precious Metals Index
Industrial Metals Index

Source: S&P GSCI Spot Indices, Haver Analytics

Note: 01-Jan-2014 = 100.
4.8.2 Agricultural Prices

As Of: 30-Sep-2019

Source: S&P GSCI Spot Indices, Haver Analytics

Note: Index shown as a share of its 2010-present average.
4.8.3 Agricultural Loans: Noncurrent Rate

As Of: 2019 Q2

Source: FDIC, Haver Analytics
4.9.1 Commercial Paper Outstanding

Trillions of US$  As Of: Sep-2019  Trillions of US$


Source: Federal Reserve, Haver Analytics

Note: Not seasonally adjusted. Domestic includes CP issued in the U.S. by entities with foreign parents.
4.9.2 Commercial Paper Interest Rates

As Of: 30-Sep-2019

|---------|----------------------|---------------------------|-----------------------------|------------------------|-------------------------------|-------------------------------|

Source: Federal Reserve, Haver Analytics
4.9.3 Primary Dealer Repo Agreements

Trillions of US$  As Of: 25-Sep-2019  Trillions of US$

- Overnight/Continuing
- Term

Source: FRBNY, Haver Analytics
4.9.4 Overnight Repo Volumes and Dealer Inventories

**Billions of US$**

**As Of: 25-Sep-2019**

**Billions of US$**

- **Overnight Treasury Repo Volume (right axis)**
- **Primary Dealer Treasury Inventories (left axis)**

Source: FRBNY, Haver Analytics

Note: Overnight Treasury repo volume includes published volumes for SOFR.
4.9.5 Primary Dealer Reverse Repo Agreements

Source: FRBNY, Haver Analytics
4.9.7 Collateral in the Tri-Party Repo Market

As Of: Sep-2019

Source: FRBNY, Haver Analytics

Note: Other includes ABS, CDOs, private label CMOs, international securities, money markets, municipal debt, and whole loans.
4.9.8 SOFR Spread to IOER

Source: Federal Reserve, Haver Analytics
4.9.9 Value of Securities on Loan

As Of: 30-Sep-2019

Trillions of US$

Global Market (including U.S.)

U.S. Market

Source: Markit Group Limited

Note: Data is based on a survey of agent-based lenders.
4.9.10 U.S. Securities Lending Cash Reinvestment

As Of: 2019 Q2

Trillions of US$

Days

Source: The Risk Management Association

Note: Data is based on a survey of agent-based lenders.
4.9.11 U.S. Securities Lending Cash Reinvestment

As Of: 2019 Q2

Percent of Total

Source: The Risk Management Association, Office of Financial Research

Note: Nongovernment repos have collateral of whole loans, equity, and corporate debt. Data is based on a survey of agent-based lenders.
C.1 SOFR Futures

Contracts ‘000s

As Of: Sep-2019

Billions of US$

Average Daily Volume (left axis)

Month-End Open Interest (right axis)

Source: CME
C.2 Issuance of SOFR Linked Notes by Tenor

Billions of US$  As Of: 30-Sep-2019  Billions of US$

Perpetual Bonds
5+ Years
2-5 Years
1-2 Years
< 1 Year

Source: Bloomberg, L.P., Staff Calculations
C.3 Issuance of SOFR Linked Notes by Issuer

As Of: 30-Sep-2019

Billions of US$

- Agriculture & Development Banks
- Corporates: Other Financials
- Corporates: G-SIBs
- FNMA & FHLMC
- FHLBs

Cumulative Issuances (right axis)

Source: Bloomberg, L.P., Staff Calculations
4.10.1 Futures-Spot Price Spread

Source: Bloomberg, L.P.

Note: Represents the percent spread between the front-month future and the spot price.
4.10.2 Market Volatility Indices

Index

As Of: 30-Sep-2019

Index

Crude Oil VIX (right axis)
Treasury VIX (left axis)
VIX (right axis)

Note: Crude VIX and Treasury VIX are implied volatility measures. VIX is the 1-month VIX future.

