INTEGRATED

EQUITY MARKETS HIGHLIGHTS

Legend: 4Q'2020 | YTD | 5 Year Annualized*

Chart data:
- U.S. LARGE STOCKS: 12.1%, 18.4%, 15.2%
- U.S. SMALL STOCKS: 31.4%, 20.0%, 13.3%
- INTERNATIONAL LARGE STOCKS: 15.7%, 5.4%, 4.6%
- EMERGING MKT STOCKS: 19.8%, 18.7%, 13.2%
- U.S. REITS: 7.7%, -5.3%, 6.7%
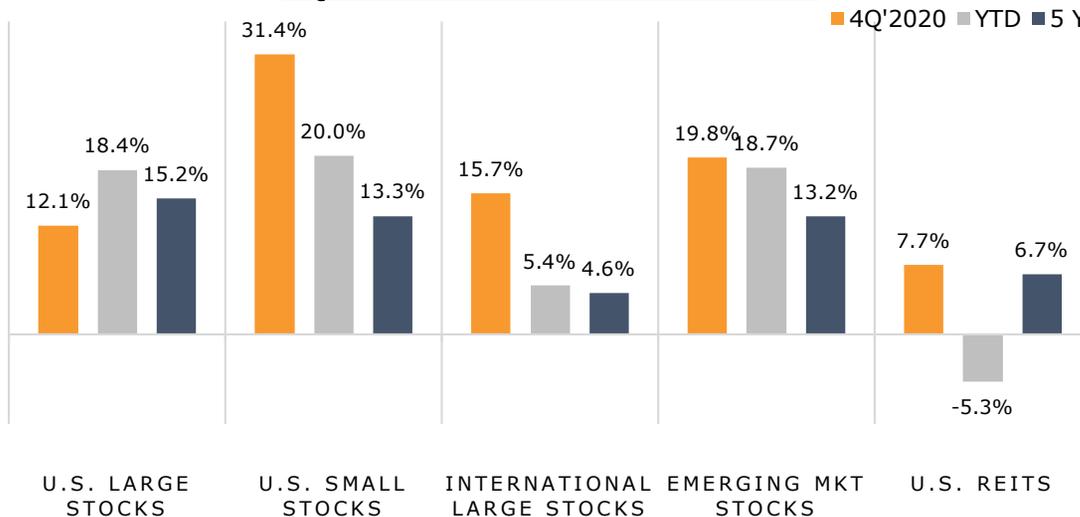
FIXED INCOME MARKETS HIGHLIGHTS

Chart data:
- U.S. MUNI BONDS: 1.8%, 5.2%, 3.9%
- U.S. TAXABLE BONDS: 0.7%, 7.5%, 4.4%
- U.S. HIGH YIELD: 6.5%, 7.1%, 8.6%
- GLOBAL BONDS: 3.3%, 9.2%, 4.8%
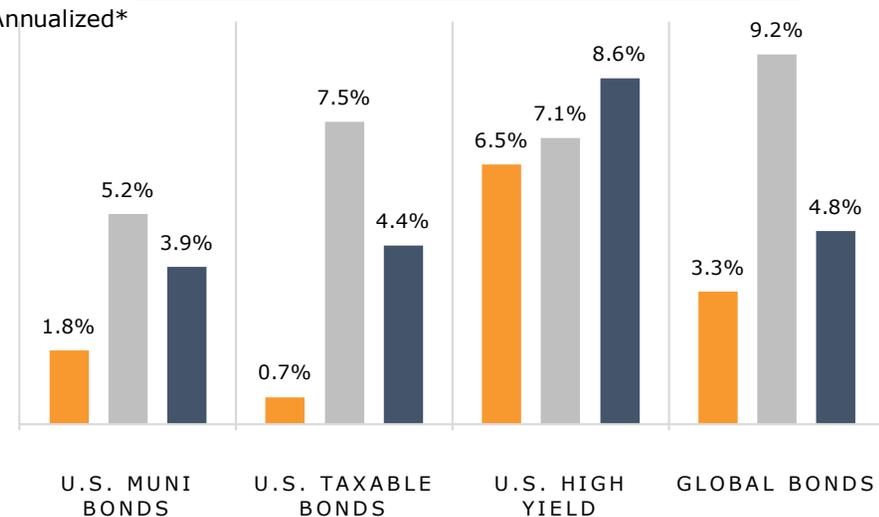
➤ **U.S. Large Stocks** saw heightened volatility around the 2020 election but still finished up +12.1% in Q4. Despite the gain, it was the second worst performing equity segment for Q4, trailed only by **U.S. REITs** which were up +7.7%. The energy sector led the cyclical recovery in Q4 and was the top performing sector for the first time in a long time.
  ▪ Valuations have the highest reading since the "dot com" bubble, with the S&P 500 trading at 34x both trailing earnings and cyclically-adjusted earnings.
➤ **U.S. Small Stocks** finished Q4 up +31.4%, the best quarter on record since the inception of the Russell 2000 in 1984. *This means that in 2020, the index had both its best and worst (1Q'20, down -30.6%) quarters ever in one calendar year!*
➤ U.S. dollar weakness boosted international stocks, with **Emerging Markets Stocks** leading the way, up +19.8%, while **International Large Stocks** were up +15.7%.

