CIO Quarterly Commentary

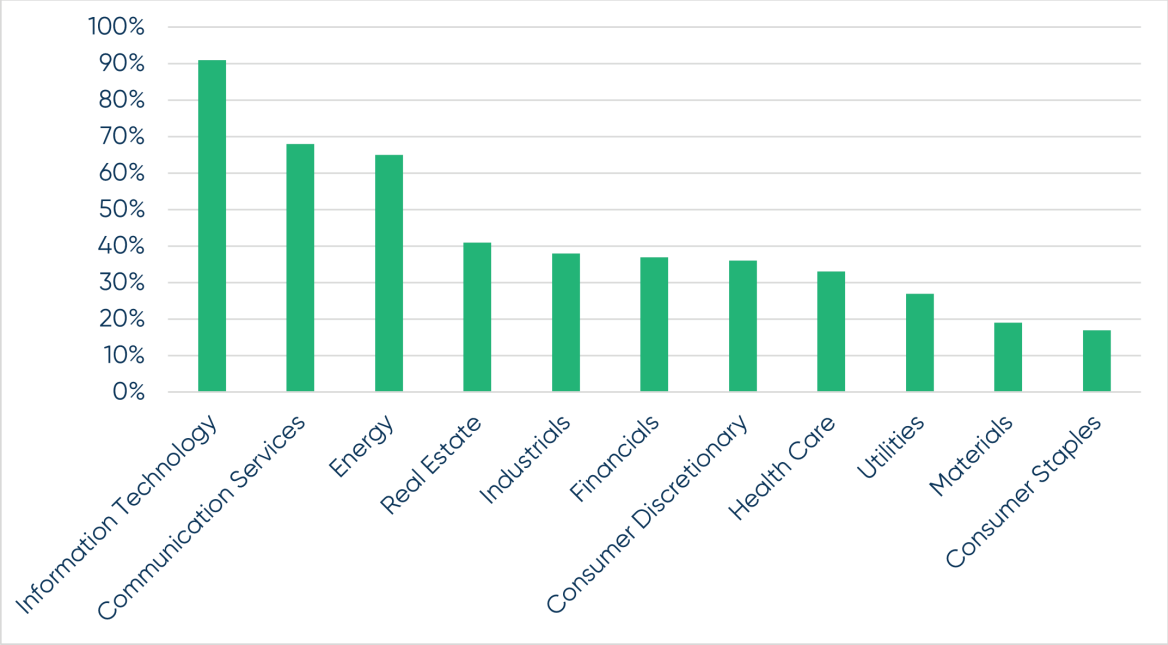
Q2 2024

TIFF INVESTMENT MANAGEMENT

The Times, They Are About to Change

Every quarter for nearly nine years we have sent this CIO Commentary with the goal of sharing our view of what is happening in the global capital markets and how we are incorporating that information into the portfolios we manage for you. We will do a little of that this quarter before sharing with you some comments from Jensen Huang, Co-Founder and CEO of NVIDIA. Mr. Huang's company makes the fastest and most sought-after graphics processing units (GPUs) in the world. These chips are in high demand to run artificial intelligence (AI) workloads and applications. Whether we like it or not, we are all likely in for more change than normal as we are only in the first few innings of AI development. The chart below highlights the growing focus on AI on recent earnings calls. As you can see, AI mentions are prevalent across companies within every sector.

Record Number of Companies Within S&P 500 Citing "AI" in Q1'24 Earnings Call, Extending Beyond IT Companies[1]



Before going any further, here is a quick rundown on what's going on in the markets. It was another mostly positive quarter with global and US equities up and hedge funds

[1] Source: FactSet, Highest Number of S&P 500 Companies Citing "AI" on Earnings Calls Over Past 10 Years.

also advancing— both despite seesawing interest rates caused by fears of inflation being stickier than anticipated. As you might imagine, this does not surprise us. And we are increasingly beginning to think that whether the US Federal Reserve (Fed) eases in the third quarter, the fourth quarter, or sometime next year is unimportant. Blasphemy, you say! Of course, the timing of the first easing will impact individual quarterly performance. But a year from now, we believe it won't really matter to ultimate returns, other than their timing. In the meantime, we will continue to try to take advantage of opportunities created by other investors who react to each of the latest changes in expected timing. For example, we may further extend duration in fixed income if interest rates push high enough.

Of course, it bears noting that if the Fed actually raises rates due to reaccelerating inflation or unhinged expectations — or, if the central bank lowers rates precipitously due to a material economic slowdown or dramatic increase in unemployment — the Fed (and the whole economy!) would indeed matter. In either case, we might need to rethink our positioning.

