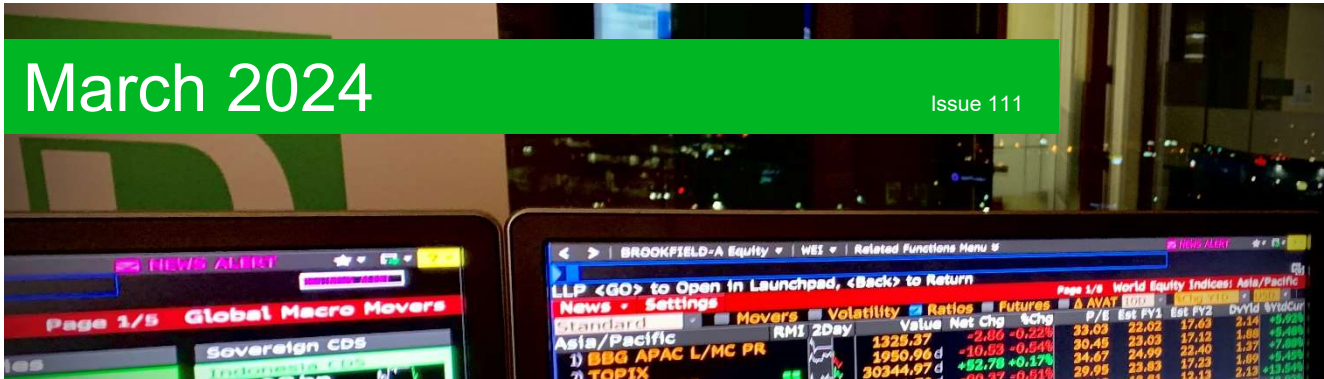


The Charter Group Monthly Letter

March 2024

Issue 111



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Economic & Market Update

AI, AI, ... Oh.

Beginning in November 2022, the press became enamoured with the public's sudden fascination with artificial intelligence (AI). Stories about the ability to generate lengthy compositions based on a simple inquiry conjured up notions of students instantly creating term papers and journalists lazily relying on AI to write their columns.

In the U.S., the Nasdaq and the S&P 500 Indices began to climb upwards on the excitement of AI despite the fact that the U.S. Federal Reserve was still in the process of hiking interest rates to combat inflation. The exact nature of what AI would look like and exactly how it would impact our daily lives at home and at work were not really defined. Instead, words like "transformative", "revolutionary", "game changer", and "tipping point" have been bandied about. And, rather than waiting for concrete definitions, the markets decided to assume that the economic payoffs would be enormous and began to price the various stocks associated with AI to reflect the hoped-for massive profits somewhere down the road. The prevailing narrative is that this iteration of AI would surpass things like the world wide web or the smartphone in terms of economic consequences.

Investors are embracing the idea that AI will lead to massive changes in our daily lives and will present historical opportunities to make huge profits.

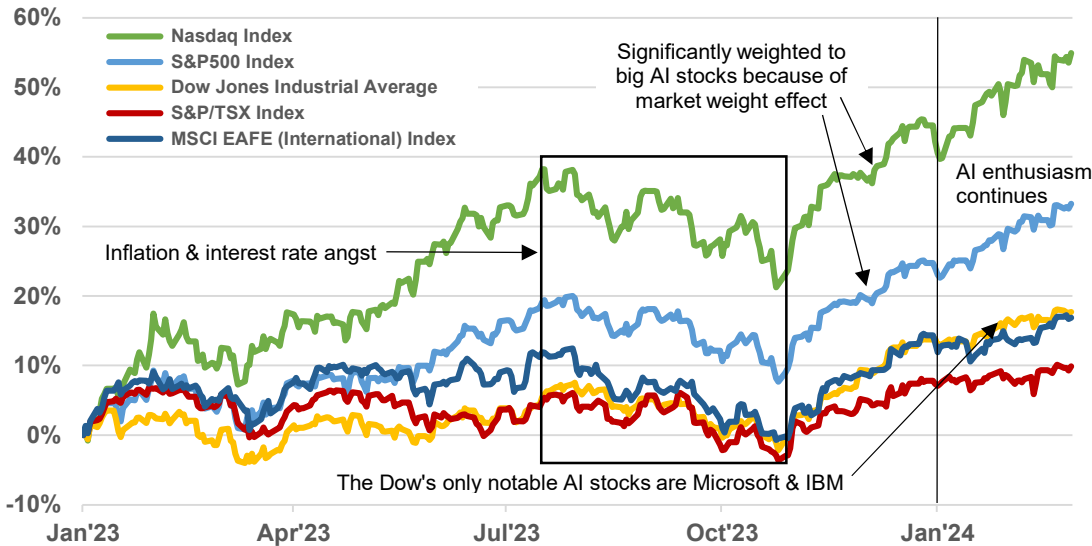
Have investors gotten ahead of themselves?