Source: Bloomberg, L.P.
4.10.3 Leveraged Funds Net Position: Treasury & Eurodollar Futures

Source: CFTC Commitment of Traders Report, Bloomberg, L.P., Staff Calculations

Note: Futures contracts adjusted to represent the estimated dollar value per one basis point (DV01); 10-year includes 10-Year and 10-Year Ultra Treasury Note futures; 30-Year includes Treasury Bond and Ultra Treasury Bond futures.
4.10.4 Normalized Futures Exchange Volume

Source: CFTC
4.10.6 Normalized Futures Exchange Number of Products

Source: CFTC
4.10.7 OTC Options: Global Notional Outstanding

Trillions of US$

As Of: 2019 Q2

Trillions of US$

Foreign Exchange (left axis)

Interest Rate (right axis)

Equity (left axis)

Other (left axis)

Source: BIS, Haver Analytics
4.10.8 OTC Options: BHC Gross Notional Outstanding

As Of: 2019 Q2

Trillions of US$

<table>
<thead>
<tr>
<th>Year</th>
<th>Foreign Exchange</th>
<th>Equity</th>
<th>Interest Rate</th>
<th>Other</th>
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</table>

Source: FR Y-9C, Staff Calculations

Percent Held by 6 Largest BHCs by Total Assets

Note: Other includes credit, commodity, and other OTC options.
4.10.9 OTC Options: BHC Net Notional Outstanding

As Of: 2019 Q2

Trillions of US$

- Other
- Equity
- Foreign Exchange
- Interest Rate

Note: Other includes credit, commodity, and other OTC options.

Source: FR Y-9C, Staff Calculations
4.10.10 Derivatives Notional Amount Outstanding

Source: CFTC Weekly Swaps Report, Haver Analytics

Note: Weekly Swaps Report not issued between Dec. 22, 2018 and Jan. 26, 2019 due to a lapse in government funding; excludes security-based swaps.
Credit Default Swaps
(left axis)

Interest Rate Swaps
(right axis)

Source: CFTC Weekly Swaps Report, Haver Analytics

Note: 12-week moving-averages; excludes security-based swaps.
4.10.13 Global OTC Central Clearing Market Share

Percent

As Of: 2019 Q2

Trillions of US$

Source: BIS, Haver Analytics

- Interest Rate
  - Not Cleared (left axis)
  - Cleared (left axis)
  - Total Notional Outstanding (right axis)

FX

Credit

Equity
4.10.14 Average Clearing Rates for OTC Trading

As Of: 27-Sep-2019

Source: CFTC Weekly Swaps Report, Haver Analytics

Note: 12-week moving-averages; excludes security-based swaps.
4.10.15 Clearing Rates for U.S. Inflation Swap Positions

Source: CFTC
4.10.16 Initial Margin Posted against Cleared FX Positions

Billions of US$  As Of: 30-Sep-2019  Billions of US$

Source: CFTC

Note: 20-day moving-average.
4.10.17 Cleared Initial Margin Requirements

As Of: Sep-2019

Billions of US$

Note: Includes house and customer margin requirements. Futures margin include CME, ICEU, and ICUS. Interest rate swap margin include CME and LCH Ltd. Credit default swap margin include CME, ICC, ICEU, and LCH SA). All data are as of month-end.

Source: CFTC
4.10.18 Margin Funds Held at CFTC Registered FCMs

As Of: Jun-2019

- Swaps
- Foreign Futures
- U.S. Futures

Source: CFTC
4.10.20 FCM Concentration: Customer Futures Balances

Source: CFTC

Note: Represents total amount of funds that an FCM is required to segregate on behalf of customers who are trading futures and options on futures at U.S. exchanges.

financial data for FCMs
4.10.21 FCM Concentration: Customer Swap Balances

Source: CFTC

Financial data for FCMs

Note: Represents the amount of funds an FCM is required to segregate for customers who trade cleared swaps.
Concentration of Swap Positions for Registered SDs

As Of: 2019 Q2

Percent

Top 10  Top 5  Top 3

Note: Positions between two Swap Dealers (SDs) in the same category (e.g., Top 3 or Top 5) are double-counted (i.e., a trade between the #1 SD and #3 SD would be counted twice).