For now, we expect stocks will rise and fall with rate cut expectations (up when expectations for easing rise, down when they fall). But in the end, we continue to believe the economy is healthy and that stocks will finish the year higher than they are today. Corporate earnings in Q1 were strong, with 81% of S&P 500 companies beating estimates, supporting the view that the global economy remains firm. Yes, valuations are still somewhat elevated, but as mentioned in earlier letters, firm earnings growth this year can support both modestly higher prices and some moderation in valuations. We remain near our funds' strategic asset allocation targets (65% global equities/20% diversifiers/15% fixed income).

Geo-politics remain messy, but within the range of expectations. We continue to believe that by this time next year both the Middle East and the Russia-Ukraine wars can reach a negotiated settlement (especially important for humanity's sake). The US elections will be over, and our country will have another chance to come together behind whomever wins. In our view, either candidate will spend too much, keeping pressure on the US budget deficit. From that perspective, we're rooting against consolidated power where one party controls both the House and Senate in addition to the oval office.

Finally, yes, we did sort of skim over the possibility of inflation remaining too high. We read JPMorgan Chase chairman and CEO Jamie Dimon's suggestion that the 10-year Treasury could reach 6%, and we take comfort knowing that the Fed read it too. Nobody wants inflation to get out of control again, and the Fed is paying attention. That is why, in our

view, they haven't cut rates even after suggesting it was likely. Like the rest of us, policy makers experienced what 9% inflation feels like; they don't want to move back there. Accordingly, we believe that rates may stay higher for longer, but won't need to be raised. To us this implies that the "rules of the investment game" aren't about to change as they did in 2022, and markets can continue to improve. The biggest long-term concern for us remains the US budget deficit. We recently saw one Wall Street firm publish projections for net coupon supply, specifically what non-Fed investors have to absorb in 2024 by quarter: $340bn, $520bn, $540bn, and $460bn. That's $1.86 trillion in new coupon debt that investors will need to choose to buy. The good news is that the same firm estimates that US households are now receiving $3.7 trillion per annum in interest and dividend payments. All of these are the biggest numbers we've ever seen and may continue to rise for many years to come.