As I wrote in this space back in June, the investment market impact of AI had been significant.¹ That has carried through to today as investors in the largest AI-related companies have ignored the concern that we might not be getting interest rate cuts as soon as forecasters had hoped (Chart 1).

AI has helped to lift markets, especially those indices that have a higher AI representation.

**Chart 1:
Stock Market Indices Since January 1, 2023**



Source: Bloomberg Finance L.P. as of March 1, 2024

It is a virtual certainty that AI will have a net positive economic impact. That is not the debate. Rather, the debate is about the *size* of the impact.

AI will have a net positive economic impact. The question is: How much?

If one would take all the AI cheerleaders at their word, the stock market valuations might make sense.² But, that appears to me to reflect the most rosy of scenarios. Besides, weren't we supposed to have nuclear fusion and fully-autonomous vehicles by now?

AI has been a recurring theme throughout my 35-year career in the investment industry. What sets November 2022 apart from all the previous developments is an app that anyone can use to generate a response to a query. Suddenly, there was a reference point that we could essentially touch and feel.

Chatbots, that everyone can use, have changed the way that the public perceives AI.

To be specific, a company named Open AI launched ChatGPT that November. The launch coincided with some press coverage focusing on Microsoft's investment in Open

¹ Mark Jasayko, "The Magnificent Seven", *The Charter Group Monthly Letter*, Issue 102, June 2023.

² During an earnings call on February 22, 2024, the CEO of Nvidia, Jensen Huang, declared that AI was at a "tipping point." However, before taking this prognostication at full value, it should be noted that he has been prone to hyperbole over much of the last two decades.

AI. ChatGPT is a type of AI where one enters a query and, within seconds, sees lines of output being generated. ChatGPT scans enormous swathes of the internet and then applies some heavy-duty processing to produce the result.

It's amazing for sure. But the output normally falls well short of what we might demand in terms of quality, reasoning, and thoroughness. In many cases, ChatGPT will even provide totally incorrect answers.³ The hope is that this will be substantially improved over time.

What November 2022 signalled was not a breakthrough in AI. Instead, it was an indication that processing power had reached a level that made this type of AI possible. It was a combination of using graphics processing units (or GPUs, made primarily by Nvidia) and the investments that have been made in hyper-scaled data centres (or massive "server farms") over the last two decades. The primary impetus for these data centres was to provide cloud computing services to businesses and consumers. And, eventually they were identified as ideal for the type of AI behind an app like ChatGPT.⁴

Does this justify the adding of trillions of dollars of market capitalization to the shares of companies that claim a connection to AI? In many cases, the mere mention of AI by a company's management, regardless of how vague, has been enough to attract investors to buy the shares.

I would guess that much of the hyperbole I have heard is an attempt at justification. Apart from a few very obvious beneficiaries of the potential for corporate spending in this area (companies like Nvidia and Microsoft who provide the "tools and the plumbing"), it could be extremely challenging to be confident that most of the companies will be able to monetize their involvement in AI (ie: getting people to pay for it in a sizable way).

Things like the personal computer, the internet browser, and the smartphone were all clearly transformative. With these, it was almost instantly evident that things had changed. There was no need for advocates to give us a hard sell (like there has been with the possible applications of bitcoin for example, which is now over 15 years old).

The jury is still out with respect to the extent that AI will be able to make a big difference

³ I have been able to get ChatGPT to generate wrong answers to fairly basic math questions. That said, I did notice that days later it would get the correct answer, so there appears to be an element of learning. However, I have no idea whether it learned because of my initial query, or if the learning just happened coincidentally between my initial query and my eventual follow up query.

⁴ Microsoft is the second largest provider of cloud computing services in the world. As a result, it has lots of these data centres. That might have been one of the reasons to fund the creation of something like ChatGPT which is able to take advantage of Microsoft's data centre scale.

The chatbot-type of AI is more about processing power than it is about generating reliable results.

Equating chatbot-type AI to the technological breakthroughs of the last half century feels premature to me.

in our lives anytime soon. Plus, some very notable issues still need to be resolved.

About eight years ago, Microsoft launched a chatbot which was named Tay. Twitter was used as the platform where people could interact with Tay. However, it had to be shut down after a couple of days because of some of Tay's extremely shocking responses.

