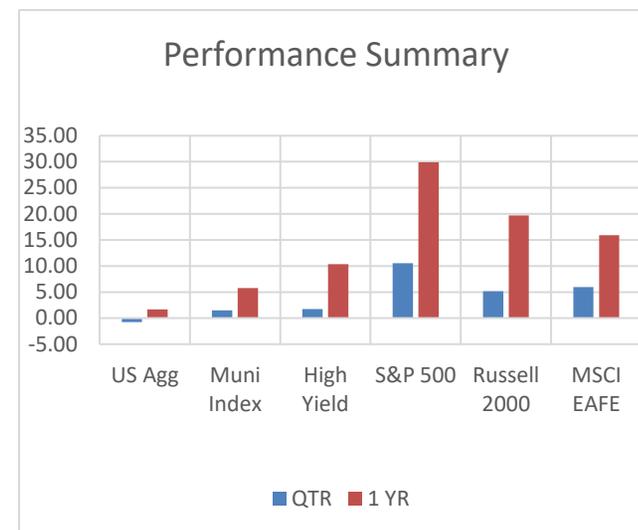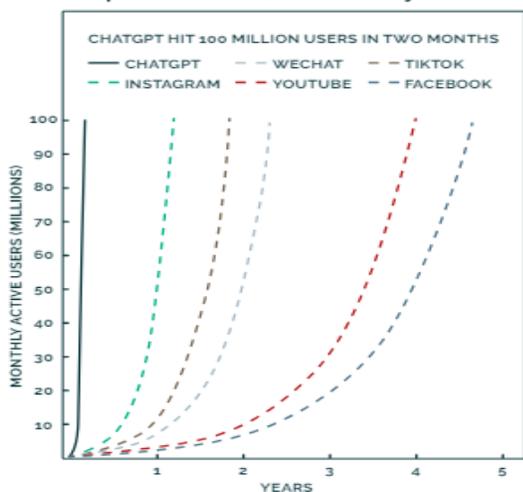Global stocks rallied in the first quarter, with U.S. stocks leading the way. Bonds were down slightly as the economy stayed relatively strong, inflation persisted and yields rose.

- The S&P 500 had its strongest gain since 2019 and was up more than 10% for the quarter. Small-cap stocks finished the quarter up 5.6%.
- Energy and communication service stocks were the quarter's top performers.
- Foreign developed market stocks were up close to 6% and emerging market stocks closed the quarter up 2.5%.
- The Federal Reserve held rates steady and continued to forecast three rate cuts in 2024. After climbing to 3.4% in December, the annual rate of U.S. headline inflation slowed to 3.2% by February.
- U.S. Treasury yields declined in March but rose for the quarter. The broad bond market was up for the month but declined a little for the full quarter.

Performance Summary

An Artificial Intelligence Update

Last year we sent a report that reviewed the key features of generative artificial intelligence (GAI), and its potential impact on the economy and investments. A lot has happened in the past year, so we wanted to update our research on the current state of the GAI industry. Below we share some of the latest GAI updates in the areas of adoption of the technology, the potential impact on the economy, and the phases of the investment cycle in GAI.

The rapid adoption of GAI technology is unprecedented.

Adoption Of GAI Is Extraordinarily Fast

CHATGPT HIT 100 MILLION USERS IN TWO MONTHS

SOURCE: ARK INVESTMENT MANAGEMENT LLC, 2024. BIG IDEAS 2024 REPORT. HTTPS://WWW.ARK-INVEST.COM/BIG-IDEAS-2024 NOTE: THIS ARK ANALYSIS IS BASED ON A RANGE OF DATA SOURCES, WHICH ARE AVAILABLE UPON REQUEST. FORECASTS ARE INHERENTLY LIMITED AND CANNOT BE RELIED UPON. FOR INFORMATIONAL PURPOSES ONLY AND SHOULD NOT BE CONSIDERED INVESTMENT ADVICE OR A RECOMMENDATION TO BUY, SELL, OR HOLD ANY PARTICULAR SECURITY. PAST PERFORMANCE IS NOT INDICATIVE OF FUTURE RESULTS.

