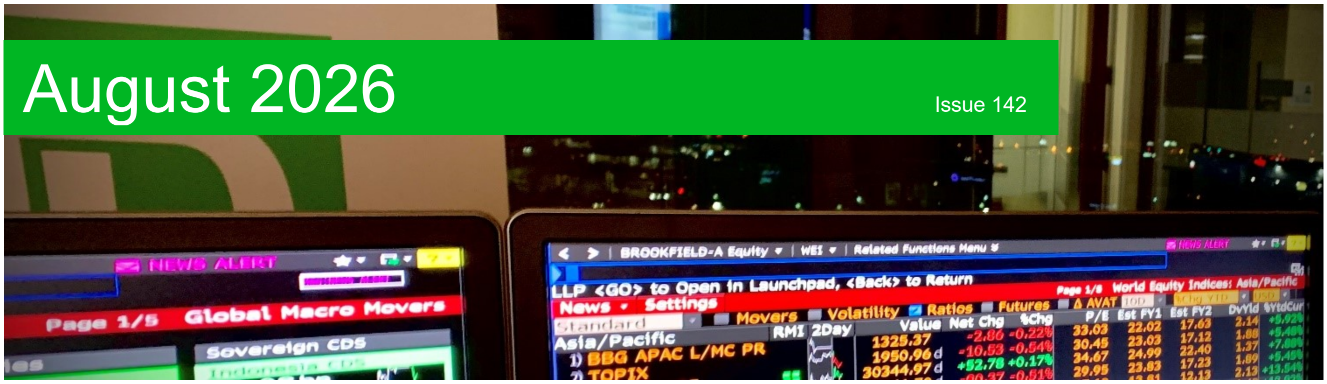
The Charter Group Monthly Letter



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Economic & Market Update

Mars Math

Starting a colony on Mars was one of the goals outlined in SpaceX's recent prospectus. Assuming the planet will be colonized with humans (as opposed to robots), this might be a good time to look at the math of merely getting a human there. I am going to keep it simple, looking at the really big things that need to line up for this to happen.

Often the expectations of technological achievements are pushed out well beyond their original timeline.

Will the expectations of landing humans on Mars also be subject timeline revisions?

This could provide some insight into the timeline (which has been stretched out dramatically in many of the Elon Musk-related endeavors like robot butlers, true Level 5 self-driving, or humans flying on a SpaceX Starship). Eventually, time is relevant. For example, it wouldn't make much sense for investors to put a value on something that was well beyond their lifetime.

The first hurdle is getting Starship (SpaceX's super heavy-lift rocket[1]) rated for human flight. Right now, most of the early estimates suggest this could be 2028. Up until now, many of the launches have ended in spectacular failure. And the launches that have led to success in terms of engineering advancements have not included life support systems.

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[1] The definition of a super heavy-lift rocket is one than can transport a payload of 50 metric tons, or 110,000 pounds, into Earth orbit.

Also, there have only ever been two super heavy-lifters to be human rated: the Saturn V and the Space Launch System (SLS). The Saturn V involved years of testing before its maiden flight in November 1967. It was more than another year before its first manned flight in December 1968. That testing apparently paid off as there were no launch failures in any of its 13 flights. If you include the other Saturn variants, there weren't any launch failures over 32 flights. This was the kind of track record needed to feel comfortable enough to place astronauts on top of the rocket.

The larger the rocket and the longer the distance, the more complicated things get.

This can add to testing and delays.

The SLS went through years of testing as well (but without the urgency of the 1960's space race). Its maiden voyage was in November 2022. Its first manned flight was this April (with Canadian Jeremy Hansen aboard).

The Soviet's super heavy-lifter, the N1, was the downfall of its lunar program. Its four launches, none carrying cosmonauts, all ended in catastrophic failure. And, despite the extensive history of its space program and its lunar landing aspirations, China has never had a super heavy-lifter. Its hopes are for the Long March 9 and Long March 10 rockets to be operational by the end of the decade.

The Soviet Union and China have never had human-rated super heavy-lift rockets despite having space programs that go back decades.

All of this points to how hard it is to develop super heavy-lifters regardless of the success of smaller rockets. As the scale increases, the complications appear to increase at a much faster rate. So, do I think it is optimistic for SpaceX's Starship to be human rated by 2028? Yes. So, let's say it's human rated by 2030.

SpaceX's success with their smaller Falcon rockets doesn't translate into quick success with the much larger Starship rocket.

Will it be astronauts to Mars in 2030 then? I would still say no. It would be surprising to see a mission without some trial runs. Apollo astronauts flew twice to the moon without landing before Apollo 11 touched down. Much was learned on these trips as they were the first beyond low Earth orbit. Michael Collins, the command module pilot on Apollo 11 referred to a "daisy chain" of events where so many things had to be done in a specific sequence and had to go right in order to move to the next stage ofthe mission. The earlier flights near the moon provided a real world testing that was cruicial for Apollo 11.

