SMALL CAP CORE GROWTH

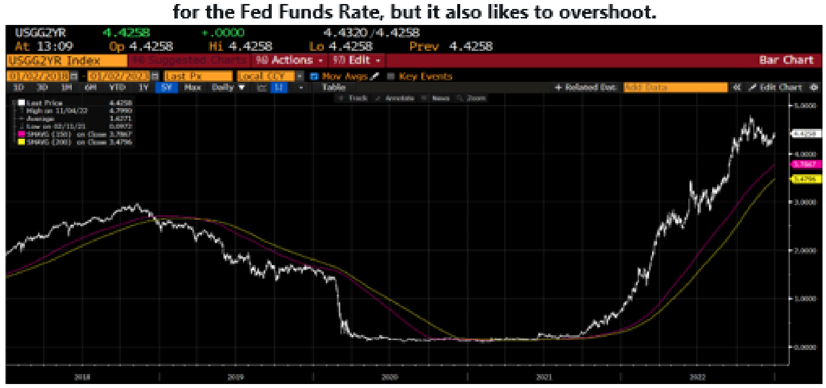
Portfolio Comments
December 31, 2022

Commentary

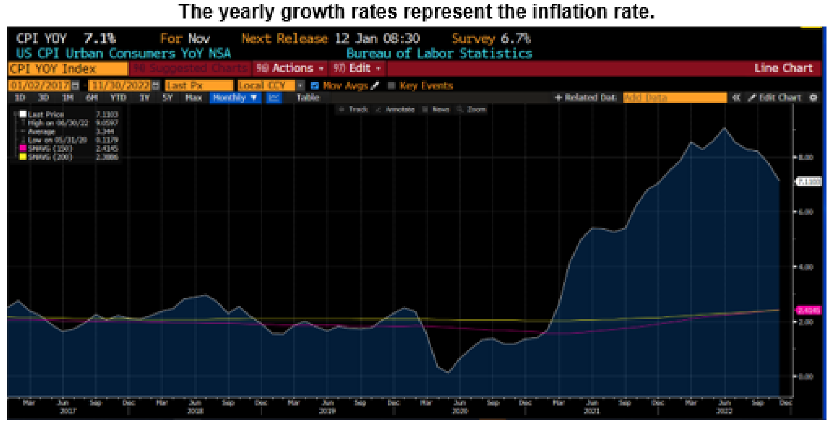
Brutal. Brutal is the only word that can describe the performance for small cap stocks in 2022. Granahan's Small Cap Core Growth portfolio was not spared the pain, as we underperformed for both the fourth quarter and full year 2022. Inflation proved to *not* be transitory, and the Fed's response to aggressively raise rates at a pace not seen in decades has crushed most asset classes. The charts below show how, over the last two years, interest rates have dramatically increased and how inflation has risen precipitously. The interest rate increases, as you can see, have started to reduce inflation. However, the effect of rising rates has negatively impacted the small cap growth universe. In the fourth quarter, the Granahan Investment Small Cap Core Growth strategy was down -1.8% versus the Russell 2000 Growth Index' positive return of 4.1%. For the year, Core Growth was down -36.1% versus the Index' negative performance of -26.4%.

Pundits talk about the fact that there was no place to hide from the market downturn. The worst names in our portfolio this quarter were from all three lifecycle categories. **Edgio** (Technology, Special Situation) is a content delivery company that has recently made strategic changes under a new CEO to move aggressively into the security and application development markets. Edgio's recent merger with EdgeCast created volatility among some customers that resulted in weaker than expected financial results. We expect Edgio to show improved results and profitability as its content delivery network (CDN) business gains scale, while the new software markets provide more attractive growth and profitability. We maintained our position during the quarter. **Silvergate** (Financials, Core Growth) is a bank focused on the digital currency market, providing 24/7 banking functions to market participants. The stock was weak in Q4 due to the widespread fallout in the digital currency market and expected near-term impact to financial results.

US 2-year yields rose significantly in 2022. The 2-year bond yield is a good leading indicator for the Fed Funds Rate, but it also likes to overshoot.



Consumer prices (CPI) are a measure of prices paid for consumer goods and services. The yearly growth rates represent the inflation rate.



