Callan Institute

Fourth Quarter 2019

Capital Market Review

Anticipated Recession Fails to Materialize

ECONOMY

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GDP grew at 2.1% for the fourth quarter, unemployment fell to a generational low, wages and incomes showed robust gains, inflation remained contained, and, of course, stock and bond markets soared in 2019. So much for the most anticipated recession in history.

Strong Gains for Year Amid Equity Boom

INSTITUTIONAL INVESTORS

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Corporate DB plans gained the most among plan types in 2019. Over the last 20 years, public DB plans topped the performance list, but all plan types rose in a narrowly bound range between 6.0%-6.1%, exceeding a 60% stocks-40% bonds benchmark.

Jump in Quarter Fuels Notable Year

EQUITY

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The fourth quarter closed out a near-historic year for equity markets; the S&P 500 ended 2019 up 31.5%—enough to become the second-strongest year of the decade. Global equity markets bounced back in the fourth quarter as geopolitical uncertainties abated.

Yields Are Mixed but Returns Are Strong

FIXED INCOME

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Yield movement was mixed in the U.S. as short-term rates fell and long-term rates rose amid ongoing trade negotiations. Major U.S. bond indices showed strong gains for the year. Global fixed income markets also posted broad increases for the quarter and the year.

Real Estate Healthy; Real Assets Gain

REAL ESTATE/REAL ASSETS

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U.S. core real estate returns continued to moderate; Industrial outperformed other property types. REITs gained but lagged global equities. Asian and European markets were affected by geopolitical tensions. Real assets returns were strong in the quarter.

Most Activity Fell Moderately in 2019

PRIVATE EQUITY

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Except for fundraising, all private equity activity measures declined moderately in 2019. The drops largely owe to record-level prices throughout the year. But overall private equity and capital market liquidity remained healthy and transaction volume is brisk.

Party Like It's 1999 … or Not

HEDGE FUNDS/MACs

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While stocks celebrated the end of 2019, hedge funds were the party's designated driver. Portfolios exposed to EM and long-short equity topped those emphasizing equity market neutral or macro strategies. MAC returns varied depending on net market exposures.

DC Index Gains, Tops Age 45 TDF

DEFINED CONTRIBUTION

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The Callan DC Index™ rose 0.6% in the third quarter, compared to 0.5% for the Age 45 Target Date Fund. The Index's growth in balances of 0.1% was much smaller than the first and second quarters. Asset allocation to TDFs hit 29.6%, the lowest since the first quarter of 2017.

Broad Market Quarterly Returns

U.S. Equity Russell 3000	Global ex-U.S. Equity MSCI ACWI ex USA	U.S. Fixed Income Bloomberg Barclays Agg	Global ex-U.S. Fixed Income Bloomberg Barclays Gbl ex US
9.1%	8.9%	0.2%	0.7%

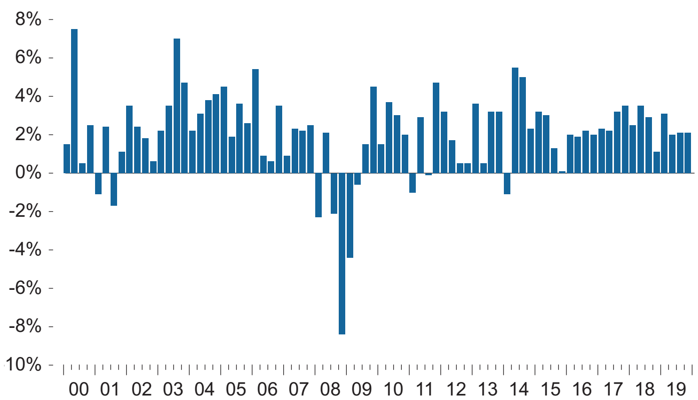
Sources: Bloomberg Barclays, FTSE Russell, MSCI

The Most Anticipated Recession in History Fails to Materialize

ECONOMY | Jay Kloepfer

Real GDP grew at 2.1% for the fourth quarter of 2019, capping off a year pretty much no one anticipated for growth or the capital markets. GDP growth for the year came in at 2.3%, unemployment fell to yet another generational low, wages and incomes continued to show robust gains, and yet inflation remained contained. The Fed paused on its path to interest rate normalization in January 2019, cut rates twice in the third quarter and once more in October, before declaring its work done. The trade war dominated headlines and jerked around market sentiment, but the actual impact on U.S. GDP growth has been held below a cumulative hit of 1 percentage point.

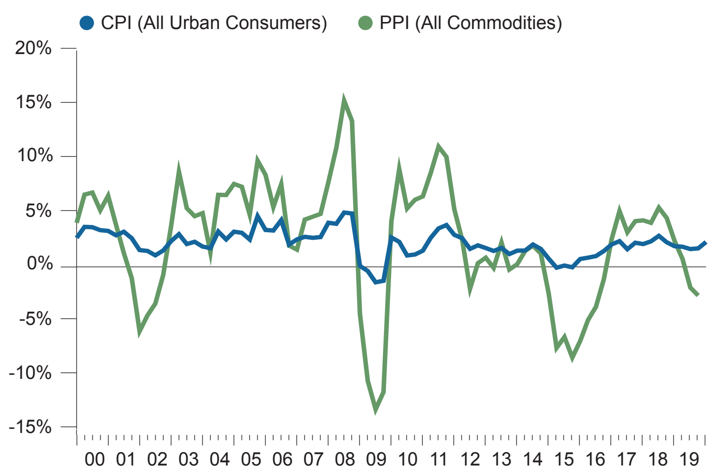
Quarterly Real GDP Growth (20 Years)



Source: Bureau of Economic Analysis

Stock markets around the globe rallied during 2019, with the **S&P 500** climbing 31.5%, **MSCI ACWI ex-USA** up 21.5%, and **MSCI Emerging Markets** up 18.4%. The most eye-opening development of the year was the bond market rally following the Fed pivot in policy, driving a gain of 8.7% for the **Bloomberg Barclays US Aggregate Bond Index** and almost 20% for the **Long Government/Credit Index.** So much for the most anticipated recession in history.

Inflation Year-Over-Year



Source: Bureau of Labor Statistics

Many analysts have begun touting that we already touched bottom in the global growth cycle during the fourth quarter of 2019. The "growth recession" was over before we knew it was fully upon us. The consensus short-term outlook is far more bullish than it was a year ago, although the medium-term outlook (three to five years) contains more concerns. Persistent low inflation gives central banks the cover to continue supportive monetary policy, but this support could evaporate if inflation is resurgent. The volume of corporate credit has exploded, and much of it is lower rated; any sign of real weakness in the economy raises concerns about quality and spread widening. Finally, it is entirely unclear how the current negative interest rate environment across much of Europe evolves.

Buried in the GDP numbers are several developments that support continuing growth in the U.S. economy, at least over the shorter term. First, the 2.1% increase in the fourth quarter includes the drag on growth from the GM strike and the slowdown in Boeing 737 Max production.

Second, inventory accumulation slowed substantially in the fourth quarter, another drag on growth. The end of the GM strike, the eventual resumption of 737 Max production, and the rebuilding of inventories all point toward sustained growth in the U.S. in 2020.

Consumer spending remains strong, fueled by buoyant consumer confidence, a strong labor market, a generational low unemployment rate (3.5%), and personal income growth of just under 4%. The reversal in interest rates will find its way into lower debt costs for consumers, and household debt levels are far below pre-GFC levels. The Fed lowered the federal funds rate by 75 basis points, and given expectations for three rate INCREASES a year ago, rates now sit 150 bps lower than expected. This Fed pivot has greatly benefited interest-sensitive sectors of the economy and consumer balance sheets.

One more support for GDP growth has been a reduction in imports (which are a negative in the GDP calculation), and a corresponding increase in net exports. Imports surged in advance of the application of tariffs early in 2019. U.S. suppliers appear to have quickly found alternatives to China, increasing our imports from Asian countries ex-China to offset some of the decline in imports from China.