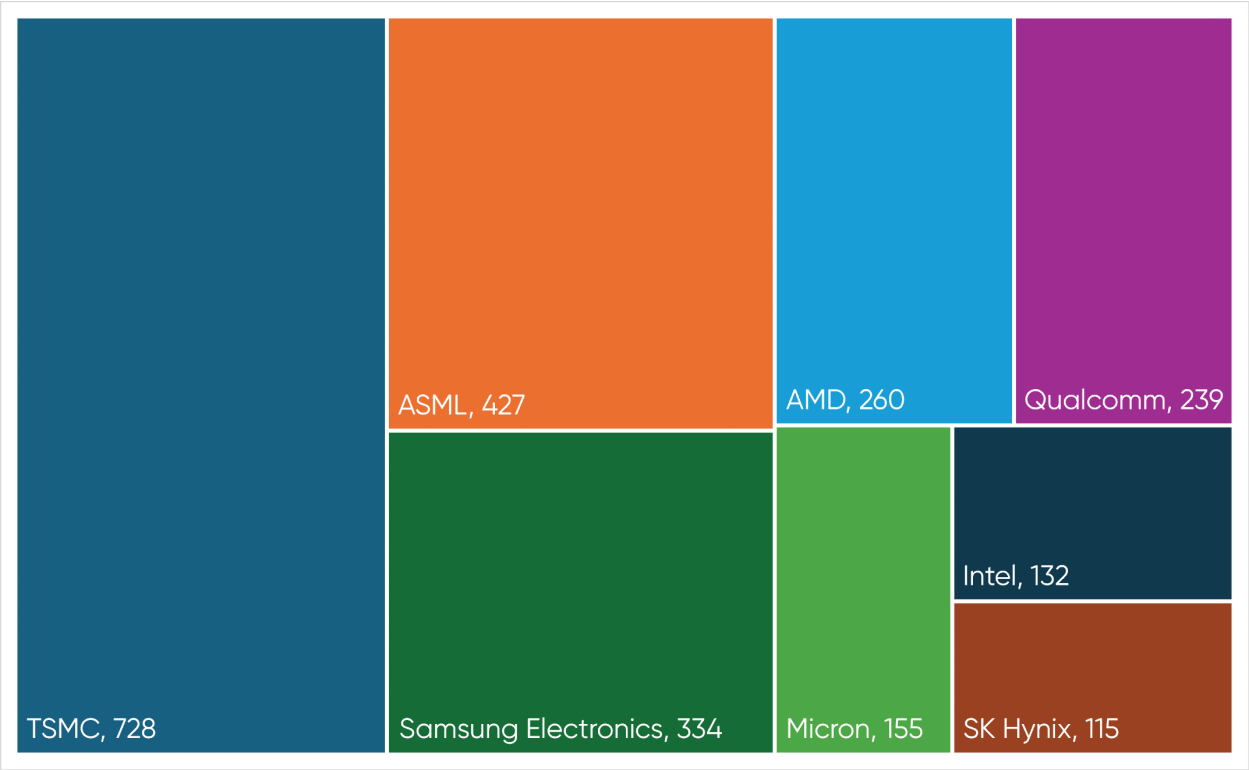
On to Mr. Huang's Comments

Bill Gates believes AI is a brilliant tool that will provide the biggest productivity advancement in our lifetime. Elon Musk has said AI is more dangerous than nukes and, that someday, it will take all of our jobs. Maybe these opinions are correct or maybe not — time will tell. We do believe that AI will have a material impact on society and the future direction of markets, companies, and individuals. We are already seeing the impact of increased demand for semiconductor chips to support the AI revolution. Accordingly, we thought that this quarter it would be good to share with you a bird's eye view of what the CEO of NVIDIA, the leading AI "arms dealer" in the world, said on his recent conference call, during which the company reported Q1 revenue up 262% year over year to $26 billion. This has not gone unnoticed by investors, as shown by this chart:

NVIDIA's Market Cap has Reached $3.1 Trillion in June 2024[2]...

[2] Source: Bloomberg, as of 6/12/2024, weekly data.

...Which has Exceeded Key Semiconductor Companies' Market Cap Total of $2.4 Trillion[3]



Jensen Huang on NVIDIA's May 22, 2024, Q1 Conference Call with Investors:
"The industry is going through a major change. Before we start Q&A, let me give you some perspective on the importance of the transformation.

"The next Industrial Revolution has begun. Companies and countries are partnering with NVIDIA to shift the $1 trillion installed base of traditional data centers to accelerated computing, and build a new type of data center, AI factories, to produce a new commodity, artificial intelligence.

"AI will bring significant productivity gains to nearly every industry, and help companies be more cost- and energy-efficient, while expanding revenue opportunities. CSPs [cloud service providers] were the first generative AI movers. With NVIDIA, CSPs accelerated workloads to save money and power. The tokens [bits of information] generated by NVIDIA Hopper drive revenues for their AI services, and NVIDIA Cloud instances attract rental customers from our rich ecosystem of developers.

"...accelerating demand for generative AI training and inference on the Hopper platform propels our data center growth. Training continues to scale as models learn to be

[3] Source: Bloomberg, as of 6/12/2024, weekly data.

multi-modal, understanding text, speech, images, video and 3D, and learn to reason and plan. Our inference workloads are growing incredibly.

"With generative AI, inference, which is now about fast token generation at massive scale, has become incredibly complex. Generative AI is driving a firm foundation up full stack computing platform shift that will transform every computer interaction. From today's information retrieval model, we are shifting to an answers and skills generation model of computing. AI will understand context and our intentions, be knowledgeable, reason, plan, and perform tasks.

"Token generation will drive a multi-year build-out of AI factories. Beyond cloud service providers, generative AI has expanded to consumer internet companies and enterprise, sovereign AI, automotive, and healthcare customers, creating multiple multi-billion-dollar vertical markets."

In the Q&A session that followed, Mr. Huang answered numerous questions and we highlight one here:

Q: *"Jensen, what checks have you built in the system to give us confidence that monetization is keeping pace with your really, very strong shipment growth?*

A (Jensen Huang): *"The demand for our GPUs in all the data centers is incredible. We're racing every single day. And the reason for that is because applications like ChatGPT and GPT-4o, and now it's going to be multi-modality and Gemini and its ramp, and Anthropic and all of the work that's being done at all the CSPs are consuming every GPU that's out there.*

"There's also a long line of generative AI startups. Some 15,000, 20,000 startups that, in all different fields, from multimedia to digital characters, of course, all kinds of design tool application, productivity applications, digital biology, the movement —the moving of the AV industry to video, so that they can train end-to-end models to expand the operating domain of self-driving cars, the list is just quite extraordinary. We're racing, actually.