Source: Bloomberg

There has been a constant barrage of rumors through social media that have pressured the stock to where it traded at almost 50% of its tangible book value at year-end. While the operating environment will certainly be more challenging this year, we believe Silvergate will emerge as the leading provider to institutional companies for digital currency-related services. We have added to our position. **908 Devices** (Healthcare, Pioneer) is a disruptive life sciences company focused on mass spectrometry that is used for chemical analysis. There is a strong long-term outlook as the company addresses two significant opportunities. The company's handheld device is showing strong adoption by police forces, helping combat the opioid crisis. There are also early signs of traction for the company's desktop device with large biotech and pharmaceutical companies, who leverage it for drug development and manufacturing. We are maintaining our position given confidence in the long-term growth potential for the company; however, the stock was under considerable pressure as the deteriorating economic environment delayed spending by many customers. **Fate Therapeutics** (Healthcare, Pioneer) is developing cell therapies for cancer. The stock fell out of favor as recent pipeline updates fell short of expectations while competition intensified. We have added to the position on weakness and expect improvements in 2023 on the strength of Fate's unique platform to drive long-term growth. **Kornit Digital** (Industrials, Core Growth) is a company that is transforming the textile printing industry. Product revenue has declined due to a push-out from Amazon along with slower ordering from e-commerce players. Kornit has expanded its portfolio of new products and the reach of its total available market. We believe Kornit is well-positioned competitively, and despite this year's revenue downfall, will return to at least 20% growth in the coming years. We are holding our position.

Despite the underperformance in the quarter, we did have several companies with strong results from our Pioneer and Core Growth categories. **Magnite** (Technology, Core Growth) is a company that provides a technology solution for automating the purchase and sale of digital advertising inventory. The stock has been under tremendous pressure due to a slowing growth rate. Results for the third quarter were strong, and the stock rebounded. We are holding our large position, as the stock has good growth prospects and a low valuation on a P/E basis. **Azenta** (Technology, Pioneer) provides sample-based services and solutions for the life sciences market worldwide. The company reported solid September year-end numbers after a disappointing previous quarter. Its healthy balance sheet, with just under $2.5B in proceeds from the sale of its semiconductor business, supports its announced $1.5B share repurchase program. Today, the company is trading at 2.1X EV/2023 sales versus the peer group median of 3.1X. We are maintaining our position. **Olink Holdings** (Healthcare, Pioneer) has emerged as the leading company in the high-plex segment of the proteomics market. Olink's technology enables scalable research in proteomics, a field that focuses on the role of proteins to better understand diseases. Proteomics builds on information gained from genomics to develop more targeted therapies to treat numerous diseases. Olink is expected to grow its revenue by 40% over the next couple of years. We trimmed our position given their strong relative performance, but it remains a top idea for this year. **Veracyte** (Healthcare, Pioneer) is a diagnostic company that provides actionable results to physicians and patients for many types of cancer. The tests leverage genomic information to improve treatment of lung cancer, thyroid cancer, prostate cancer, along with several other cancers. The company has executed well, including recently raising its outlook for 2023, despite some covid-related disruptions to cancer diagnoses. We maintain our position, as we believe the company's long-term outlook is compelling, and valuation is near historic lows. **Axon** (Industrial, Core Growth) is a mission-driven company which sells products, platforms, and services designed to improve law-enforcement efficiency, reduce social conflict, enable a fair and effective justice system, all while aspiring to use its Taser non-lethal weapon to "obsolete the bullet." Axon shares rose in the wake of very strong Q3 results and forward guidance. We are maintaining our position.

The largest detractors for the year included: **Kornit** (Industrials, Core Growth), **Digital Turbine** (Technology, Core Growth), **thredUP** (Consumer Discretionary, Pioneer), **Rapid7** (Technology, Pioneer) and **Porch Group** (Financials, Pioneer).

Our best performance this year came from **Array Technologies** (Energy, Core Growth), **WillScot Mobile Mini Holdings** (Industrials, Core Growth), **Enphase Energy** (Energy, Core Growth), **Evolent Health** (Healthcare, Special Situation) and **Texas Capital Bancshares** (Financials, Special Situation).

Attribution

Energy, Consumer Staples, Real Estate, and Basic Materials were the strongest performing sectors in the Index for the quarter. We are woefully underweight in these sectors. While stock selection in these sectors was solid, the portfolio's overweight in Healthcare and Technology detracted from performance. Stock selection in Biotechnology and Healthcare Devices negatively impacted the Healthcare sector, and the Software, Information Technology and Hardware industries were the culprits for underperformance in Technology.

For the year, our underweight in Industrials impacted performance the most. Technology's overweight and stock selection hurt as well. Our slight overweight in Health Care was a positive, but we were weighed down by our pioneering biotechnology stocks. Financials, Consumer Discretionary and Telecommunications were also penalties to performance. Strength in the portfolio came from our underweighted Energy and Basic Materials holdings which outperformed the Index handily. Our underweighting in Real Estate also helped performance.

Weightings

Our Pioneer weighting (33%) has slowly increased over the year as we added to the stocks that have been taken down the most. Special Situation stocks (18%, down from 23% last year) have largely been the source of cash. Core Growth is up slightly to 48% versus the 47% last year.