Not only did the recession not appear in 2019, near-term recession risks are abating. The announced phase one trade deal between the U.S. and China will suspend some tariffs and address issues of intellectual property and forced transfers of technology. The largest impact is on investor and business sentiment. World GDP growth slowed from 4% at the end of 2017 to below 3% by mid-2019, as a collection of negative shocks (Brexit, trade, geopolitical uncertainty) and lagged effects of monetary tightening hit some of the world's largest economies. The drag from these shocks has faded and monetary policy has loosened around the world. The emerging markets have already embarked on a cyclical upturn, and the developed economies are about to join them, led by the U.S. The fourth quarter of 2019 likely marked the trough in global GDP growth. The recovery in trade should help lead the way, after the collapse in trade volumes in late 2018.

The Long-Term View

Index	2019 4th Qtr	Periods Ended 12/31/19 Year	5 Yrs	10 Yrs	25 Yrs
U.S. Equity					
Russell 3000	9.1	31.0	11.2	13.4	10.2
S&P 500	9.1	31.5	11.7	13.6	10.2
Russell 2000	9.9	25.5	8.2	11.8	9.4
Global ex-U.S. Equity					
MSCI EAFE	8.2	22.0	5.7	5.5	5.2
MSCI ACWI ex USA	8.9	21.5	5.5	5.0	--
MSCI Emerging Markets	11.8	18.4	5.6	3.7	--
MSCI ACWI ex USA Small Cap	11.0	22.4	7.0	6.9	5.9
Fixed Income					
Bloomberg Barclays Agg	0.2	8.7	3.0	3.7	5.6
90-Day T-Bill	0.5	2.3	1.1	0.6	2.5
Bloomberg Barclays Long G/C	-1.1	19.6	5.4	7.6	7.9
Bloomberg Barclays Gl Agg ex US	0.7	5.1	1.6	1.5	4.4
Real Estate					
NCREIF Property	1.5	6.4	8.2	10.2	9.3
FTSE Nareit Equity	-0.8	26.0	7.2	11.9	10.6
Alternatives					
CS Hedge Fund	2.4	9.3	2.6	4.3	7.8
Cambridge PE*	0.9	9.5	12.4	13.8	15.3
Bloomberg Commodity	4.4	7.7	-3.9	-4.7	1.7
Gold Spot Price	3.4	18.9	5.2	3.3	5.7
Inflation – CPI-U	0.1	2.3	1.8	1.8	2.2

*Data for most recent period lags by a quarter. Data as of Sept. 30, 2019.
Sources: Bloomberg, Bloomberg Barclays, Bureau of Economic Analysis, Credit Suisse, FTSE Russell, MSCI, NCREIF, S&P Dow Jones Indices, Refinitiv/Cambridge

Recent Quarterly Economic Indicators

	4Q19	3Q19	2Q19	1Q19	4Q18	3Q18	2Q18	1Q18
Employment Cost–Total Compensation Growth	2.7%	2.8%	2.7%	2.8%	2.9%	2.8%	2.8%	2.7%
Nonfarm Business–Productivity Growth	0.0%*	-0.2%	2.5%	3.5%	0.1%	1.2%	1.8%	0.9%
GDP Growth	2.1%	2.1%	2.0%	3.1%	1.1%	2.9%	3.5%	2.5%
Manufacturing Capacity Utilization	74.9%	75.4%	75.5%	76.4%	77.0%	76.9%	76.4%	76.1%
Consumer Sentiment Index (1966=100)	97.2	93.8	98.4	94.5	98.2	98.1	98.3	98.9

Sources: Bureau of Economic Analysis, Bureau of Labor Statistics, Federal Reserve, IHS Economics, Reuters/University of Michigan

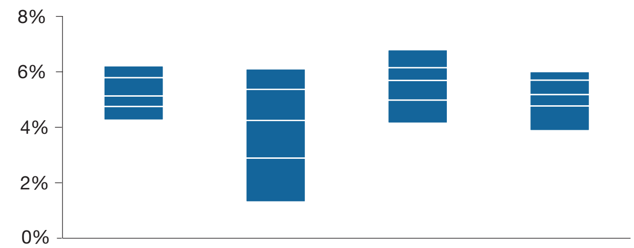
* Estimated figure provided by IHS Markit

Steady Returns Continue Amid Equities Rebound

INSTITUTIONAL INVESTORS

- A quarterly rebalanced 60% S&P 500/40% Bloomberg Barclays Aggregate portfolio increased 22.2% over the one year ended Dec. 31, 2019, driven by the stock market's huge gains and exceptionally strong returns from bonds. All broad institutional investor groups underperformed this benchmark.
- U.S. equity markets continued their pattern of outperforming global ex-U.S. equity, a pattern that has persisted since 2018.
- Corporate defined benefit (DB) plans gained the most among plan types over the one-year period. Public DB plans trailed all investor types.
- Over most longer time periods, Taft-Hartley plans have been the top performer. Over the last 20 years, public DB plans topped the performance list, but all plan types rose in a narrowly bound range between 6.0%-6.1%. In that time period, all plan types exceeded the stocks-bonds benchmark.
- In the current market environment, institutional investors are focused on reevaluating the purpose and implementation of all diversifiers, including real assets, hedge funds and liquid alternatives, fixed income, and private markets.

Quarterly Returns, Callan Database Groups



	Public Database	Corporate Database	Nonprofit Database	Taft-Hartley Database
10th Percentile	6.22	6.11	6.80	6.01
25th Percentile	5.79	5.37	6.15	5.70
Median	5.13	4.25	5.69	5.18
75th Percentile	4.75	2.89	4.98	4.77
90th Percentile	4.26	1.31	4.15	3.88

Source: Callan

- Return enhancement remains a top priority for public and corporate DB plans and nonprofits. Corporate DB plans also see funding status as a top priority. DC plans see fees as the top priority.
- Public DB plans are also concerned about their high risk exposures but resist de-risking when their shorter-horizon projected return on assets (ROA) is lower than their long-term ROA.

Callan Database Median and Index Returns* for Periods Ended 12/31/19

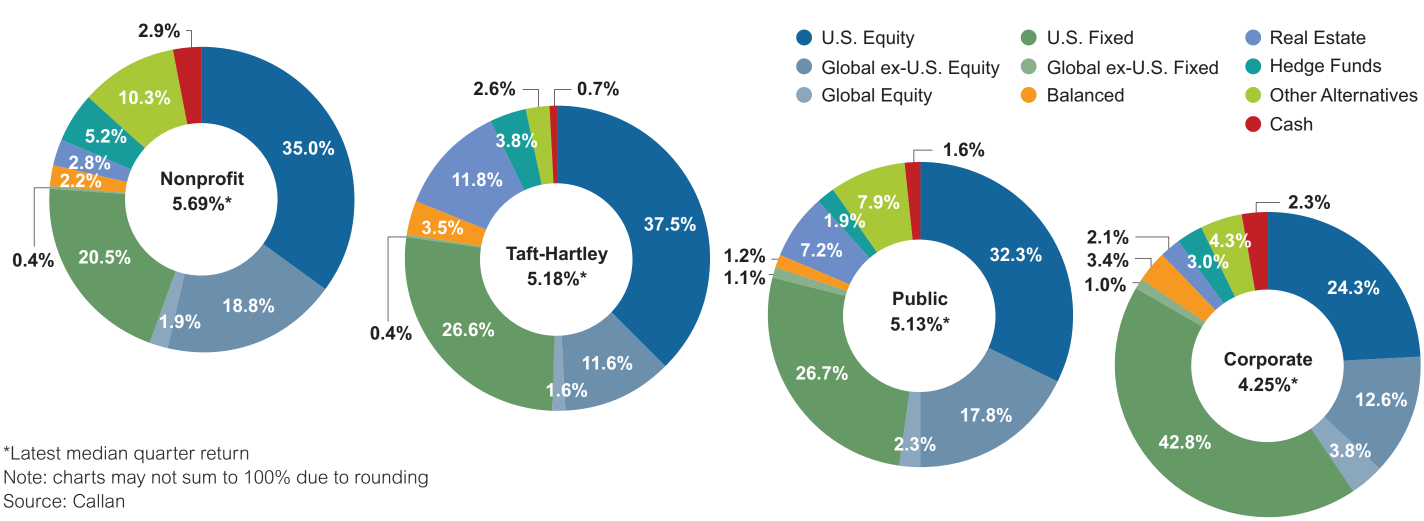
Database Group	Quarter	Year	3 Years	5 Years	10 Years	15 Years
Public Database	**5.13**	**17.75**	**9.40**	**7.11**	**8.25**	**6.73**
Corporate Database	**4.25**	**19.87**	**9.55**	**6.96**	**8.40**	**6.80**
Nonprofit Database	**5.69**	**18.81**	**9.38**	**6.81**	**8.12**	**6.58**
Taft-Hartley Database	**5.18**	**18.00**	**9.36**	**7.50**	**8.66**	**6.59**
All Institutional Investors	**5.19**	**18.53**	**9.41**	**7.08**	**8.35**	**6.67**
Large (>$1 billion)	**4.79**	**17.56**	**9.59**	**7.26**	**8.59**	**6.88**
Medium ($100mm - $1bn)	**5.20**	**18.55**	**9.42**	**7.15**	**8.35**	**6.58**
Small (<$100 million)	**5.38**	**18.93**	**9.29**	**6.91**	**8.16**	**6.55**

*Returns less than one year are not annualized.