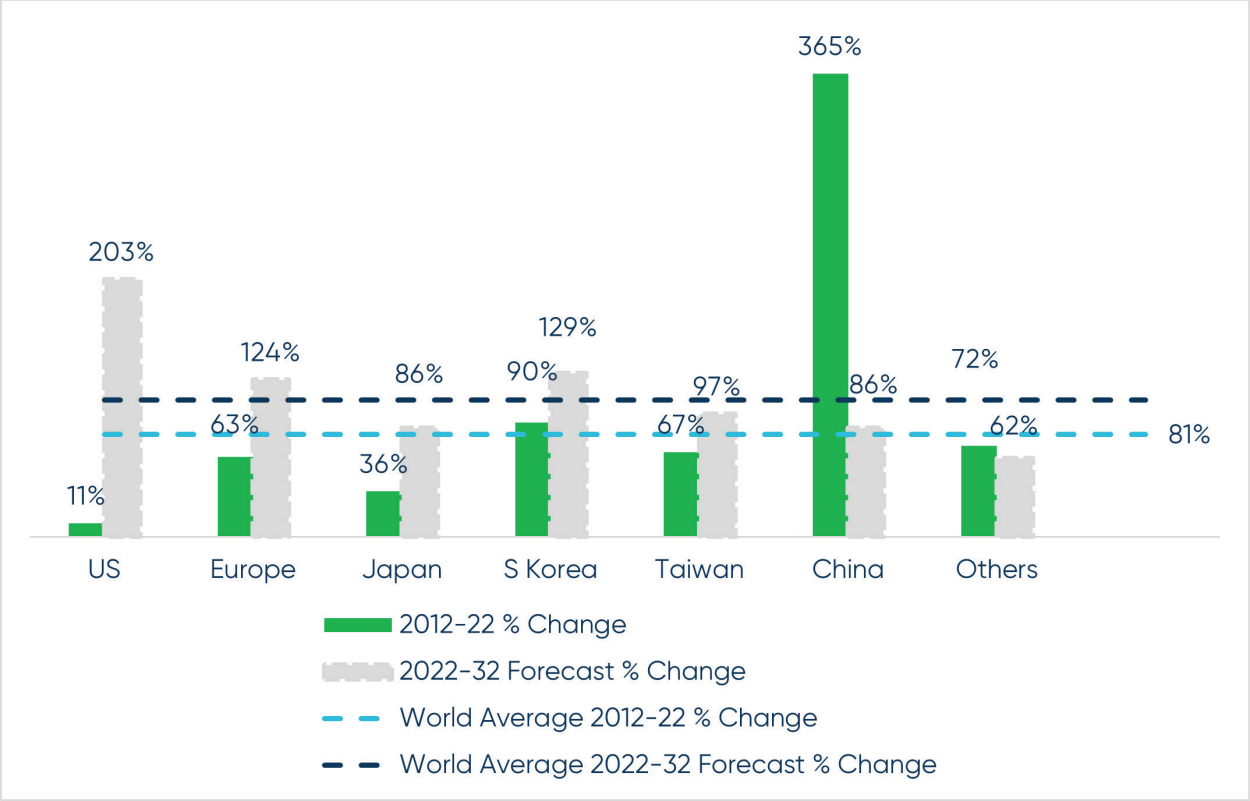
"And the reason for that is because the computer is no longer an instruction-driven-only computer. It's an intention-understanding computer. And it understands, of course, the way we interact with it, but it also understands our meaning, what we intend that we asked it to do, and it has the ability to reason, inference iteratively to process a plan and come back with a solution.

"And so, every aspect of the computer is changing in such a way that instead of retrieving pre-recorded files, it is now generating contextually relevant, intelligent answers."

There is much more from this call that humbles us to read. Technology always moves faster than most of us can imagine. Today, it appears to be accelerating at an even faster pace. The importance of AI and the chips it is built on is not lost on countries either. This chart shows the importance most every country is placing on improving their onshore capabilities in the production of semiconductor chips.

Country's Rate of Growth in Fab Capacity

US fabrication facility (fab) capacity as measured by wafer starts per month (WSPM) is projected to triple over the next decade, increasing by 203%, the largest projected percent increase in the world[4]



What this portends for each of us and for the entire world is hard to predict today, but change is coming in many areas.

It is hard to have a strong opinion about the impact of AI, because we are so early in its evolution today. Asked to share our thoughts at such an early stage is condemning us to future embarrassment. We are constantly trying to catch up with the latest advancements and expect this will continue for many years to come. Therefore, it is with

[4] Source: Semiconductor Industry Association, BCG, May 2024.

great humility that we share our early thoughts on how we believe AI might shape the future.