In addition to certifying a big rocket, the number of things that need to go right for a Mars mission adds to the need for training and testing, potentially much more than the Apollo program.

Mars requires a much more ambitious daisy chain, including an orbital transfer of fuel from a series of tanker Starships to the Starship that will actually make the Martian journey.

One entanglement that might delay all this is the U.S. government's recommitment the moon. SpaceX likely wants the funding that will be made available for this and looks like they will participate in establishing a lunar base. They can do two things at once, but I think it would be hard to push the Mars mission at full velocity when also directing

Funding and competing with a concurrent lunar program might also cause delays.

resources towards an elaborate moon project. There may be some useful things learned, but Mars is on a whole different level in terms of complexity and risk.

Apart from all this are launch windows for Mars. The launch windows to the moon are almost continuous (for Apollo it was about once per month, but this was to match up the landings closer to full moons as the astronauts needed to walk on the side of the moon facing earth for communication while also needing sunlight to illuminate things).[2]

Limited launch windows reduce the opportunities and can add more time.

Launch windows to Mars are much rarer as the priority is to use Earth's inside lane orbit to whip the spacecraft out and then basically have Mars slowly catch up to it. This optimal planetary alignment occurs roughly once every 26 months. Even if Starship is able to do a more direct approach to cut travel time,[3] Earth and Mars still need to be near each other which won't increase the number of windows and could even tighten the window. The next window is this November. I think it is safe to say that we can forget that one.

An initial unmanned mission by 2031? Possibly.

The next windo is late December 2028. It is conceivable that SpaceX sends an unmanned Starship to Mars here. It would generate huge excitement and receive massive news coverage (free PR which Musk is great at). But I really have doubts if this would be something that resembles a realistic trial run for a human mission. And I don't think the odds are very good for a successful round trip. Just an upright Martian landing of a Starship would be a huge achievement. However, concievable doesn't necessarily mean likely. Especially with the concurrent lunar missions. So, let's give this mission the February 2031 launch window to provide some buffer time.

A full unmanned dress rehearsal mission by 2035? Maybe.

A realistic unmanned round-trip trial mission that tests all the systems including life support won't be cheap and may test SpaceX's ability to fund it. Will government funding be available around this time? Could SpaceX raise more equity or debt capital? And because it is so expensive, would it be affordable to use the company's current testing method (which involves launching things before they are ready and to gather knowledge when things blow up)? I think unless things are almost perfectly with respect to funding, engineering progress, and the first mission, we might have to pencil in the May 2035 launch window for the realistic trial mission.

But a manned mission may need to wait until 2039 or beyond.

Even if that trial mission is a complete success, it won't likely be completed in time and assessed before the next launch window in July 2037. Therefore, I think the most

[2] The moon is tidal locked with the Earth which means that we always see the same side. During a new moon, that side is dark.
[3] A direct approach requires much more fuel to accelerate and then slow down. The logistics of carrying more fuel is extremely expensive.

reasonable estimate while still being optimistic has the Mars astronauts lifting off in September 2039 and returning in the first half of 2042.

There are caveats related to human spaceflight that could further delay things. I may be underestimating the amount of testing and redundancies needed in order to bring the chances of survival to an acceptable level. Because of the risks and the related costs, human spaceflight is only a small fraction of all spaceflights. There have only been ten manned missions beyond low Earth orbit. Unless there is some urgent imperative to get to Mars, an accident that leads to the loss of the crew might end all efforts. It would not be surprising to me if further testing and the addition of more redundancies and escape systems add years of delays potentially pushing a manned flight out the later 2040s.

With human spaceflight, an accident can end the entire program.

More testing may be needed just to be more confident.

Elon Musk is young enough to see this happen if he stays healthy. And staying healthy is important. I don't think there is anyone else who has the qualities needed push SpaceX through to a successful manned Mars mission.

The presence of Elon Musk might also be necessary to see the program through to landing humans.

So, yes, I think there is an odds-on chance that humans walk on Mars. But I would conclude that it is much further out into the future than the people who bought SpaceX stock at its initial public offering in June.

Timelines are likely longer than what early public SpaceX investors anticipate.

And that brings us around to the investment lesson in all this. People like Elon Musk, Sam Altman, Jensen Huang, Dario Amodei, Jeff Bezos, and Mark Zuckerberg are very good at selling stories and getting investors to invest capital. Good stories need to be very compelling. Sober assessments don't get many people excited (as I am sure you are *not* after reading my buzz killing overview above 😊).