Source: Callan. Callan's database includes the following groups: public defined benefit, corporate defined benefit, nonprofits, and Taft-Hartley plans. Approximately 10% to 15% of the database constituents are Callan's clients. All database group returns presented gross of fees. Past performance is no guarantee of future results. Reference to or inclusion in this report of any product, service, or entity should not be construed as a recommendation, approval, affiliation, or endorsement of such product, service, or entity by Callan.

- Callan has seen a surge in asset-liability studies, with substantial changes to many policy portfolios.
- Institutional investors are also taking steps to de-risk (less equity) and looking at risk mitigation (diversification and implementation), but there is some dissatisfaction with hedge funds, risk premia, and absolute return strategies. Some DB plans have terminated their hedge fund exposures; thus far, nonprofits have largely retained confidence in their hedge fund allocations.
- There are continued signs of interest in environmental, social, and governance (ESG) factors, with many public DB plans having had some discussions around the subject.
- Defined contribution (DC) plans are grappling with the implications of the SECURE Act (for Setting Every Community Up for Retirement Enhancement), whose sweeping nature means that the impact on policy cannot be underestimated within the retirement industry, since major changes (target date funds, auto features, etc.) were largely driven by previous regulatory and legislative catalysts.
- DC plans are also continuing to examine their default option, looking at the suitability of the current option in light of other alternatives both in the same asset class (often target date funds) but also in light of other options (e.g., managed accounts).
- In assessing the capital market environment, institutional investors are focused on how long the current expansion can continue. In evaluating specific investment alternatives, they face three key questions:
  1. Is value dead?
  2. Is there any hope for active management?
  3. Why should they bother with global ex-U.S. equities?
- For investors, the reversal in Fed policy has changed the landscape. It has created an added role for central banks, that of sustaining the expansion, which is a positive for equity ownership. The new yield environment and capital market assumptions going forward also create a challenge for investors, as they try to determine how to diversify their growth/equity risk without incurring a huge opportunity cost.
- In examining alternatives, institutional investors are looking at the most effective ways they can implement allocations in the private market. Is it worth the trouble to create a bespoke program implementation, and at what size and how much effort is required? This applies to private equity, real assets, absolute return, and diversifying assets.

Average Asset Allocation, Callan Database Groups



*Latest median quarter return
Note: charts may not sum to 100% due to rounding
Source: Callan

Equity

U.S. Equities

The fourth quarter closed out a near-historic year for equity markets, in particular the S&P 500, which ended 2019 up 31.5%—enough to claim second place behind 2013 for the strongest year of the decade (during which large cap equities only saw one down year). Both Apple (+85%) and Microsoft (+54%) reached over $1 trillion in market cap and accounted for 15% of the S&P 500's advance for the year. Investors globally were spurred by three interest rate cuts by the Fed, a potential U.S.-China trade armistice, continued low inflation, and some clarity around Brexit.

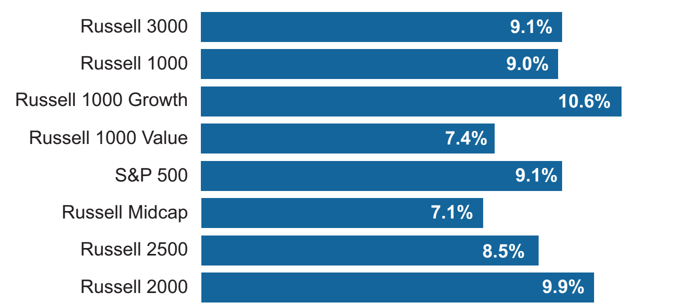
Small cap vs. large cap ► *Russell 2000: +9.9% | Russell 1000: +9.0%*

– Small cap trailed for most of 2019 but eclipsed large cap stocks in the fourth quarter due to notable contributions from the Health Care sector, where the biotech and pharmaceutical industries saw heightened new drug approvals and M&A activity during the quarter.
– Small growth outpaced small value for the quarter, the year, and the decade; the **Russell 2000 Growth Index** outpaced the **Russell 2000 Value Index** by 3% annualized over the past 10 years as the low interest rate environment favored growth stocks and challenged the Russell 2000 Value's heavy exposure to Financials.
– While small cap outpaced large cap in the fourth quarter, large cap stocks led for the third straight year, owing much to Tech (+50.3%) and Communication Services (+32.7%).

Growth vs. Value ► *Russell 1000 Growth: +10.6% | Russell 1000 Value: +7.4%*

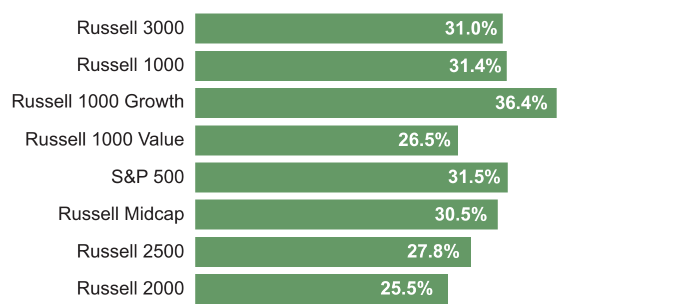
– Growth continued its dominance over value during the quarter, closing out a decade-long trend.
– Tech giants Facebook, Apple, Microsoft, and Alphabet/Google remained meaningful contributors for the quarter, with Health Care (+14.4%) also among the top sector performers.

U.S. Equity: Quarterly Returns



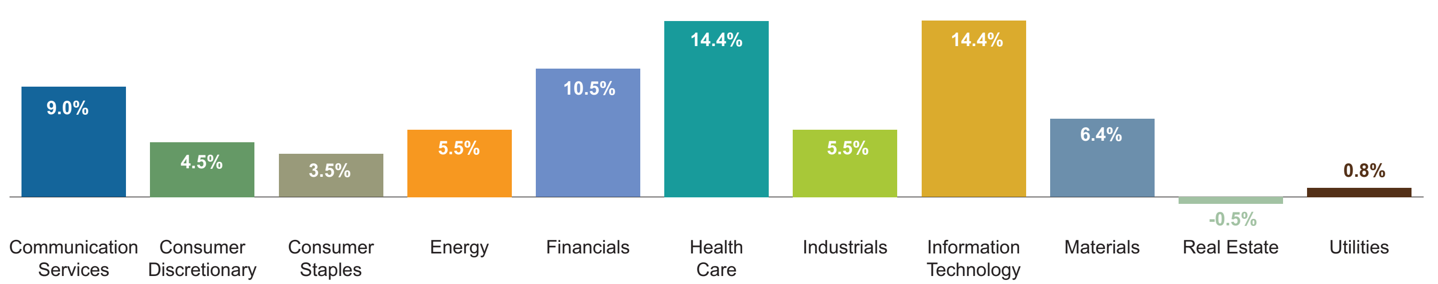
Sources: FTSE Russell and S&P Dow Jones Indices

U.S. Equity: One-Year Returns



Sources: FTSE Russell and S&P Dow Jones Indices

Quarterly Performance of Industry Sectors



Source: S&P Dow Jones Indices

– The fourth quarter saw a rotation away from the more defensive sectors (e.g., Consumer Staples (+3.5%), Utilities (+0.8%), and Real Estate (-0.5%)) and into Cyclicals, further supporting growth stocks.