One would think that AI providers would have learned from this lesson of prematurely launching before testing things out. However, just in the last week, Google had to apologize for some of the results generated from its recently launched chatbot, Gemini.

Perhaps these things can't be tested effectively before going live where millions of users will then push the platform to the limit. Or, maybe it is just not economically feasible to manage this in realtime to avoid embarrassments. How might it affect a company's reputation where they have committed to a chatbot service for customers and then the chatbot goes rogue?

Recently, Air Canada's chatbot offered a \$600 refund to a client. A court ruled that Air Canada was liable for the actions of the chatbot.⁵ Thankfully this was only a monetary issue. But, what if a company's chatbot starts engaging in controversial political or social topics?

The other notable issue that is emerging is the power consumption of this type of AI. It was estimated that if all the users of Google's search page used Google's Gemini chatbot instead to do searches, it would require the additional energy equal to the entire output of a country like Ireland!⁶ Not good news in this age of climate awareness.

I would expect that improvements in AI will help companies to operate more efficiently in the future and to add some incremental productivity gains. If managed competently, this could very well increase profitability.

But, the market is likely pricing in an acceleration towards things that we might see in science fiction. Imagination is a powerful thing. However, I think it's reasonable to assume that AI-related equity investors are eventually going to demand evidence of that progress.



⁵ Kyle Melnick, "Air Canada chatbot promised a discount. Now the airline has to pay it." *The Washington Post*, February 18, 2024.

⁶ Ellis Stewart, "Google's AI Could Eat as Much Energy as Ireland, Experts Warn." *Enterprise Management* 360, December 10, 2023.

Very controversial results from AI have been an on-going issue for years. Recent issues suggest not enough progress have been made on these serious problems.

Will companies risk their reputations if fully committing to AI can get them embroiled in controversial subjects and debates?

The eye-watering power consumption of chatbot-type AI platforms has not been adequately addressed.

I would expect that investors will eventually demand answers in order to validate their enthusiasm.

Model Portfolio Update⁷

The Charter Group Balanced Portfolio (A Pension-Style Portfolio)		
	Target Allocation %	Change
Equities:		
Canadian Equities	12.0	None
U.S. Equities	38.0	None
International Equities	8.0	None
Fixed Income:		
Canadian Bonds	22.0	None
U.S. Bonds	6.0	None
Alternative Investments:		
Gold	8.0	None
Silver	1.0	None
Commodities & Agriculture	3.0	None
Cash	2.0	None

The asset allocations and the individual investments in the model portfolios remained unchanged in February.

The AI enthusiasm continued to lift markets, especially the U.S. indices that have a heavy weighting to the companies most associated with it (see above section). Plus, all of this appears to have added to the general level of optimism resulting from the fact that the economy has been able to avoid the recession that has been forecasted by a number of prominent economists over the last two years (this ignores that much of the economic resilience is the continuing government fiscal largesse, but that's another story).

However, it is that strength in the economy that may eventually and, paradoxically, create a headwind for the markets. Since last summer, there has been hope that the economy would slow just enough to allow central banks to begin cutting the interest rates that they previously hiked because of inflation. Now, there is growing consternation that those interest rate cuts are going to be notably later and less in magnitude than what was

No changes to the model portfolios during February.

As discussed above, AI is still lifting U.S. markets.

Economic resilience is also providing some tailwind.

But, that economic resilience might delay the interest rate cuts that investors were hoping for.

⁷ The asset allocation represents the current *target* asset allocation of the Balanced Model Portfolio as of March 1, 2024. The asset allocations of individual clients invested in this Portfolio may differ because of the relative performance of the asset classes since the last rebalancing and because of differences in the timing of deposits and withdrawals. The Balanced Model Portfolio is part of a sequence of five portfolios ranging from conservative to aggressive: Conservative, Balanced Income, Balanced, Balanced Growth, and Growth.

expected. Also, there is a growing chorus of commentators chiming in with forecasts that include no interest rate cuts in 2024, and even "meaningful" probabilities that the next move might be a hike instead of a cut!^{8 9}