Source: CFTC
Billions of US$ As Of: 27-Sep-2019

4.10.23 On-SEF Weekly Trading Volume

Credit Default Swaps (left axis)

Interest Rate Swaps (right axis)

Note: 12-week moving averages. Excludes security-based swaps.

Source: ISDA SwapsInfo
4.10.24 On-SEF Trading Share

As Of: 27-Sep-2019

Note: Share of notional volume. Excludes security-based swaps. 12-week moving moving averages.

Source: ISDA SwapsInfo
### 4.11.1 Categorization of Large U.S. BHCs

<table>
<thead>
<tr>
<th>Description</th>
<th>U.S. Domestic Banking Org.</th>
</tr>
</thead>
</table>
| **Category 1**  
(U.S. G-SIBs) | Bank of America  
Bank of New York Mellon  
Citigroup  
Goldman Sachs  
JPMorgan Chase  
Morgan Stanley  
State Street  
Wells Fargo |
| **Category II**  
(≥$700b total assets or ≥ $75b in cross-jurisdictional activity) | Northern Trust |
| **Category III**  
(≥$250b total assets or ≥ $75b in nonbank assets, wSTWF, or off-balance sheet exposure) | Capital One  
Charles Schwab  
PNC Financial  
U.S. Bancorp |
| **Category IV**  
(Other firms with $100b to $250b total assets) | Ally Financial  
American Express  
BB&T Corp.  
Citizens Financial  
Discover  
First Third  
Huntington  
KeyCorp  
M&T Bank  
Regions Financial  
SunTrust Inc.  
Synchrony Financial |
| **Other firms**  
($50b to $100b total assets) | Comerica Inc.  
CIT Group Inc.  
E*TRADE Financial  
NY Community Bancorp  
Silicon Valley Bank |

Source: Federal Reserve

Note: Northern Trust is included in Category II because of its large cross-jurisdictional activity.
4.11.2 Total Assets by BHC Type

Source: FR Y-9C
4.11.3 Common Equity Tier 1 Ratios

Percent of RWA

As Of: 2019 Q2

Percent of RWA

Other
Large Noncomplex
Large Complex
G-SIBs

Note: Tier 1 common capital is used as the numerator of the CET1 ratio prior to 2014:Q1 for G-SIBs and large complex BHCs, and prior to 2015:Q1 for large noncomplex and other BHCs. The denominator is risk-weighted assets (RWA). Shaded areas indicate NBER recessions.

Source: FR Y-9C
4.11.4 Payout Rates at U.S. G-SIBs

Note: Payout rates are the ratios of stock repurchases plus cash dividends to net income available to common shareholders (NIAC). NIAC is net income minus preferred dividends. 2019 data are through Q2 and are annualized.
4.11.5 Common Equity Tier 1 Ratios at U.S. G-SIBs

Percent of RWA  

As Of: 2019 Q2  

Percent of RWA

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<td>STT</td>
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</tbody>
</table>

Source: FR-Y9C
4.11.6 Return on Equity and Return on Assets, All BHCs

Note: Dashed lines represent 2001 – 2007 averages. Return on equity is equal to net income divided by average equity. Return on assets is equal to net income divided by average assets.

Source: FR Y-9C
4.11.7 Net Interest Margins

As Of: 2019 Q2

Note: Net interest margin is equal to net interest income divided by the quarterly average of interest-earning assets.

Source: FR Y-9C
4.11.8 Selected Sources of Funding at CCAR BHCs

Percent of Total Assets

As Of: 2019 Q2

Percent of Total Assets

Short-Term Funding

Core Deposits

Long-Term Funding

Source: FR Y-9C

Note: ST funding: liabilities with maturities <= 1 yr, trading liabilities, repos, CP and foreign deposits. LT funding: other borrowed money, subordinated notes and large time deposits with maturities > 1 yr. Core deposits: demand deposits, non-interest bearing balances, transaction accts, money mkt deposits and time deposits < $250K. Gray bars signify NBER recessions.
4.11.9 Effective Deposit Rates by BHC Category

As Of: 2019 Q2

Source: Call Report

Note: Quarterly, Annualized.
### 4.11.10 Delinquency Rates

As Of: 2019 Q2

**Note:** Includes all loans in foreign and domestic offices. Delinquent loans are loans 30 days or more past due or in nonaccrual status. Gray bars signify NBER recessions.