Global/Global ex-U.S. Equity

Global equity markets bounced back in the fourth quarter as uncertainties abated. De-escalation of the U.S.-China trade war coupled with some Brexit clarity boosted markets. With this backdrop, trade-related areas of the market led the rally.

Global/Developed ex-U.S. ► *MSCI EAFE: +8.2% | MSCI World ex USA: +8.0% | MSCI ACWI ex USA: +8.9% | MSCI Pacific ex Japan: +5.8% | MSCI Japan: +7.6%*

- British Prime Minister Boris Johnson gained command of the Parliament as a result of the Dec. 12 election, adding further clarity to Brexit and sparking the pound to its best quarterly results in a decade by rising 7.5% relative to the dollar.
- Accommodative policies such as a fiscal stimulus program and dovish monetary rhetoric continued to support the Japanese economy and its market.
- Despite GDP contraction of 3.2% and its first recession in a decade due to political protests, Hong Kong rose 7.3% as U.S.-China trade tensions improved.
- Every sector rose, led by Technology.

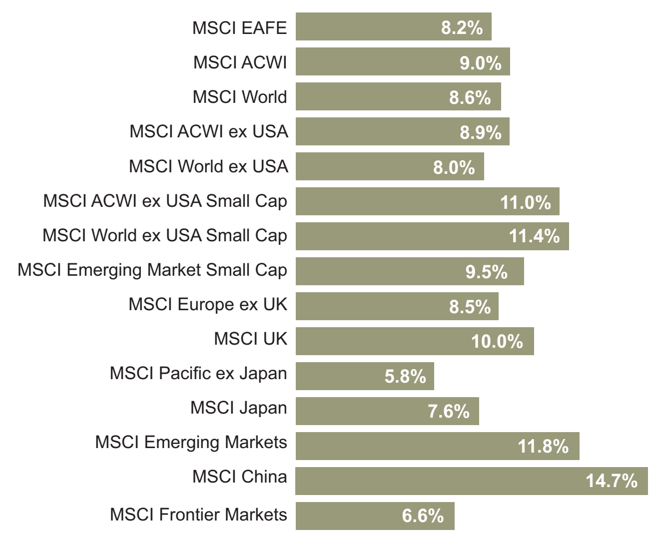
Emerging Markets ► *MSCI Emerging Markets Index: +11.8%*

- Emerging markets were the best-performing among the global ex-U.S. markets as trade war uncertainty receded.
- China soared 14.7% with easing trade tensions and expected fiscal and monetary stimulus packages in 2020.
- Brazil posted a 14.2% gain, its best quarter since late 2017, emboldened by President Jair Bolsonaro's deregulation policies, the country's 1.2% GDP growth, and pending pension reform.
- Russia was the best-performing country in 2019 (+50.9%) and a top five performer in the quarter (+16.8%) as rising oil prices over the past year helped fuel sentiment.
- Every sector generated positive returns, led by Asian technology companies, given the "phase one" trade deal, chip demands for 5G, and growth in China.

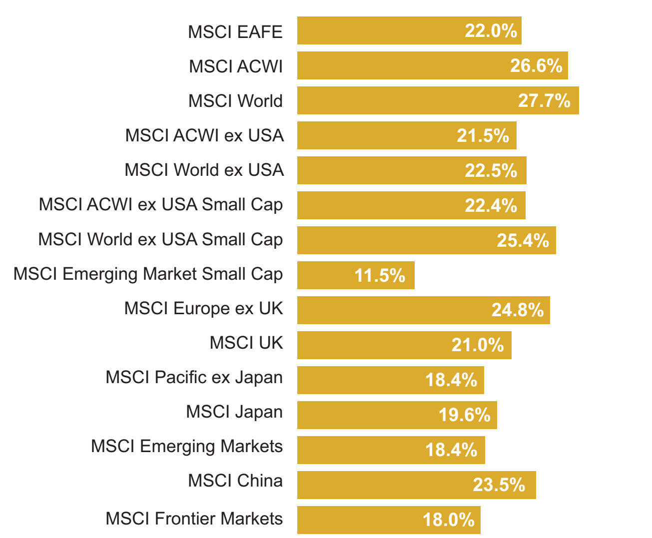
Global ex-U.S. Small Cap ► *MSCI World ex USA Small Cap: +11.4% | MSCI EM Small Cap: +9.5%*

- The "risk-on" market environment triggered by the U.S.-China trade war de-escalation enabled small caps to outperform large caps.
- Additional Brexit clarity drove the U.K. as the top country performer (+19.4%) within developed ex-U.S.
- Argentina (+33.5%) and Brazil (+24.8%) were two of the top EM country performers as key appointments in the Argentinian government, and deregulation and pension reform in Brazil, boosted market sentiment.

Global ex-U.S. Equity: Quarterly Returns (U.S. Dollar)



Global ex-U.S. Equity: One-Year Returns (U.S. Dollar)



Source: MSCI

Fixed Income

The Federal Open Market Committee (FOMC) cut short-term interest rates by 25 basis points once in the fourth quarter to 1.50%-1.75%, citing weak business investment and export data, along with muted inflation. The overall economic backdrop remained strong supported by a solid labor market, which led to a pause in rate cuts at the most recent FOMC meeting. The FOMC indicated its current monetary policy stance is appropriate to sustain the economic expansion. The European Central Bank kept rates steady while continuing to purchase assets in the open market. Yield movement was mixed in the U.S. as short-term rates fell and long-term rates rose amid ongoing trade negotiations.

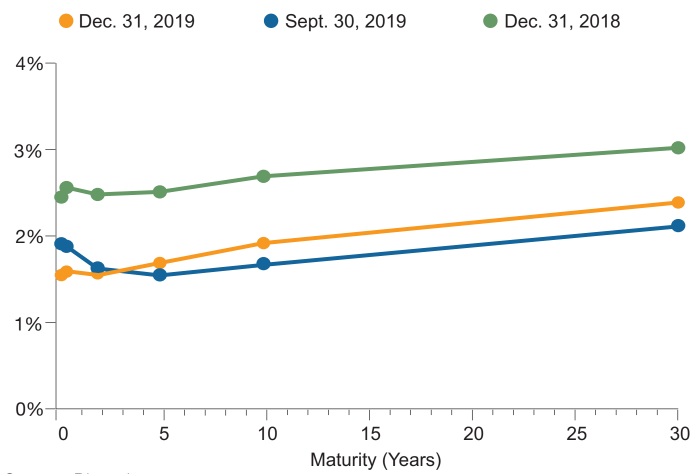
Core Fixed Income ► *Bloomberg Barclays US Agg: +0.2%*

- Treasuries fell 0.8% as the Treasury yield curve steepened, with yields falling on the short end and rising modestly in the intermediate and long end of the curve on expectations of stronger economic growth.
- The spread between the 2-year and 10-year Treasury remained positive, ending the year at 34 bps.
- Long Treasuries fell 4.1% as the 30-year yield rose 27 bps to end the year at 2.39% as investors favored risk assets.
- TIPS outperformed nominal Treasuries as inflation expectations rose; the 10-year breakeven spread was 1.77% at quarter end, up from 1.53% as of Sept. 30.