But good stories are needed to generate the hype to attract enough investors. It's the same with other technologies.

Chart 1:

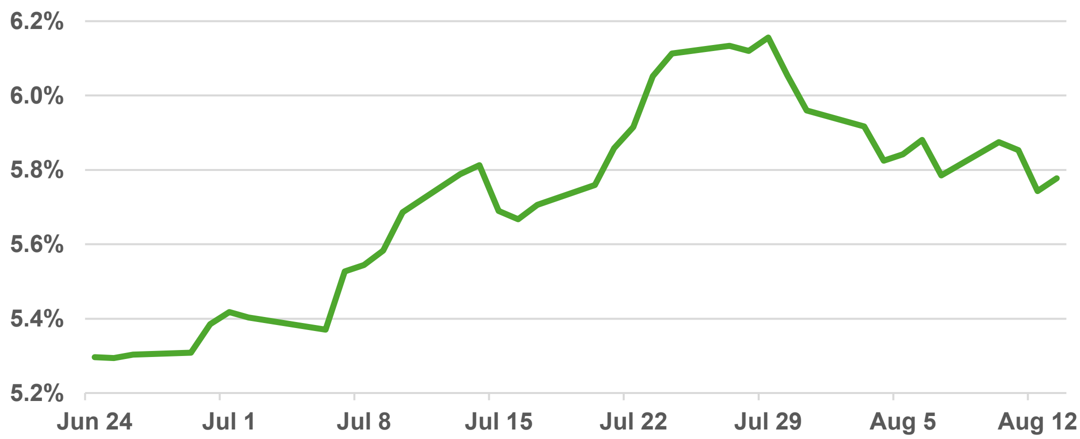
SpaceX Corp Class A Common Shares (USD)

Source: Bloomberg Finance L.P. as of August 12, 2026

This year I have seen countless interviews with the aforementioned individuals. It is very difficult to recall any interviewer seriously challenging the guest on the outlook for space exploration or artificial intelligence or data centres in space, etc. The reporting on SpaceX's IPO was almost unanimously rosy. Sure, the prospectus talked about the risks. And investors know there are risks. But are they pricing for the risks?

Common for the financial media to let the stories go unchallenged and investors may be underpricing the risk.

Chart 2:
The Yield on SpaceX Bonds - 5.35% Coupon Maturing July 15, 2031



Source: Bloomberg Finance L.P. as of August 12, 2026

The one area of dissent has been the bond market. SpaceX issued bonds to raise another $20 billion in capital beyond what they raised during the equity IPO. Despite the IPO propelling SpaceX to a $2.6 trillion USD valuation in the first couple of days (now settled back to $1.9 trillion USD) (**Chart 1**), the bond market's reception has been much more subdued with a BBB rating and currently pricing the five-year bonds to generate a current yield of 5.77% (**Chart 2**). As a comparison, Microsoft's AAA-rated four-year bonds are priced to yield 3.33%.[4] The balance sheet resources for the two companies can comfortably cover current debt loads, so the difference is mostly due to the financial outlook and how it could be impacted by future operations. In that sense, bond market investors seem to have those questions that much of the financial media hasn't asked of SpaceX.

However, investors in SpaceX's bonds appear to be more clear-eyed about the risks.

[4] Source: Bloomberg Finance L.P. as of August 12, 2026.

Model Portfolio Update[5]

The Charter Group Balanced Portfolio
(A Pension-Style Portfolio)

	Target Allocation %	Change
Equities:		
Canadian Equities	15.0	None
U.S. Equities	34.0	None
International Equities	11.0	None
Fixed Income:		
Canadian Bonds	18.2	None
U.S. Bonds	9.8	None
Alternative Investments:		
Gold	7.5	None
Commodities & Agriculture	2.5	None
Cash	2.0	None

No changes to the model portfolios through July and into August.

There have been no changes to the asset allocations or the holdings in any of the model portfolios during July and into August.

Stocks stuck in a narrow band on news that oscillates between positive and negative.

Canadian, U.S., and international stocks have traded in a narrow band this summer. The news regarding AI, semiconductors, software, and the geopolitics of the Persian Gulf have oscillated between positive and negative almost weekly. There has been some rotation away from AI after those stocks had a great run earlier this year, and more towards basic industrial stocks. That has helped the model portfolios on a relative basis. But there has not been any significant breakout for a couple of months now.

There is an issue brewing somewhat beneath the surface. The yields on U.S. government bonds, which the consensus had expected to decline this year, have slowly moved higher. There hasn't been much discussion in the press about this (unless one has a Bloomberg Terminal to stare at). Most of the media's focus has been on the cost of living generally, often focusing on grocery bills and cost to gas up the car. It is as though the media and the public are still buying into the notion that yields and interest rates are going to fall.