How will AI Shape the Future?*

The future will be much faster paced than most people are accustomed to. The success of AI will enable those with mastery to change the direction of existing or new firms with a few keystrokes rather than the long and laborious time required to change hearts and minds of co-workers, bosses, and boards. This acceleration of pace will require each of us to adapt and to change much faster. Some will excel in this environment, but many will likely be replaced by machines that can do their jobs faster, better, and cheaper, and without the coddling required to maintain harmony within an organization.

Many try to compare this to the internet bubble in the late 1990's/early 2000's. True, there are similarities, including the prospects of AI breaking out of the tech space to become a productivity and growth enhancer across many industries. The breadth of possibilities has encouraged us to be more understanding around current valuations. New technologies with universal application do not arrive on the scene very often, so properly valuing the most exposed companies today is more difficult than valuing a more entrenched and understandable business. There are also differences from the internet period, some of which make forecasting valuations even more difficult. First, the companies leading the charge today are the best and biggest in the world, locked in an existential fight to lead the AI charge. NVIDIA, the preeminent pick-and-shovel provider, grew its $26 billion Q1 revenue from $19 billion three months earlier, and from just $7.2 billion the year before. The company's customers are essentially the Magnificent Seven, each spending billions to lead in the creation of new revenue streams. Those who can build those revenue streams and fund continuing innovation have the potential to lead technology advances for many years to come. That deep-pocketed corporate spending differs greatly from the internet age, which largely relied on private or other finite pools of capital.

In the early days, AI will most likely find uses in more prosaic tasks, such as operating call centers and writing the most basic portions of software and first drafts of often-written letters and emails. In time, life-extending medical breakthroughs in gene editing and molecular biology, quantum computing, fusion research, and a deeper understanding of what humans really want when they ask for something will all likely see AI applications. Elon Musk postulated that if the number of workers times productivity-per-worker = gross domestic product (GDP), then combining AI with the robots Tesla intends to deliver this year could remove the limit on GDP by essentially making the number of workers limitless.

Less optimistically, this could prove a tricky time for humanity, especially if capable robots can be fitted with the intelligence of a machine that knows everything that has come before it and can process new data with extreme speed. Some suggest that successful people will gravitate away from trying to compete with AI on an intellectual level and focus more on social skills where they will be dealing with humans and emotions. If AI does displace humans as the smartest entities on earth, we will need strong global AI governance policies and enforcement mechanisms to ensure a fair and just transition. Managing this new world for the betterment of all mankind will be hugely important and likely difficult with global guidelines that can be adhered to and enforced. If a rogue actor enlists AI for nefarious purposes, it could become very difficult for those playing by the rules. We suspect other resource constraints will develop and could be contested by those willing to break the rules.

How Are We Incorporating AI at TIFF?

A core component of our job at TIFF is to deploy your capital based on our best estimate of future economic conditions. When a breakthrough technology emerges that could change the future, it is important for us to incorporate that development into our assessments. Because we believe the recent AI advances represent such a breakthrough, we have made three early adjustments to business at TIFF. First, we started to incorporate elements of AI into our workflow and processes to enhance productivity. Second, we shifted some capital within our portfolios to managers we believe are best positioned to make use of this new technology in their processes. Third, we have been careful not to be too far underweight the mega-cap stocks that are most directly involved in leading the AI charge. It is inevitable that some of our assessments will be wrong and that we will need to learn and adjust, but that's OK. As Woody Allen once said, "90% of life is showing up." We will keep learning and trying our best to keep our investments aligned with our best judgments of the future.

The economic trend toward "winner take more," which we are seeing in the hyper scaling of some large tech companies, will likely continue and may even accelerate. Warren Buffet's shift from buying OK companies at great prices to buying great companies at OK prices will likely be rewarded more than ever. It may be that buying great companies at any price becomes a common practice for a period of time. In the end, of course, history has shown that if this sort of stock market behavior gets taken to an extreme it can end badly.

The AI shift could happen faster than we imagine. Over the next several years it will be important for each of us to understand how AI is evolving and being incorporated into

both business and people's daily lives. We all want to hand off the boring, mundane, or difficult parts of our jobs and keep those bits we like. In a perfect world that may be possible. If you enjoy a thinking job, it may be harder to achieve. Nevertheless, we remain optimistic that harnessing AI for good is what lies directly ahead, and any potential downsides will be farther off in the future.

As always, we very much appreciate the opportunity to help manage your capital and to help you achieve your organization's goals. We are here to assist you in any way possible, so please reach out and let us know how we can help.

Your TIFF Investment Team

*With *great thanks* to Oliver Bardon, Brad Calder, Trevor Graham, and Zhe Shen for their help and insights in thinking and writing about how AI might shape our future.

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