Investment-Grade Corporates ► *Bloomberg Barclays Corporate (Inv. Grade): +1.2%*

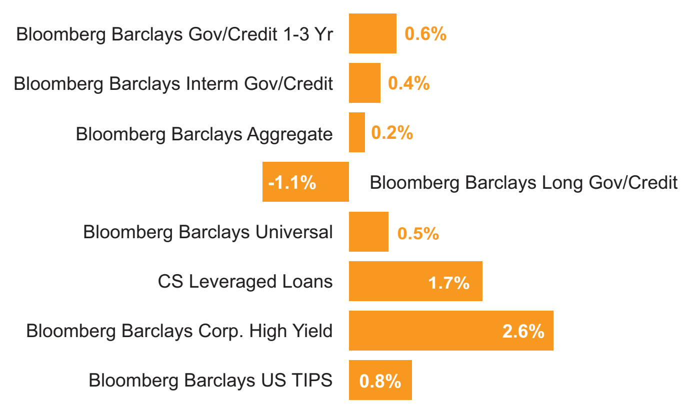
- Investment grade corporate credit spreads narrowed in the fourth quarter and posted the best results within the Bloomberg Barclays US Aggregate Bond Index amid a risk-on market environment; BBB-rated corporates (+1.7%) outperformed single A-rated or higher corporates (+0.7%), indicating investors' willingness to extend risk down the credit spectrum.
- Issuance in the corporate bond market was $200 billion in the fourth quarter, which was $8 billion lower than that from a year ago. Issuance was $140 billion lower compared to

U.S. Treasury Yield Curves



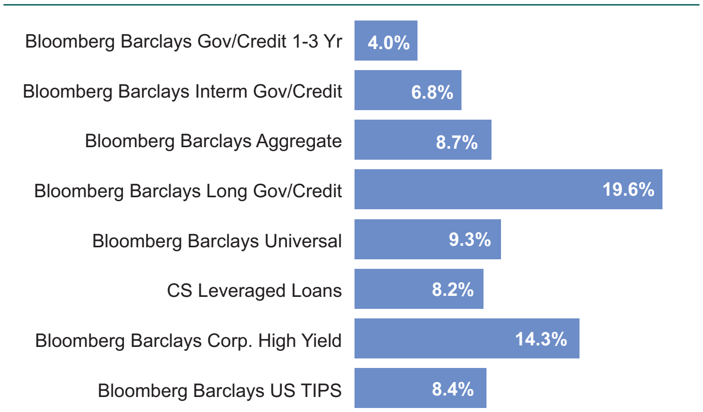
Source: Bloomberg

U.S. Fixed Income: Quarterly Returns



Sources: Bloomberg Barclays and Credit Suisse

U.S. Fixed Income: One-Year Returns



Sources: Bloomberg Barclays and Credit Suisse the third quarter, as is typical toward year-end; demand remained strong amid the risk-on market tone as global investors continued their hunt for positive-yielding assets.

High Yield ► *Bloomberg Barclays Corporate HY: +2.6%*

- CCC-rated corporates (+3.7%) outperformed BB-rated corporates (+2.5%), as the risk-on market sentiment spurred demand for lower-rated securities.
- Spreads across credit quality buckets tightened in the fourth quarter, as the market anticipated improvements in credit fundamentals.

Leveraged Loans ► *CS Leveraged Loans: +1.7%*

- Bank loans, which have floating-rate coupons, underperformed high yield as investors shunned loans in favor of high yield bonds.
- CLO issuance remained consistent, providing technical support for the leveraged loan market.

Global Fixed Income ► *Bloomberg Barclays Global Aggregate (unhedged): +0.5% | (hedged): -0.5%*

- Developed market sovereign bond yields rose modestly in the fourth quarter as global financial conditions improved, but ended lower on the year. The ECB kept the deposit rate steady at its December meeting; negative-yielding debt totaled less than $12 trillion, down from $17 trillion in the third quarter.
- The U.S. dollar declined in the fourth quarter versus the euro, Australian dollar, and British pound; however, it had a modest gain versus the Japanese yen.

Emerging Market Debt ($US) ► *JPM EMBI Global Diversified: +1.8%* | (Local currency) ► *JPM GBI-EM Global Diversified: +5.2%*

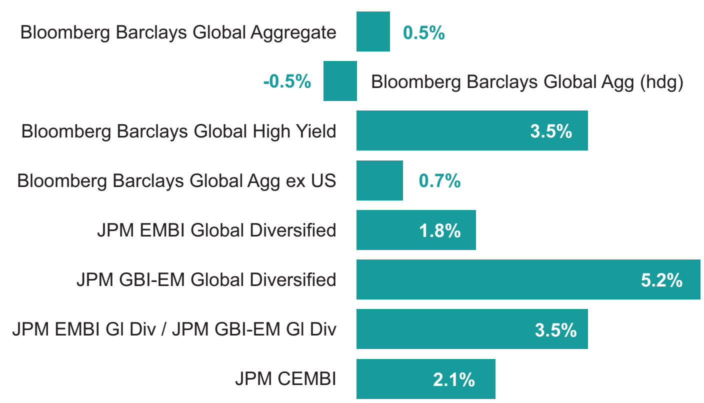
- Broadly, emerging market debt benefited from dovish global central banks and a risk-on environment.
- Within the dollar-denominated benchmark, which posted mixed results, Lebanon (-29.4%) was an outlier as the debt-to-GDP ratio continued to swell and anti-government protests persisted; Argentina rallied (+20.8%) to end the year down 23.6% as a new president was inaugurated.

Change in 10-Year Global Government Bond Yields

3Q19 to 4Q19

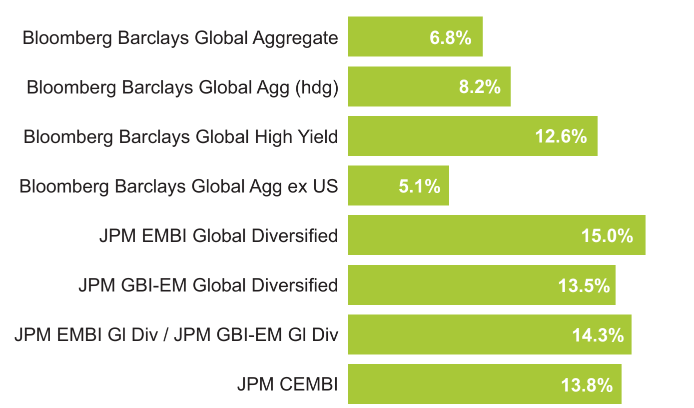
Source: Bloomberg Barclays

Global ex-U.S. Fixed Income: Quarterly Returns



Sources: Bloomberg Barclays and JPMorgan Chase

Global ex-U.S. Fixed Income: One-Year Returns



Sources: Bloomberg Barclays and JPMorgan Chase

Returns in the local debt benchmark were largely positive, with only Chile (-6.2%) and the Dominican Republic (-0.7%) declining. South Africa (+10.2%) and Russia (+10.0%) were top performers.

Real Estate Stays the Course; Real Assets See Strong Gains

REAL ESTATE/REAL ASSETS | Munir Iman and David Welsch

Returns continue to moderate

- U.S. core real estate returns continued to be driven by income, with limited appreciation this late in the cycle.
- Returns came from net operating income (NOI) growth rather than further capitalization rate compression.
- Industrial kept outperforming other property types.
- Retail continued to show signs of depreciation.
- Defensive posturing and disciplined asset acquisitions were critical.

U.S. real estate fundamentals remain healthy

- Steady returns continued, driven by above inflation-level rent growth in many metro areas.
- Within the **NCREIF Property Index,** the vacancy rate for Industrial decreased; all other property types increased.
- NOI has been growing annually and is expected to be the primary return driver. Office, Apartment, and Industrial NOI growth have fallen slightly since the third quarter of 2019.

Pricing remains expensive in the U.S.

- Transaction volumes increased and remained robust.
- Capitalization rates fell slightly; the market remained close to full valuations.

Global equities outperform REITs

- Global REITs gained 2.0% in the fourth quarter compared to 9.1% for global equities (**MSCI ACWI IMI**).
- U.S. and global ex-U.S. REITs were trading just below NAV.
- Large cap stocks, especially those with higher debt levels, modestly outperformed.
- U.S. REITs lost 1.0% in the fourth quarter, lagging the S&P 500 Index, which rose 9.1%.