➤ Long-term interest rates moved higher with inflation expectations in Q4, which led the **U.S. Taxable Bonds** return to be comprised mostly of income, up +0.7%. The Municipal market also experienced unprecedented changes as GO financing was tied up with fiscal policy enacted to fight COVID. Even with macro risk, **U.S. Muni Bonds** historically have been one of the more stable fixed income segments, and with expectations for higher taxes, demand should remain high. For Q4, the tax-free segment outperformed taxable, up +1.8%.
➤ In a continued hunt for yield, fixed income investors have accepted higher credit risk, which aided in the returns in **U.S. High Yield**, up +6.5% in Q4.
➤ U.S. dollar weakness combined with lower rates in other major countries boosted **Global Bond** returns for Q4, up +3.3%.

2020 MARKET REVIEW

2020 likely will go down as one of the most unique years in market history. On the equity side, the year started with the *fastest bear market in history* in March due to the global impact of COVID, and then saw the *fastest bull market in history* when the market reached new highs just five months following the March 23rd bottom. This swift recovery was aided by the largest coordinated global health effort in history, as well as unprecedented global fiscal stimulus and crisis era monetary stimulus from global central banks. Technology stocks that provided immediate solutions to the widespread stay at home order benefited greatly and had a large divergence from "asset heavy" cyclical stocks. This tale of two markets didn't last long, however, as a COVID vaccine became reality, and the outcome of the 2020 elections led to forecasts for growing deficit spending. This aided in the meteoric rebound in cyclical stocks, as can be seen by the more than double-digit Q4 outperformance by more cyclical small stocks over large stocks. The fixed income markets experienced a volatile year as well. In March, expectations for a major credit event were high, and investors ran for safety with the Fed and other central banks signaling support for bond markets. U.S. *yields bottomed in August with the 10-year treasury reaching 0.52%,* but realization that the policy response to the pandemic would be inflationary saw the benchmark rate close 2020 at 0.93%. While inflation expectations have gone up since the pandemic, the Fed's revamped inflation target of "average inflation" allows wiggle room for inflation to run higher than 2% for longer.

Sector Snapshot	12/31/20
Sector	**QTD Return**
Energy	26.54%
Financials	22.48%
Industrials	15.03%
Materials	13.75%
Comm. Services	13.60%
Technology	11.41%
Consumer Cyclical	9.39%
Health Care	7.55%
Utilities	5.59%
Consumer Defensive	5.23%
Real Estate	3.66%

Equity Style Snapshot	12/31/20		
QTD	Value	Blend	Growth
Large	14.53%	12.79%	11.46%
Mid	18.14%	18.03%	17.92%
Small	29.31%	27.10%	24.65%