We have increased our overweight in Technology (from 33% to 36%), adding to positions that have been eviscerated while the Index weighting has declined (from 21% to 16%). We also are overweight in Healthcare, Financials and Telecommunications. Our largest underweights are in Industrials, Consumer Discretionary and Energy.

Themes

The primary factors plaguing small-cap growth stocks generally, and biotech stocks disproportionately, are oversupply and higher interest rates. The former is the result of an unprecedented multi-year run of IPOs driven by a robust funding environment, while the latter reflects dramatic policy shifts by the Fed recently to counter inflation. The net result of these dynamics is that there are more companies chasing less capital, and those that can secure it are paying much more for it. With that in mind, it's no wonder that small, cash-burning biotech companies are underperforming while the market adjusts to the reality of a more difficult funding environment. This backdrop makes for a much less forgiving environment. Management teams must make smart choices around which pipeline programs to fund, and how to drive programs to value-inflection points in an optimized manner. Most management teams are not up to this challenge, and many of the technologies and pipelines that yielded excitement are now viewed ambivalently as the market becomes more discerning. While this sorting out period is driving near-term pain in the portfolio, it's also creating opportunities for GIM to concentrate around our highest conviction names. Biopharma companies have been breaking new ground in previously untreated diseases, advancing new targeted cancer agents into clinical trials, and have continued to show the potential of novel modalities. While the strategy's focus on disruptive small-cap companies has always lent itself to higher risk tolerance, we do not invest in narratives. We perform deep-dive due diligence on portfolio candidates involving thorough technology, product, and market assessments, as well as several rounds of interviews with management. We continue this due diligence on an ongoing basis and seek to build positions in high conviction names opportunistically during periods of volatility like we are experiencing now. We believe our companies will outperform as the strong fundamental strengths (deep pipelines, cash-rich balance sheets and proven management) of our companies are recognized by investors. Names in the portfolios include **Blueprint Medicines**, **Immunogen**, **Veracyte** and **Olink**.

Environmental, Social and Governance (ESG) investing has attracted much attention as the EU deepens its commitment, while many in the US show skepticism over the benefits. At GIM, we believe that ESG factors can have an impact on the value of a company and the respective stock price. The consideration of ESG factors alongside traditional fundamental metrics provides us with a better understanding of the risk/return of potential sectors. Data on ESG factors for our small companies is frequently lacking. Therefore, our in-depth fundamental research is imperative to enable us to uncover and understand ESG considerations and integrate them into our investment process. The goal is to integrate ESG into our investment decisions consistent with our fiduciary duty to our clients. Many of the stocks in the portfolio are working to improve the world for future generations by creating products that pollute less, use less or greener energy sources and make the world a safer place. Companies in our portfolios include **Array, First Solar, Clean Energy, Shotspotter, Axon** and **Kornit**.

Macro

The economy has shown signs of slowing, with inflation easing from a summer peak. On the labor market front, initial jobless claims, the unemployment rate, and non-farm payrolls continue to look strong. The recent declines in job openings indicate that the labor market is adjusting, with the jobs-workers gap declining towards the level that may be necessary to prevent the labor market from overheating. US retail spending and manufacturing weakened in November and December. The Federal Reserve (Fed) raised its benchmark interest rate 0.5% to a 15-year high and signaled that it would continue lifting rates through the spring of 2023. Fed officials have increased rates at the fastest pace since the 1980's in an attempt to cool inflation. Many companies, and even individuals, are acting strategically - planning for a road ahead that may be more difficult to traverse, with higher interest rates, the housing slump, ongoing inflation, and the possibility of a recession.

Outlook

The strategy leverages our team of experienced portfolio managers who are also sector specialists. We remain committed to our process for finding great long-term growth opportunities by identifying companies early in their lifecycle with disruptive products addressing large markets. The value creation process for these types of companies plays out over years, making patience and opportunistic position-sizing key components of our investing process. Currently we are seeing valuation metrics for our portfolios that are at historic lows. Earnings estimates have come down, however, growth rates for our companies are expected to far outweigh that of the general economy.

While the portfolio's performance during the fourth quarter and year of 2022 was disappointing, we believe our process will yield relative outperformance on a multi-year basis. Against a backdrop of unprecedented moves in Treasury yields during the past few years, we are not in a position (nor have we ever been) to predict near-term market performance. We do however have much higher conviction that as we enter 2023, the risk-reward tradeoffs for our holdings are more attractive than they have been in years, affording us the opportunity to tilt the portfolio modestly toward names with value-creating catalysts on the near-term horizon.

As always, thank you for trusting Granahan with the management of your capital. It's invested alongside our own.