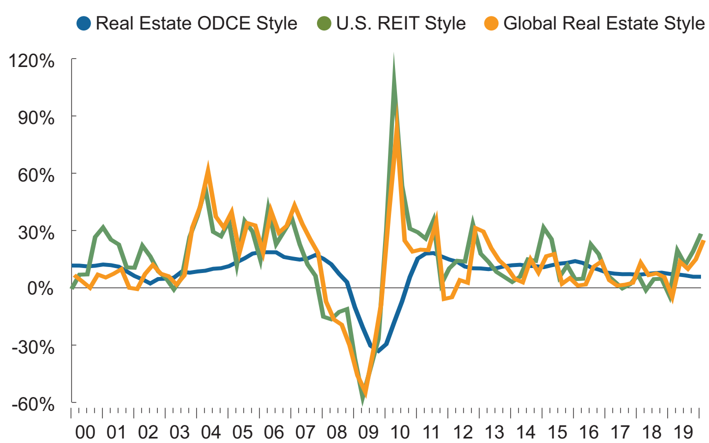
Asia impacted by trade tensions

- U.S.-China trade talks and unrest in Hong Kong impacted real estate markets in the region. Managers continued to find attractive opportunities in some sectors of the market such as restructuring opportunities, necessity-based retail, multi-family rental, and logistics.
- The number of open-end core funds operating in the Asia Pacific market, primarily focused on Japan, Australia, South Korea, and Singapore, increased over recent years and includes both sector-diversified and sector-specific (e.g., logistics) funds.
- India had its first successful REIT IPO in 2019, contributing to the institutionalization of the asset class in that country.

Fundamentals remain strong in Europe's gateway markets

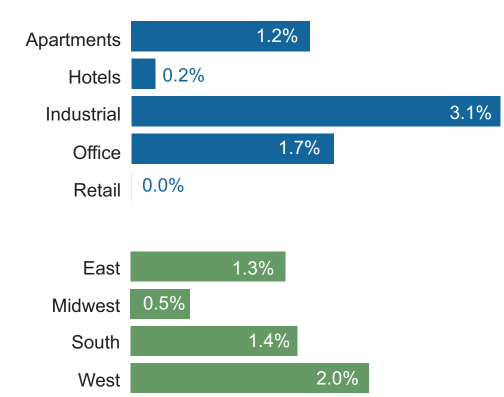
- Political uncertainty weighed on overall economic growth throughout Europe, but real estate fundamentals remain

Rolling One-Year Returns



Source: Callan

Sector Quarterly Returns by Property Type and Region



Source: NCREIF

strong in key gateway markets given strong demand and the continued lack of new supply. Cap rates for prime real estate remained low, as real estate continued to be attractive as a result of low interest rates throughout the region.

- Yields between prime and secondary real estate remained wide, providing opportunities for investors targeting transitional assets.

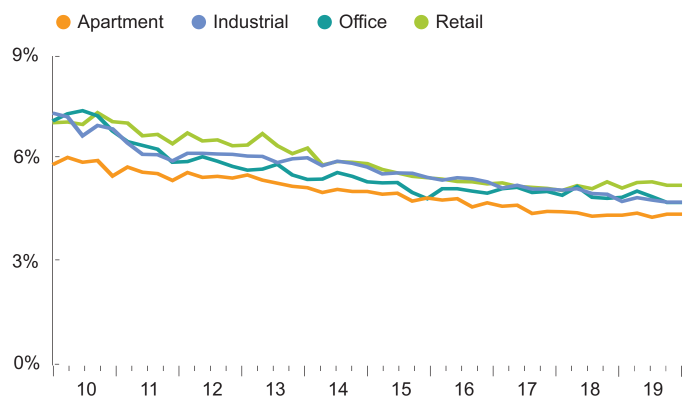
Infrastructure continues to mature

- Open end funds raised significant capital, and the universe of investible funds increased as the sector matured.
- The closed end fund market kept expanding, with additional offerings in infrastructure debt, emerging markets, and sector-specific areas (e.g., communications and renewables).
- Two mega funds raised in excess of $20 billion in 2019.

Real assets mostly see gains

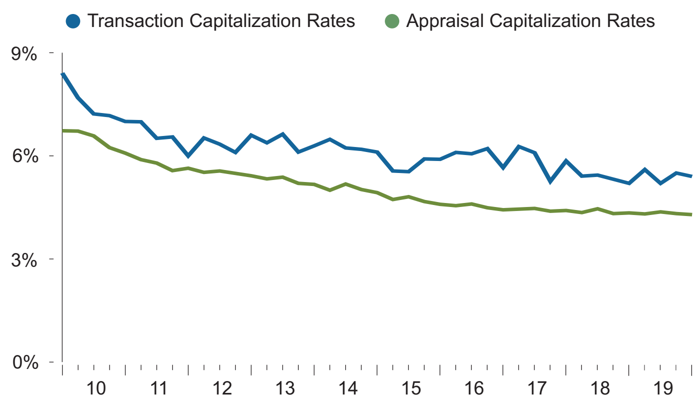
- Real assets returns were mostly strong in the fourth quarter. The **Bloomberg Commodity Index** gained 4.4% and the **S&P GSCI Commodity Index** was up 8.3%.
- MLPs, however, declined (**Alerian MLP Index:** -4.1%).
- Spot gold prices were up 3.4%.
- The **DJ-Brookfield Infrastructure Index** rose 4.0%.
- REITs (**FTSE Nareit Equity Index**) modestly fell (-0.8%).
- The **Bloomberg Barclays TIPS Index** rose 0.8%.
- For the year, returns of these indices were positive with Infrastructure (+28.7%) and REITs (+26.0%) leading the pack. MLPs (+6.6%) posted the lowest full-year return.

NCREIF Capitalization Rates by Property Type



Source: NCREIF. Capitalization rates (net operating income / current market value (or sale price)) are appraisal-based.

NCREIF Transaction and Appraisal Capitalization Rates



Source: NCREIF
Note: Transaction capitalization rate is equal weighted.

Callan Database Median and Index Returns* for Periods Ended 12/31/19

Private Real Assets	Quarter	Year to Date	Year	3 Years	5 Years	10 Years	15 Years
Real Estate ODCE Style	**1.6**	**5.8**	**5.8**	**6.8**	**8.4**	**10.5**	**6.8**
NFI-ODCE (value wt net)	1.3	4.4	4.4	6.1	8.0	10.4	6.7
NCREIF Property	1.5	6.4	6.4	6.7	8.2	10.2	8.3
NCREIF Farmland	1.0	3.4	3.4	5.4	6.7	10.9	13.3
NCREIF Timberland	0.0	1.3	1.3	2.7	3.1	4.4	6.6
Public Real Estate							
Global Real Estate Style	**2.8**	**24.9**	**24.9**	**10.3**	**7.2**	**9.9**	**7.2**
FTSE EPRA Nareit Developed	1.7	21.9	21.9	8.3	5.6	8.4	--
Global ex-U.S. Real Estate Style	**6.8**	**25.0**	**25.0**	**12.3**	**7.0**	**8.4**	**7.1**
FTSE EPRA Nareit Dev ex US	5.6	21.0	21.0	10.8	5.8	6.9	--
U.S. REIT Style	**0.0**	**28.3**	**28.3**	**9.2**	**7.9**	**12.6**	**8.6**
EPRA Nareit Equity REITs	-0.8	26.0	26.0	8.1	7.2	11.9	7.9

*Returns less than one year are not annualized.
Sources: Callan, FTSE Russell, NCREIF

Cheap and Dear

PRIVATE EQUITY | Gary Robertson

Global private equity fundraising has now surpassed 2007's famed peak of $615 billion for two years in a row, with $658 billion in 2018 and $692 billion in 2019 (unless otherwise noted, PitchBook provided all private equity data cited). Private equity market liquidity and transactions were brisk in 2019, albeit with moderate declines relative to 2018. Venture capital prices also increased year-over-year.

In 2019, the $692 billion raised by private equity partnerships holding final closes globally was across 924 partnerships. The dollar amount rose 5% from 2018, but the number of funds fell 1%. Fourth quarter final closes totaled $188 billion, down 11% from the third quarter. The number of funds totaled 255, up 9%.

New buyout investments for 2019 totaled 7,555, down 15% from 2018. Dollar volume fell 24% to $522 billion. The fourth quarter saw 1,642 new investments, a 17% decline, and dollar volume fell 13% to $137 billion.

The year produced 28,868 rounds of new investment in venture capital (VC) companies, down 12% from 2018. The year's announced volume of $257 billion was down 13%. The fourth quarter saw 5,301 new rounds, a 27% decline, and dollar volume fell 6% to $59 billion.