**Source:** FR Y-9C
4.11.11 Credit Card Delinquency Rates

Note: Delinquencies are determined using nonaccrual loans and loans that are past due 30 days or more. Gray bars signify NBER recessions.

Source: Call Report
4.11.12 Auto Loan Delinquency Rates

Percent

As Of: 2019 Q2

Percent

G-SIBs

Large Complex

Other

Large Noncomplex

Note: Delinquencies are determined using nonaccrual loans and loans that are past due 30 days or more.

Source: Call Report
4.11.13 Loans to Nondepository Financial Institutions

Percent of Total Loans

As Of: 2019 Q2

Percent of Total Loans

Source: FR Y-9C
4.11.14 Loan-Loss Reserves

Source: FR Y-9C

Note: Gray bars signify NBER recessions.
4.11.15 Liquidity Coverage Ratio

As Of: 2019 Q2

Source: LCR Disclosures from banks’ websites

Note: The solid line represents the regulatory minimum.
4.11.16 High-Quality Liquid Assets by BHC Type

Percent of Assets

As Of: 2019 Q2

Percent of Assets

Other
Modified LCR (Category IV)
Reduced LCR (Category III)
Full LCR (Category I and II)

Note: HQLA is estimated by adding excess reserves to an estimate of securities that qualify for HQLA. Haircuts and level 2 asset limitations are incorporated into the estimate.

Source: FR Y-9C, FR 2900
4.11.17 Selected Liquid Assets at All BHCs

As Of: 2019 Q2

Source: FR Y-9C, FR 2900
4.11.18 Held-to-Maturity Securities

Percent of Investment Securities

As Of: 2019 Q2

Percent of Investment Securities

Source: Call Report

Note: Investment securities are held-to-maturity securities plus available-for-sale securities. Gray bars signify NBER recessions.
4.11.19 Duration Gap

As Of: 2019 Q2

Note: Duration gap is the approximate weighted-average time of cash inflows less the approximate weighted-average time of cash outflows. Gray bars signify NBER recessions.

Source: Call Report
4.11.20 Bank Stock Performance

As Of: 17-Sep-2019

Source: Bloomberg, L.P.

Note: January 2, 2016 = 100. EU Bank Stock Index created from stock price information for the following banks: BCS, BNPQY, CS, ACA, DB, SAN, UBS. All indexes are created by equally weighting banks.
4.11.21 Price-to-Book for Select U.S. G-SIBs

As Of: Sep-2019

Source: SNL Financial

Note: Month-end values.
Basis Points

As Of: Sep-2019

Basis Points

Source: Bloomberg, L.P.  
Note: Monthly averages.
4.11.23 5-Year CDS Premiums Select Foreign Banks

Basis Points

As Of: Sep-2019

Source: Bloomberg, L.P.

Note: Monthly averages.
4.11.24 Initial and Stressed Capital Ratios

Source: Federal Reserve

Note: For DFAST, 2013-2015 bars show Tier 1 Common Capital Ratio and 2016-2018 bars show CET1 Ratio. The x-axis labels represent the number of banks tested within a given year.
### Non-Objection to Capital Plan

<table>
<thead>
<tr>
<th>Bank of America</th>
<th>Morgan Stanley</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bank of New York Mellon</td>
<td>Northern Trust</td>
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<tr>
<td>Barclays USA</td>
<td>PNC</td>
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<tr>
<td>Capital One Financial</td>
<td>State Street</td>
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<td>Citigroup</td>
<td>TD Group U.S.</td>
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<tr>
<td>DB USA</td>
<td>UBS Americas</td>
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<td>Goldman Sachs</td>
<td>US Bancorp</td>
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<td>HSBC North America Holdings</td>
<td>Wells Fargo</td>
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<td>JPMorgan Chase</td>
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</table>

### Conditional Non-Objection to Capital Plan

<table>
<thead>
<tr>
<th>Credit Suisse Holdings (USA)</th>
</tr>
</thead>
</table>