Last year when ChatGPT was introduced it quickly garnered a hundred million users within the first few weeks of its existence. When we compare this to the adoption of other platforms, the growth in GAI has been unprecedented. The chart to the left shows how quickly platforms like Facebook, TikTok, and others took to reach the 100 million mark. In most cases, it took the other platforms years to reach 100 million users, while ChatGPT did it in weeks!

Since ChatGPT was rolled out we have seen a proliferation of other GAI platforms made available, including Google's Gemini, Perplexity AI, Mistral, Anthropic, and many more. Clearly, the race to develop GAI technology is on and spending on GAI technologies should accelerate rapidly. Forbes estimates that

total spending on GAI should exceed $200 billion by the end of 2024. We expect the adoption rate for consumers, corporations, and governments will continue at a very rapid pace in the years ahead.

The potential impact on the economy is vast, but estimates vary widely.

Similar to the emergence of other technologies the estimates for the potential impact on the economy vary greatly. In a recent report, the Bank Credit Analyst (BCA) aggregated some of the economic projections from leading firms. Below we have summarized some of those projections:

- According to Bank of America (BoA), the economic impact of AI is projected to be significant, with estimates suggesting that it will contribute over $15.7 trillion to the global economy by 2030. BoA also projects global revenue of $900 billion from AI software, hardware, services, and sales by 2026, a steep increase from $318 billion achieved in 2020.
- Goldman Sachs is also optimistic and projects that GAI will increase global GDP by 7%, which will amount to nearly $7 trillion over 10 years, and lift productivity growth by 1.5%.
- McKinsey pegs its estimates a bit lower: GAI will add between $2.6 trillion and $4.4 trillion in annual value to the global economy, increasing the economic impact of AI as a whole by 15% to 40%.
- IDC is more conservative and forecasts that GAI platforms and applications will generate revenue of $55.7 billion in 2027. AI Platforms will be the largest revenue category for most of the forecast period.

The above estimates of the economic impact shows there is a wide range of very optimistic estimates of the opportunity GAI presents. Some of the estimates may be exaggerated, but they all agree that this market is poised for strong growth and will be a significant driver of economic growth in the years ahead.

The phases of the GAI investment cycle

To understand the investment implications in the GAI industry it is helpful to have a framework for how spending will unfold in the years ahead. We have looked at several models from leading investment firms and found the approach used by BCA as the most intuitive and helpful. Basically, they break down the GAI industry into three areas: infrastructure companies, model and application companies, and early adopters. Here is a brief summary of each of these areas:

Infrastructure companies: these companies are considered the "picks and shovels" of the GAI industry and provide the infrastructure needed to build out GAI. Different areas include:
- **Computer chip designers and manufacturers** that provide the computing power for GAI to work. Examples include Nvidia, AMD, Intel, etc.

- **Cloud providers and platform companies** that operate large-scale data centers and provide cloud computing services to clients. Examples include Amazon, Microsoft, Google, Alibaba, etc.
- **Database and service providers** that organize the data and help make GAI work optimally. Examples include Oracle, Arista Networks, etc.
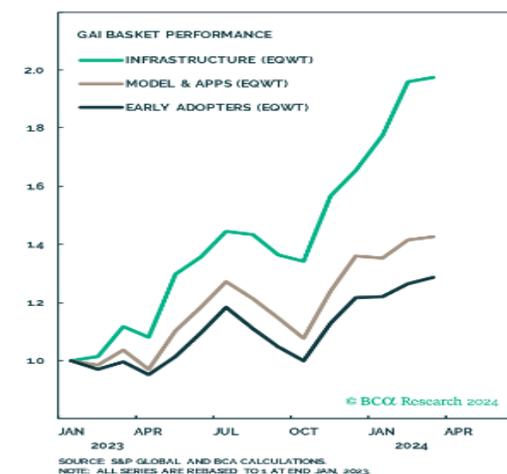
Models and Application Developers: This category includes the companies that build the GAI models (i.e. ChatGPT, Anthropic, etc.) and the companies that develop applications on top of the models. The application companies use the GAI models to provide solutions that enable companies to be more efficient, sell more goods, or provide better service. The list of applications is vast and includes some of the platform companies mentioned earlier (Amazon, Microsoft, Google, etc.) and many others.

Early adopters: these are companies that are investing heavily in GAI and integrating those capabilities into their core business models today. There are many examples in each industry, here are just a few.