Last year also saw 2,054 buyout-backed private M&A exits, down 28% from 2018, with proceeds of $608 billion, down 13%. The fourth quarter had 420 private exits, down 23%, with proceeds of $154 billion, down 35%. The year's 95 buyout-backed IPOs declined 41% from 2018, with proceeds of $30 billion, down 32%. Fourth quarter buyout-backed IPOs were a bright spot, with 24 offerings, a jump of 41% from the third quarter, and $7 billion of proceeds, up 17%.

Venture-backed M&A exits for the year totaled 1,554, down 8% from 2018. Announced dollar volume of $122 billion was down 13%. The final quarter had 323 exits, down 19%, but announced value was up 22%. The year's 209 venture-backed IPOs fell 5% from 2018, with proceeds of $42 billion, down 9%. The fourth quarter had 61 VC-backed offerings, an 11% rise, but the $6 billion of proceeds dropped 33% from the third quarter.

Funds Closed 1/1/2019 to 12/31/2019

Strategy	No. of Funds	Amt ($mm)	Share
Venture Capital	412	74,014	11%
Growth Equity	66	80,931	12%
Buyouts	256	381,368	55%
Mezzanine Debt	67	76,986	11%
Distressed	11	15,823	2%
Energy	9	9,724	1%
Secondary and Other	59	37,854	5%
Fund-of-funds	44	15,663	2%
Totals	**924**	**692,363**	**100%**

Source: PitchBook (Figures may not total due to rounding.)

Private Equity Performance (%) (Pooled Horizon IRRs through 9/30/2019*)

Strategy	3 Months	Year	3 Years	5 Years	10 Years	15 Years	20 Years
All Venture	-0.37	13.01	14.56	14.39	14.83	11.41	11.02
Growth Equity	1.32	12.76	16.02	12.77	14.03	13.41	13.13
All Buyouts	1.43	8.85	15.32	12.83	14.59	13.65	12.04
Mezzanine	0.87	6.02	10.86	10.00	10.85	10.58	8.60
Credit Opportunities	-0.36	0.61	7.73	5.49	10.47	9.28	9.90
Control Distressed	1.05	4.38	8.86	7.83	11.17	10.52	10.58
All Private Equity	**0.92**	**9.59**	**14.41**	**12.33**	**14.03**	**12.72**	**11.72**
S&P 500	1.70	4.25	13.39	10.84	13.24	9.01	6.33

Note: Private equity returns are net of fees. Sources: Refinitiv/Cambridge and S&P Dow Jones Indices
*Most recent data available at time of publication

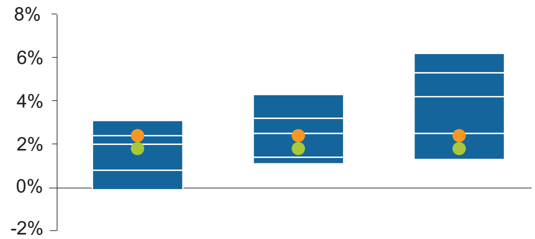
Note: Transaction count and dollar volume figures across all private equity measures are preliminary figures and are subject to update in subsequent versions of *Capital Market Review* and other Callan publications.

Party Like it's 1999 … or Not

HEDGE FUNDS/MACs | Jim McKee

- Hedge funds participated more cautiously in the fourth quarter risk-on market, as expected.
- Portfolios with exposure to EM and long-short equity fared much better than those emphasizing equity market neutral or macro strategies.
- In the fourth quarter, *Long/Short Equity* (+5.1%) rode the wave of market beta, but alpha was more sporadic, leaving little extra risk-adjusted return. Tech and health care were positive outliers.
- *Equity Market Neutral* (+1.1%) barely clawed back its recent September loss, with stocks lacking dispersion to create trading opportunities.
- *Managed Futures* fell 2.6% as bond rates reversed their downward trend, but it finished 2019 with a solid 9% gain.
- *Distressed* (+1.3%) continued to struggle with chronically weak credits like energy, finishing 2019 up 1.4%, making it the **Credit Suisse Hedge Fund Index's** weakest performer for the year, just below Equity Market Neutral (+1.6%).

Hedge Fund-of-Funds Style Group Returns



	Absolute Return	Core Diversified	Long/Short Equity
10th Percentile	3.1	4.3	6.2
25th Percentile	2.4	3.2	5.3
Median	2.0	2.5	4.2
75th Percentile	0.8	1.4	2.5
90th Percentile	-0.1	1.1	1.3
CS Hedge Fund ●	2.4	2.4	2.4
90-Day T-Bill +5% ●	1.7	1.7	1.7

Sources: Callan, Credit Suisse, and Federal Reserve

Callan Database Median and Index Returns* for Periods Ended 12/31/19

Hedge Fund Universe	Quarter	Year	3 Years	5 Years	10 Years	15 Years
Callan Fund-of-Funds Database	**2.69**	**7.10**	**4.32**	**3.08**	**4.49**	**4.49**
Callan Absolute Return FOF Style	**1.99**	**5.63**	**3.16**	**3.01**	**4.46**	**4.00**
Callan Core Diversified FOF Style	**2.47**	**6.70**	**3.59**	**2.41**	**4.25**	**4.16**
Callan Long/Short Equity FOF Style	**4.24**	**12.79**	**5.95**	**4.00**	**5.03**	**5.49**
Credit Suisse Hedge Fund	2.44	9.31	4.27	2.65	4.25	4.75
CS Convertible Arbitrage	3.34	8.15	3.54	3.59	4.17	3.90
CS Distressed	1.27	1.39	2.29	1.52	4.23	4.86
CS Emerging Markets	7.75	13.38	5.98	4.41	4.62	6.06
CS Equity Market Neutral	1.06	1.58	1.53	0.31	1.37	-0.58
CS Event-Driven Multi	2.66	11.42	3.79	1.11	3.17	4.73
CS Fixed Income Arb	2.29	6.10	4.54	3.69	5.44	3.80
CS Global Macro	0.75	10.38	4.04	3.16	4.73	6.18
CS Long/Short Equity	5.06	12.17	6.66	3.94	5.15	5.58
CS Managed Futures	-2.59	9.01	1.67	-0.61	1.56	2.63
CS Multi-Strategy	1.28	7.25	4.27	4.21	6.02	5.76
CS Risk Arbitrage	1.98	4.89	3.59	3.40	2.72	3.68
HFRI Asset Wtd Composite	2.32	7.57	4.45	3.21	4.46	--
90-Day T-Bill + 5%	1.67	7.28	6.67	6.07	5.58	6.39

*Gross of fees. Sources: Callan, Credit Suisse, Hedge Fund Research

Long Biased MACs rebounded; Risk Parity settled down

- MAC performance varied depending on net market exposures.
- Last quarter's 5.5% return of the 60% MSCI ACWI and 40% Bloomberg Aggregate benchmark was a tough hurdle to beat.
- *Long-Biased MACs* benefited from their typically heavy equity exposure, particularly EM.
- **HFR Risk Parity Index** targeting 10% volatility was moderately positive (+2.7%), reflecting strong stock gains partially offset by tepid bond returns.
- **Eurekahedge Multi-Factor Risk Premia Index** gained 3.7% based on solid returns from carry trades in risk-on markets offset by a reversal of last year's downward trend in yields.
- *Absolute Return MACs* edged ahead with their higher-quality asset bias amid the quarter's less discriminating risk-on market.

Volatility suppressed

- With the Fed lowering rates by another quarter point in the fourth quarter while rescuing repo funding markets with unprecedented cash infusions, the Fed openly served the punch bowl of liquidity for "risk on" investors.
- Equity volatility, as illustrated by VIX, continued to settle at below-average levels, indicating fewer trading opportunities for hedge funds.
- While last quarter's melt-up reflected increased comfort with today's easy monetary and fiscal policies, a revived trade war with China or another geopolitical conflict could quickly undo that market sentiment.

