MONONGAHELA CAPITAL MANAGEMENT

PERCEPTIONS

4th Quarter, December 31, 2021	12/31/2021	% Change 4th Quarter	% Change Year to date
Dow Jones Industrials	36,338.30	7.87 %*	20.95 %*
S & P 500	4,766.18	11.03 %*	28.71 %*
Russell 2000	2,245.31	2.14 %*	14.82 %*
BC Aggregate BD Index		0.01 %	(1.54) %
10 YR. Treasury Yield	1.51 %		
30 YR. Treasury Yield	1.90 %		

* *Includes reinvested dividend*

The View from Lagrange Point 2

On December 25th 2021, the James Webb Space Telescope (JWST) launched from Earth aboard an Ariane 5 rocket. After twenty-five years and $10 billion of development, this successor to the Hubble Space Telescope will travel almost one million miles to its observing point where it will peer into the farthest and faintest objects in the universe. The sensitive equipment on board has been designed, tested and adjusted many times over. As the pre-launch procedures were completed and the final countdown started, the thousands of men and women who worked on the project for decades surely felt a little nervous.

Many of us are familiar with the breathtaking images of galaxies, nebula, and other objects captured by the successful Hubble Telescope which launched in 1990 and has contributed to a number of major scientific breakthroughs. Orbiting in space, the Hubble has a few advantages over ground-based telescopes, most notably avoiding distortions from the Earth's atmosphere. This has allowed Hubble to capture images with unprecedented clarity and to see space in spectrums other than visible light such as ultraviolet and infrared. At 340 miles above Earth, the Hubble is also serviceable by astronauts, who have completed five such missions over the decades including the first one which corrected its primary mirror infamously built to the wrong specifications, an error not discovered until the first images were transmitted back to Earth.

As Hubble began collecting its first particles of light, astronomers had already begun working on plans for a successor. With mirrors kept at a stable temperature around 70°F, the Hubble was not optimized to capture infrared light – the light best suited to see the faintest and farthest objects of the universe. Capturing infrared light requires a telescope that is kept extremely cold. Even heat from the telescope itself could interfere with the sensitive equipment. The solution to this problem

was to send the future telescope far away – so far away in fact that the telescope would not be able to be fixed if something went wrong. The scientists began to plan accordingly.

930,000 miles away from Earth is a spot known as the Sun-Earth Lagrange Point 2 or L2. At this specific location in our solar system, the gravitational nuances of tugs and pulls from the sun and Earth will cause an object to keep up with Earth's orbit. This consistent orbit allows for a sunshield, built on the underside of a telescope and always pointed toward the sun, to preserve a stable -370°F temperature needed to capture infrared light on the other side. With a suitable destination identified, the scientists needed to design a telescope that could get there.

JWST's final size and shape prevented it from fitting into a rocket that would propel it to L2. This necessitated a design to fold into a capsule that would sit atop an Ariane 5 rocket. After launch, JWST will spend two harrowing weeks unfolding and another two weeks calibrating while traveling to L2. Notably, the tennis court-sized sunshield, consisting of five layers each the thickness of a human hair will unfold and the telescope's eighteen hexagonal mirrors with 126 small motors will align to form the primary mirror. In all, given a successful rocket launch, the JWST has 344 single points of potential failure – if any point goes wrong, the JWST won't work. Despite the decades of fastidious preparation, you can imagine the feeling of anxiety on launch day as uncertainty lay ahead.

Observation Platform

Like the JWST project, we have been working on our research platform for a long time, the better part of 42 years. Our observations, like the JWST, let us gather data to better comprehend the investment universe and perhaps add clarity to our outlook. The most important trends for us to identify are longer term, secular in nature. We have our own "Lagrange Point 2" in Harmony, Pa., a consistent orbit if you will, away from the short-term distractions and hyper trading now common in the investment community.

While the speculation in SPAC startups, cryptocurrencies, meme stocks, and hot IPO's makes for titillating headlines, the slow and laborious research process of price discovery lends itself to more disciplined investing. As we approach the two-year anniversary of the March 2020 lows, the underlying fundamentals of the economy remain fluid and dynamic. Factors such as rising Treasury yields, elevated inflation, corporate margin pressure, and disruptions to revenue streams are leading to heightened volatility and we suspect a decoupling of asset class performance. This decoupling can be noted in the wide performance variation in the Russell 2000 and the S & P 500 in the fourth quarter.

Perhaps the most significant change affecting the market since the pandemic began is a change in the Federal Reserve outlook. Chairman Jerome Powell has recently transitioned from an extraordinary accommodative and stimulating policy at the onset of the pandemic to policies that will now remove stimulus and eventually raise interest rates if the economy remains on its recovery trajectory. As we noted in our September 30th letter, "if interest rates rise over time towards historically normal levels, we would posit that there would be a corresponding multiple contraction, i.e. lower stock prices relative to earnings."

Value investing and price discovery research provides a discipline to minimize our reaction to the exaggerated push and pull of temporary outside influences, like abnormal Federal Reserve policy, a pandemic or an over caffeinated Robinhood trader. Our investment process establishes an intrinsic value for each security we own or are considering purchasing. Establishing the intrinsic value takes years of research, and then often years of patience until a security is priced at the proper discount for us to purchase.

As the James Webb Space Telescope nears Lagrange 2, we marvel at the extraordinary achievement of human ingenuity, hard work and persistence. Like the economy and markets, there were a myriad of setbacks and complex problems to solve, but in the end, an opportunity to advance hard science. We continue to search our universe for investment opportunities that help you achieve your long-term financial goals.