- **Industrial companies:** Deere uses AI to improve farming practices. Honeywell uses GAI to optimize supply chains.
- **Healthcare:** GAI can be used in many different ways, examples include transcribing and summarizing medical notes, interpreting medical images, and answering consumer questions. Early adopters include United Health, Quest Diagnostics, and many others.
- There are early adopters of GAI in every industry and there are too many examples to list them all.

Infrastructure Companies Are At The Forefront Of The GAI Boom

In most technology booms, the phases of investment begins with the infrastructure stocks, transition to the models and applications developers, then ultimately the companies that successfully adopt the technology into their core business lead the way. The current GAI investment cycle is following this pattern. The chart to the right shows how a basket of GAI stocks in each area has performed to date, clearly the infrastructure stocks have led the way.

It is likely that the first phase of the GAI investment cycle, infrastructure stocks, is maturing and the transition to the next phases will begin to build momentum in the year(s) ahead. The next stage should benefit the companies building usable applications and services on top of the new GAI hardware that has been built out.

We will end our comments with a cautionary example from the 1990's technology boom. In 2000, Cisco was the leading internet infrastructure stock and became the most valuable company in the world. At the peak of the tech boom, Cisco traded at a very expensive 37 times its sales. Cisco continued to perform well as a company and increased its earnings over the next 20-plus years more than 10 times, however, its stock price is still more than 30% below where it was back in 2000! Expectations and valuation on the stock had

simply gotten too high for the stock to ever be a good performer. Currently, the leading GAI infrastructure company today, Nvidia, is trading at a similar 37 times its sales. It too is an amazing and dominant company today, and whether it will share a fate similar to Cisco is unknown at this point. However, it is a good time for investors to hedge their bets and look for the companies that will lead the next investment phase and are reasonably priced.
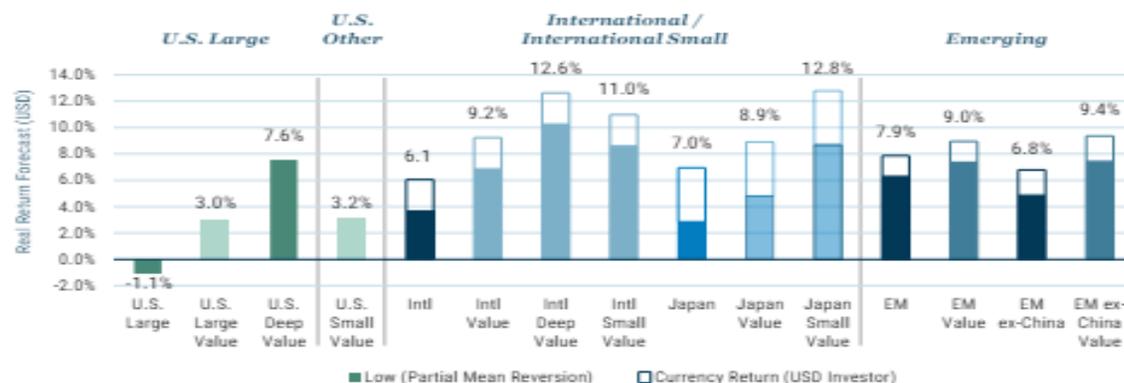
Markets are Pricey But Opportunities Abound

Even though stock market indices are at record highs, the asset allocation team at GMO recently stated they are seeing the best relative asset allocation opportunities they have seen in the past 35 years. Mainly due to an abundance of cheap assets within several asset classes. GMO estimates there are opportunities across stocks and bonds to generate high single-digit or double-digit returns above inflation over the next decade. The chart below highlights their expected real returns (excluding inflation) for the major asset classes and undervalued segments of the markets. The takeaway is that investors who focus on the undervalued segments of the stock market and foreign assets should be able to generate very good returns in the years ahead, and should not be dissuaded by the recent highs on the broad stock market indices.

We agree there are good investment opportunities ahead, but to capitalize on the opportunities investors will need to be disciplined, patient and focus on the segments with the most upside potential.

EXHIBIT 1: GMO EQUITY FORECASTS* (USD)
February 29, 2024 – Low Scenario
Source: GMO

Please give us a call if you have any questions about GAI and its impact on your portfolio or your portfolio strategy in general.

Best regards,

Steve Giacobbe, CFA, CFP®