Source: Federal Reserve
Source: BEA, FDIC, Haver Analytics

4.11.27 Commercial Bank and Thrift Net Income

As Of: 2018 Q4

Billions of US$

Non interest Income
Net Interest Income
Realized Gains/Losses
Net Income

Provisions
Noninterest Expense
Income Tax Expense

Source: FDIC

Note: Includes all FDIC-insured commercial banks and thrifts.
4.11.28 Total Assets of Largest Insured Depository Institutions

Trillions of US$

As Of: 2018

Count (‘000s)

Source: FFIEC Call Report

Number of Insured Depository Institutions (right axis)

Top 10 IDIs (left axis)

Top 100 IDIs (left axis)

Other IDIs (left axis)

Source: FFIEC Call Report
4.11.29 U.S. Branches and Agencies of Foreign Banks: Assets

As Of: 2019 Q2

Source: Federal Reserve, Haver Analytics

Note: Other assets includes government securities, asset-backed securities, and other trading assets.
4.11.30 U.S. Branches and Agencies of Foreign Banks: Liabilities

Trillions of US$

As Of: 2019 Q2

Source: Federal Reserve, Haver Analytics

Note: Other liabilities includes transaction accounts, non-transaction accounts, and other borrowed money.
As Of: 2019 Q2

Source: NCUA

Note: Federally-insured credit unions. Values are annualized.
**4.11.32 Credit Union Deposits**

**Money Market and IRA Deposit Share** (left axis)

**Interest-Sensitive Deposit Share** (right axis)

As Of: 2019 Q2

Note: Federally-insured credit unions. Interest-sensitive deposit share includes money market and IRA deposit share, share certificates, and certain other deposits.

Source: NCUA
4.11.33 Credit Union Net Long-Term Assets

As Of: 2019 Q2

Percent of Total Assets

Source: NCUA
4.12.1 Number of Broker-Dealers and Industry Net Income

Number of Firms

As Of: 2019 Q2

Billions of US$

Source: FINRA
4.12.2 Broker-Dealer Revenues

Billions of US$ As Of: 2019 Q2 Billions of US$

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<td>Advisory, Admin.</td>
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</table>

Source: FINRA
4.12.3 Broker-Dealer Assets and Leverage

Trillions of US$

As Of: 2019 Q2

Source: FINRA

Note: Leverage is the ratio of total assets to total regulatory capital.
4.12.4 Large Broker-Dealer Assets and Leverage by Affiliation

Trillions of US$  As Of: 2019 Q2  Ratio

- FBO-Affiliated Assets (left axis)
- FBO-Affiliated Leverage (right axis)
- BHC-Affiliated Assets (left axis)
- BHC-Affiliated Leverage (right axis)

Note: Covers bank holding company (BHC) and foreign banking organization (FBO) affiliated broker-dealers that are among the 25 largest broker-dealers by assets as of Q2 2019.

Source: FINRA
4.12.5 Insurance Industry Net Income

As Of: 2019 Q2

Life includes accident and health.

Source: NAIC

Note: Life includes accident and health.
4.12.6 Insurance Industry Capital and Surplus

Billions of US$  As Of: 2019 Q2  Percent of Total Assets

Life Capital and Surplus / Assets (right axis)
P&C Capital and Surplus / Assets (right axis)
Life Capital and Surplus (left axis)
P&C Capital and Surplus (left axis)

As Of: 2019 Q2

Note: Total assets includes net admitted assets less net admitted separate account assets. Life includes accident and health.

Source: NAIC
4.12.7 Consumer Loans and Leases Outstanding

As Of: Aug-2019

Source: Federal Reserve, Haver Analytics

Note: Loans and leases owned and securitized. Series breaks in December 2010 and December 2015 due to change in data collection methodology. Gray bars signify NBER recessions.
4.12.8 Business Loans and Leases Outstanding

As Of: Aug-2019

Source: Federal Reserve, Haver Analytics

Note: Loans and leases owned and securitized. Series break in December 2010 due to change in data collection methodology. Gray bars signify NBER recessions.
4.12.9 ABS Issuance

Source: Thomson Reuters, SIFMA

Note: Figures are as of year end through 2018. 2019 figures are through September.
Select ABS Spreads

Basis Points

As Of: 26-Sep-2019

Basis Points

Subprime Auto Fixed BBB 3-Year
Prime Auto Fixed AAA 3-Year
Credit Card Fixed AAA 3-Year

Source: J.P. Morgan
Source: Bloomberg, L.P.