Market Indicators Snapshot as of 12/31/20

Name	Last Quarter	1 Mo. Ago	1 Mo. % Δ	1 Year Ago	1 Year % Δ	Data Freq.
Key Interest Rates:						
Effective Federal Funds	0.09%	0.09%	▲ 0.0%	1.55%	▼ -94.2%	Daily
2 Year Treasury	0.13%	0.16%	▼ -18.8%	1.58%	▼ -91.8%	Daily
10 Year Treasury	0.93%	0.84%	▲ 10.7%	1.92%	▼ -51.6%	Daily
30 Year Mortgage	2.67%	2.72%	▼ -1.8%	3.74%	▼ -28.6%	Weekly
US Corporate AAA	1.55%	1.55%	▲ 0.0%	2.55%	▼ -39.2%	Daily
US Corporate BBB	2.06%	2.15%	▼ -4.2%	3.19%	▼ -35.4%	Daily
US Corporate CCC	8.36%	9.56%	▼ -12.6%	11.78%	▼ -29.0%	Daily
U.S. Economy:						
Consumer Sentiment	80.70	76.90	▲ 4.9%	99.30	▼ -18.7%	Monthly
Unemployment Rate	6.70%	6.70%	▲ 0.0%	3.60%	▲ 86.1%	Monthly
Inflation Rate	1.36%	1.17%	▲ 16.0%	2.29%	▼ -40.4%	Monthly
Manufacturing PMI	60.50	57.50	▲ 5.2%	47.80	▲ 26.6%	Monthly
Non Manufacturing PMI	57.70	55.90	▲ 3.2%	54.90	▲ 5.1%	Monthly
Retail Sales	489,750	491,081	▼ -0.3%	460,767	▲ 6.3%	Monthly
Building Permits	1,709	1,635	▲ 4.5%	1,457	▲ 17.3%	Monthly

➢ The modern Western understanding of risk goes back 700-800 years ago with the formation of the Hindu-Arabic numbering system. It wasn't until the Renaissance period in Europe, however, until the study of risk became more prominent. In **1654** a French writer and gambler by the name of *Chevalier de Méré*, challenged famed French mathematician and philosopher *Blaise Pascal* to solve a puzzle on the proper way to divide the stakes of an unfinished game of chance between two players when one player was ahead. This puzzle had frustrated even the smartest of mathematicians for years, including 15th century Italian monk *Luca Pacioli*, the father of double-entry bookkeeping. To solve the puzzle, Pascal wrote his friend *Pierre de Fermat* for help and the two solved the problem based not on chance, but on expected value, which led to the discovery of the theory of probability.

➢ In the years following Pascal & Fermat's solving Pacioloi/de Méré's puzzle, probability theory transformed from something used for a gambling edge to a powerful instrument for interpreting complex information and risk management. In **1703**, Swiss mathematician *Jacob Bernoulli* invented the Law of Large Numbers and methods of statistical sampling after German mathematician and philosopher, *Gottfried von Liebniz,* commented to him "Nature has established patterns originating in the return of events, but only for the most part." The second clause in that sentence provides the answer as to why risk has always been in existence. Without the qualification "…but only for the most part.", every event would be predictable. Shortly after in **1730,** the concept of a normal distribution curve and standard deviation was first hypothesized by French mathematician *Abraham de Moivre* in his work on what we know today as Central Limit Theorem. The concept on using a normal distribution curve as approximation to Bernoulli's Law of Large Numbers became an essential component for how we quantify risk.

 ▪ Bernoulli's nephew, *Jacob Bernoulli*, offered a solution in **1738** to the St. Petersburg Paradox, a theoretical lottery game that leads to random variables with an infinite expected return. His solution to the paradox stands to this day as the building block for concepts on risk aversion, economic utility, and many other modern principles used in risk management.

➢ Almost a century after Pascal & Fermat's collaboration, an English minister named *Thomas Bayes* made a prominent discovery in statistics by demonstrating how better decisions could be made by mathematically blending new information into old information. What is now known as Bayes' Theorem solved the inference of a probability of a certain event, given a specific condition or conditions. Bayes' discovery was not published until after his death in **1763**.

➢ Almost every tool that is used today to identify, analyze, and/or protect against risk all came from the rapid developments in the 17th and 18th century as outlined above except for two major developments that happened in the following centuries.

 1. Regression to the mean was discovered by English mathematician *Francis Galton* (who was Charles Darwin's first cousin) in **1875.** When statements are made that something is "not normal", the notion of mean reversion is assumed. Galton was able to quantify this in his experiments on the size of the seeds of sequential generations of sweet peas.

 2. Diversification and its benefits were discovered with the introduction of Modern Portfolio Theory in **1952**, by economist and Nobel Laureate *Harry Markowitz.* While a graduate student at the University of Chicago, Markowitz demonstrated more efficient outcomes for portfolio selection through a mean-variance optimization model that provided the most efficient portfolio to maximize return for a given level of risk. Markowitz's founding of Modern Portfolio Theory revolutionized corporate finance and to this day still has a major impact on how risk is assessed at the corporate level globally.