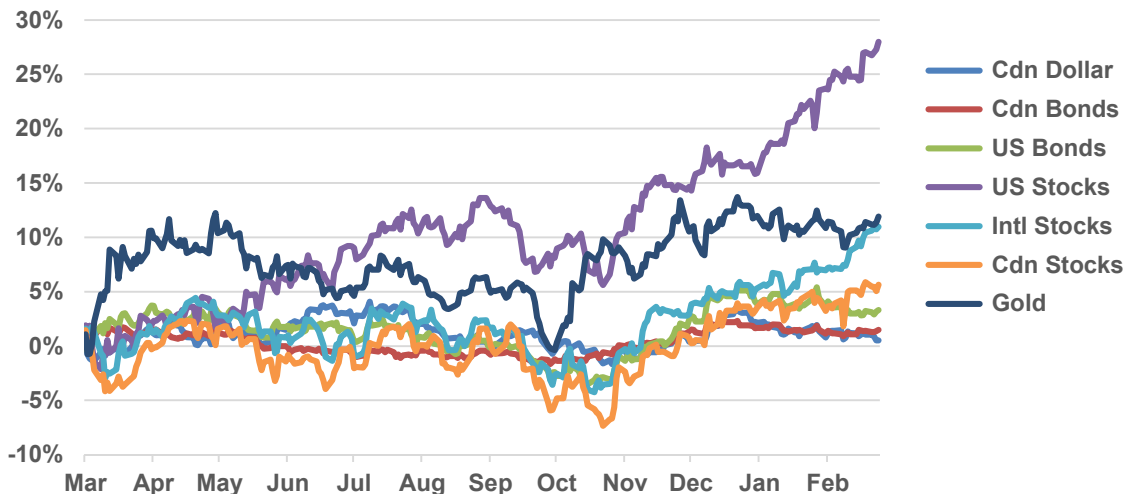
The bond markets may be signaling some concern about this as they were generally negative for the month of February. The stock and bond markets are on opposite sides of an argument. At some point, one market should yield to the other.

Seasonally, stock markets have historically risen through to May, so that could be a time when investors reassess and decide if the gains in AI are sustainable, if the economy is resilient or not, and if inflation factors have subsided enough to provide scope for interest rates to decline. By mid-Spring, we could see a spike in volatility as the debate intensifies, especially in areas of the market that have been the benefactors of recent investor passion.

Historically, stock markets tend to do well up to the beginning of May. At that point, we could see volatility as investors ponder valuations as well as the direction of the economy, interest rates, and inflation.

Below is the 12-month performance of the asset classes that we have used in the construction of The Charter Group's model portfolios. (Chart 2).¹⁰

**Chart 2:
12-Month Performance of the Asset Classes (in Canadian dollars)**



Source: Bloomberg Finance L.P. for the interval from March 1, 2023 to February 29, 2024

⁸ Carter Johnson, "Apollo's Torsten Slok Says Fed Will Not Cut Rates in 2024." Bloomberg News, March 1, 2024.

⁹ Chris Anstey, "Summers Sees 'Meaningful Chance' Next Fed Move Will Be a Hike." Bloomberg News, February 16, 2024.

¹⁰ Source: Bloomberg Finance L.P. – The Canadian dollar rate is the CAD/USD cross rate which is the amount of Canadian dollars per one U.S. dollar; Canadian bonds are represented by the current 3-year Government of Canada Bond; US bonds are represented by Barclays US Aggregate Bond Index; U.S. stocks are represented by the S&P 500 Index; International stocks are represented by the MSCI EAFE Index; Canadian stocks are represented by the S&P/TSX 60 Composite Index; Gold is represented by the Gold to US Dollar spot price.

Top Investment Issues¹¹

Issue	Importance	Potential Impact
1. Global Geopolitics	Significant	Negative
2. Canadian Federal Industrial Policy	Moderate	Negative
5. Inflation (Portfolio Impact)	Moderate	Positive
3. China's Economic Growth	Moderate	Negative
4. Canadian Dollar Decline	Moderate	Positive
7. Short-term U.S. Interest Rates	Medium	Negative
6. U.S. Fiscal Spending Stimulus	Medium	Positive
8. Long-term U.S. Interest Rates	Medium	Negative
9. Global Trade Wars	Medium	Negative
10. Canada's Economic Growth	Light	Positive

¹¹ This is a list of the issues that we currently deem to be the ten most important with respect to the potential impact on our model portfolios over the next 12 months. This is only a ranking of importance and potential impact and *not* an explicit forecast. The list is to illustrate where our attention is focused at the present time. If you would like an in-depth discussion as to the potential magnitude and direction of the issues potentially affecting the model portfolios, I encourage you to email me at mark.jasayko@td.com or call me directly on my mobile at 778-995-8872.

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Accountability is further enhanced by the fact that we commit our own investable wealth to the same model portfolios in which our clients are invested.





The information contained herein is current as of March 1, 2024.

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