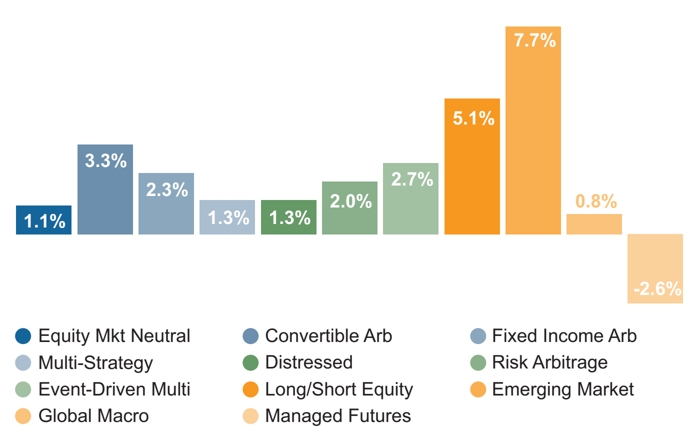
Falling cash returns remove any hint of a tailwind for hedge funds

- As short rates fell, dwindling cash returns and short interest rebates removed previously favorable trade winds from hedge fund sails.

Callan Institutional Hedge Fund Peer Group to launch

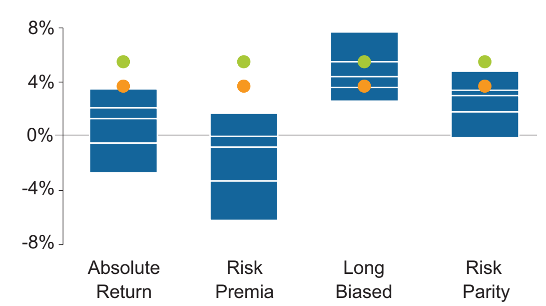
- To provide a more representative benchmark for our clients directly investing in hedge funds, Callan has created the Callan Institutional Hedge Fund Peer Group, a select collection of hedge funds meeting minimum size and other criteria that make them more attractive to institutional investors.

Credit Suisse Hedge Fund Strategy Returns



Source: Credit Suisse

MAC Style Group Returns



	Absolute Return	Risk Premia	Long Biased	Risk Parity
10th Percentile	3.5	1.7	7.7	4.8
25th Percentile	2.1	0.0	5.5	3.4
Median	1.3	-0.8	4.4	3.0
75th Percentile	-0.5	-3.3	3.6	1.8
90th Percentile	-2.7	-6.2	2.6	-0.1
Eurekahedge MFRP (5%v) ●	3.7	3.7	3.7	3.7
60% MSCI ACWI/ 40% BB Barclays Agg ●	5.5	5.5	5.5	5.5

Sources: Bloomberg Barclays, Callan, Eurekahedge, S&P Dow Jones Indices

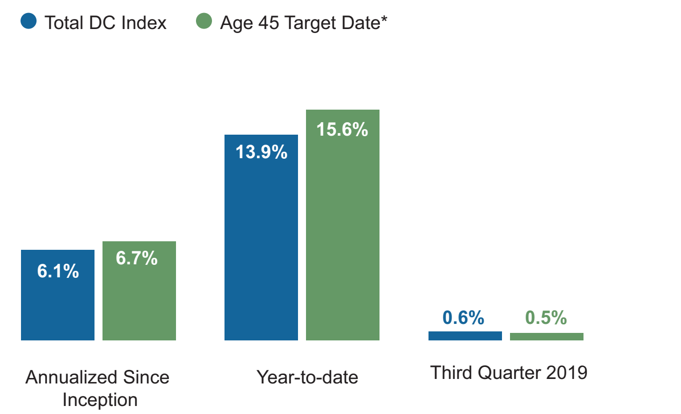
DC Index Gains Slightly but Tops Age 45 TDF

DEFINED CONTRIBUTION | Patrick Wisdom

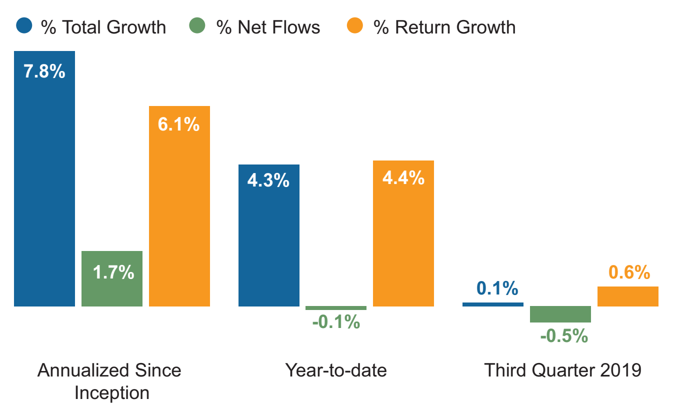
- The **Callan DC Index™** rose 0.6% in the third quarter after gains of 9.6% and 3.3% in the first and second quarters. The Age 45 Target Date Fund's smaller gain of 0.5% was largely due to its higher allocation to equity, which lagged fixed income during the quarter. The Age 45 TDF's bigger equity allocation, however, has contributed to a higher since-inception return (6.7% vs. 6.1%).
- The Index's growth in balances of 0.1% was much smaller than the first quarter (9.8%) and second quarter (3.3%).
- U.S. fixed income saw the largest inflows for the quarter (57.7%), for the first time since the third quarter of 2010. TDFs saw the second-largest inflow (26.2%), much lower than in recent quarters. U.S. large cap equity (-52.2%), and U.S. small/mid cap equity (-19.1%) had the largest outflows.
- Third-quarter turnover (i.e., net transfer activity levels within DC plans) decreased to 0.35% from the previous quarter's 0.54%.
- The allocation to equity within the Index fell to 69.5% from 70.0% in the previous quarter, after two quarters of increases.
- The percentage of assets allocated to U.S. fixed income increased by 0.5% to 6.3%. Similarly, the allocation to stable value increased by 0.3% to an overall allocation of 10.4%.
- TDFs experienced the largest decrease in asset allocation (-0.6%). With this decrease, 29.6% of assets were allocated to TDFs, the lowest since the first quarter of 2017.
- Stable value's prevalence within DC plans decreased for the first time in eight quarters and now sits at 76%, but still up nearly 3 percentage points from a year ago.
- Fees decreased across all plan sizes from the previous year, driven by a combination of increased adoption of passive mandates, as well as lower breakpoints and the use of less expensive vehicles and share classes for active options.

The Callan DC Index is an equally weighted index tracking the cash flows and performance of nearly 90 plans, representing more than one million DC participants and over $150 billion in assets. The Index is updated quarterly and is available on Callan's website, as is the quarterly DC Observer newsletter.

Investment Performance



Growth Sources



Net Cash Flow Analysis (Third Quarter 2019)
(Top Two and Bottom Two Asset Gatherers)

Asset Class	Flows as % of Total Net Flows
U.S. Fixed Income	57.73%
Target Date Funds	26.18%
U.S. Smid Cap	-19.09%
U.S. Large Cap	-52.23%
Total Turnover**	**0.35%**

Data provided here is the most recent available at time of publication.
Source: Callan DC Index
Note: DC Index inception date is January 2006.

* The Age 45 Fund transitioned from the average 2035 TDF to the 2040 TDF in June 2018.

** Total Index "turnover" measures the percentage of total invested assets (transfers only, excluding contributions and withdrawals) that moved between asset classes.

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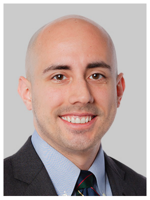

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The *Capital Market Review* is a quarterly macroeconomic indicator newsletter that provides thoughtful insights on the economy and recent performance in the equity, fixed income, alternatives, real estate, and other capital markets.

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About Callan

Callan was founded as an employee-owned investment consulting firm in 1973. Ever since, we have empowered institutional clients with creative, customized investment solutions that are backed by proprietary research, exclusive data, and ongoing education. Today, Callan advises on more than $2 trillion in total fund sponsor assets, which makes it among the largest independently owned investment consulting firms in the U.S. Callan uses a client-focused consulting model to serve pension and defined contribution plan sponsors, endowments, foundations, independent investment advisers, investment managers, and other asset owners. Callan has six offices throughout the U.S. For more information, please visit www.callan.com.

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The Callan Institute, established in 1980, is a source of continuing education for those in the institutional investment community. The Institute conducts conferences and workshops and provides published research, surveys, and newsletters. The Institute strives to present the most timely and relevant research and education available so our clients and our associates stay abreast of important trends in the investments industry.

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