[5] The asset allocation represents the current *target* asset allocation of the Balanced Model Portfolio as of August 12, 2026. 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.

Afterall, that tends to be the message from policymakers and politicians, as well as a good number of Wall Street strategists and economists.

That said, one policymaker, Scott Bessent, the U.S. Treasury Secretary, has been busy coordinating with Japan to defend the value of the yen. The theory is that a cheap yen will allow Japanese interest rates to remain low, allowing borrowers to borrow cheaply from Japan and invest that money in things like U.S. Treasury bonds. Believe it or not, this has been a massive trade over the last couple of decades. And more demand for these U.S. bonds increases their price, which mathematically reduces their yield. Since U.S. government bond yields are important in determining the level of borrowing rates in the U.S., all this looks like an effort to tamp down U.S. yields and interest rates. This action could be related to the upcoming U.S. midterm elections. Or it could be because of a growing concern as to how high U.S. interest rates might negatively impact parts of the U.S. financial sector and institutions. Higher rates are often bad news for the prices of both stocks and bonds. If the yen intervention is not successful (it has not been going that well), then the resulting situation could cause some market volatility just over the horizon.

Below is the 12-month performance of the asset classes that I have used in the construction of The Charter Group's model portfolios. (**Chart 3**).[6]

There is some angst in the bond market reflected by stubbornly high yields.

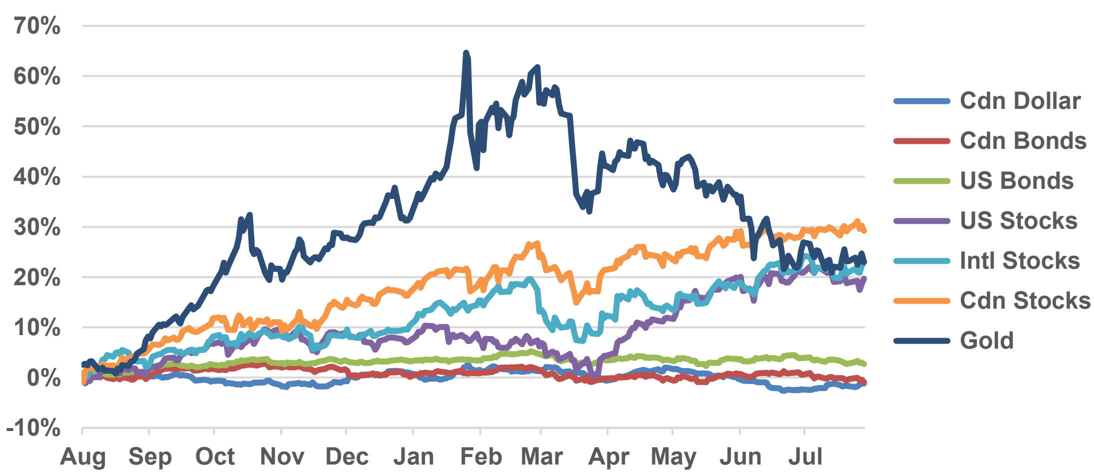
Concerns about government spending and inflation might be feeding this.

Also, a lower Japanese yen might trigger higher Japanese yields which could spillover and lead to higher rates in the U.S.

So, U.S. policymakers are intervening to keep the yen from falling further – could indicate a significant degree of worry about this.

Chart 3:

12-Month Performance of the Asset Classes (in Canadian dollars)



Source: Bloomberg Finance L.P. for the interval from August 1, 2025 to July 31, 2026

[6] 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 Core Canadian Universe Bond Index; 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 Issues[7]

Issue	Importance	Portfolio Impact
1. Global Geopolitics	Significant	Negative
2. Global Trade Wars & Alliances	Moderate	Negative
3. Inflation from Tariffs (Portfolio Impact)	Moderate	Positive
4. Tariffs: Slowing Economic Growth	Moderate	Negative
5. Canadian Dollar Decline	Medium	Positive
6. U.S. Fiscal Spending Stimulus	Medium	Positive
7. Growing U.S. Credit Risks	Medium	Negative
8. Canadian Federal Economic Policy	Medium	Positive
9. China's Economic Growth	Light	Negative
10. Long-term U.S. Interest Rates	Light	Negative

[7] 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 August 12, 2026.

The information contained herein has been provided by Mark Jasayko, Senior Portfolio Manager and Senior Investment Advisor, TD Wealth Private Investment Advice, and is for information purposes only. The information has been drawn from sources believed to be reliable. Graphs and charts are used for illustrative purposes only and do not reflect future values or future performance of any investment. The information does not provide financial, legal, tax or investment advice. Particular investment, tax, or trading strategies should be evaluated relative to each individual's objectives and risk tolerance.

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