Note: P/B ratio is weighted by market capitalization. Not all agency REITs existed in all time periods in the figure.
4.12.12 Agency REIT Assets and Leverage

As Of: 2019 Q2

Leverage (left axis)

Source: Bloomberg, L.P.

Note: Leverage is the ratio of total assets to equity. Not all agency REITs existed in all time periods in the figure.
4.13.1 MMF Assets by Fund Type

As Of: Sep-2019

Trillions of US$

- Tax-Exempt
- Government and Treasury
- Prime

Source: SEC
4.13.2 Liquid Asset Shares of Prime MMFs

Percent of Total Assets

As Of: Sep-2019

Percent of Total Assets

Source: SEC
4.13.3 Weighted Average Maturity by Fund Type

As Of: Sep-2019

Source: SEC
4.13.4 Net Assets of the Investment Company Industry

Trillions of US$

As Of: 2019 Q3

Other
ETFs
MMFs
Bond/Hybrid Mutual Funds
Equity Mutual Funds

Note: Other is composed of unit investment trusts and closed-end funds. Q3 2019 figures include 2018 UIT data, which is reported annually.

Source: ICI, Haver Analytics
4.13.5 Monthly Bond Mutual Fund Flows

Billions of US$  As Of: Sep-2019  Billions of US$

- Source: ICI, Haver Analytics
4.13.6 Monthly Equity Mutual Fund Flows

Billions of US$ As Of: Sep-2019 Billions of US$

Source: ICI, Haver Analytics
4.13.7 Monthly Bank Loan and High-Yield Fund Flows

As Of: Sep-2019

Source: Morningstar, Inc.
4.13.8 Cumulative Equity Fund Flows

Trillions of US$ As Of: Sep-2019 Trillions of US$

International Passively Managed
International Actively Managed
U.S. Passively Managed
U.S. Actively Managed

Source: Morningstar, Inc.
Note: Includes ETFs and mutual funds.
4.13.9 U.S.-Listed ETP AUM

<table>
<thead>
<tr>
<th>Year</th>
<th>AUM</th>
<th>Cumulative Market Appreciation</th>
<th>Cumulative Flows to ETPs</th>
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<td>2019</td>
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</tbody>
</table>

Source: Morningstar, Inc.
4.13.10 Retirement Fund Assets by Plan Type

As Of: 2019 Q2

Trillions of US$

- Individual Accounts
- Private Defined Contribution Plans
- Private Defined Benefit Plans
- State and Local
- Federal

Note: Individual accounts as of 2019 Q1.

Source: Federal Reserve, Haver Analytics
4.13.11 Public and Private Pension Funding Levels

Source: NASRA Public Fund Survey, Milliman
2018 Corporate Pension Funding Study
4.13.12 North American Private Equity AUM

As Of: 2018

Source: Preqin
4.13.13 M&A Loan Volume for Private Equity-Backed Issuers

Bсорnions of US$

As Of: 30-Sep-2019

Bصورions of US$

Source: S&P LCD
**4.13.14 North American Private Debt AUM**

Bilions of US$  

As Of: Mar-2019

Bilions of US$

<table>
<thead>
<tr>
<th>Year</th>
<th>Dry Powder</th>
<th>Unrealized Value</th>
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<tr>
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<td>2019</td>
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</tbody>
</table>

Source: Preqin

Note: 2005-2018 figures as of year-end. Includes all North American private debt funds (excluding funds of funds).
4.13.15 North American Private Debt Fundraising

Billions of US$

As Of: Sep-2019

Billions of US$

Source: Preqin

Note: Includes all North American private debt funds (excluding funds of funds).
4.14.1 Market Capitalization of Blockchain-Based Digital Assets

Billion of US$  As Of: 30-Sep-2019  Billions of US$

Litecoin  Ripple  Etherum  Bitcoin  Tether

Source: Coinmarketcap.com, Office of Financial Research