MORNING BRIEFING
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The AI Future & Health Care

Check out the accompanying chart collection.

Executive Summary: Don't fear AI, just China's AI aspirations. Out with the CPU, in with the GPU. AI is bound to transform every business process, bar none. Three well respected tech visionaries have been describing our AI-enhanced future with optimistic messages that they insist are not hyperbole. … And: Don't overlook the lagging S&P 500 Health Care sector's potential for a rebound given exciting developments in its biotech and pharma industries. Jackie recaps some of the highlights.

Technology: The AI Wizards Speak. In recent days, three Silicon Valley entrepreneurs have been vocal about the wonders of artificial intelligence (AI). We mean none other than the founding (or co-founding) brains behind Netscape, Nvidia, and both Siebel Systems and C3.ai—respectively Marc Andreessen, Jensen Huang, and Tom Siebel.

Andreessen instructs us not to fear AI because it will make our lives better—if we can beat China to the punch. Huang tells us that the world's data centers will all dump their slow, dumb systems and adopt accelerated computing, which conveniently uses Nvidia's GPUs. And Siebel, who believes we are in the first half of the first inning of the AI transition, believes companies will use AI across all business processes.

Let's take a deeper look at what these three gentlemen have to say:

(1) *AI will save the world.* To say that Andreessen, a renowned venture capitalist, co-founder of Netscape, and a Meta Platforms board member, is a fan of AI is an understatement. "AI is quite possibly the most important—and best—thing our civilization has ever created, certainly on par with electricity and microchips, and probably well beyond those," he wrote in a June 6 *missive* that's a worthwhile read.

AI is generated by computer programs that are owned and controlled by people, he emphasizes, not malevolent, uncontrollable software running killer robots that will end society as we know it. Such fears are held by irrational people who aren't basing their opinions on scientific facts, he contends. Or else, they're held by folks who stand to benefit by making others fearful of AI.

Andreessen envisions a world where every child will have an infinitely patient AI tutor, every person will have an AI assistant, mentor, trainer, advisor, or therapist. And every scientist, artist, businessperson, doctor, etc. will have an AI assistant that will expand the scope of their research or work and achievement. Scientific breakthroughs, new technologies, and new medicines will expand dramatically, as will productivity.

We shouldn't allow the thought police to suppress AI, he warns. "AI is highly likely to be the control layer for everything in the world. How it is allowed to operate is going to matter, perhaps more than anything else has ever mattered."

AI won't take our jobs. Like technologies that came before it, AI will increase the number of jobs as well as wages. AI "may cause the most dramatic and sustained economic boom of all time." AI ultimately will expand until it's in the hands of everyone on the planet. Already generative AI is available for free in the form of Microsoft's Big and Google's Bard.

Andreessen acknowledges that bad people will attempt to commit crimes using AI. But there are laws that make those crimes illegal. The "good guys" have access to AI too, so they can create systems that prevent bad things from happening. For example, people worried about AI-generated fakes should build systems where people can verify themselves using cryptographic signatures (see our June 1 *Morning Briefing* for more on such authentication methods).

Andreessen is far more concerned about AI in the hands of the Chinese Communist Party, which is already using AI to control citizens in China and those in countries that have received Chinese Belt and Road funding or watch consumer apps like TikTok. "The single greatest risk of AI is that China wins global AI dominance and we—the United States and the West—do not."

We "should drive AI into our economy and society as fast and hard as we possibly can in order to maximize its gains for economic productivity and human potential," he writes. Let companies, both big and small, build AI as fast as possible and compete in a free market. Opensource AI should be available to all, including students—enabling them also to compete with large and small companies.

"To prevent the risk of China achieving global AI dominance, we should use the full power of our private sector, our scientific establishment, and our governments in concert to drive American and Western AI to absolute global dominance, including ultimately inside China itself. We win, they lose. And that is how we use AI to save the world."

(2) *AI needs new tech equipment.* Nvidia's CEO Jensen Huang had been steering his company to build GPU chips, hardware, and software that enables accelerated computing. Accelerated computing replaces traditional, linear computer processing, where tasks are performed one at a time using CPU chips. By allowing a computer to process multiple tasks at the same time, accelerated computing saves time, money, and energy.

As Nvidia was developing accelerated computing, ChatGPT was unveiled, and AI captured the world's attention. AI, with the complex computer processing it requires, is the killer app for accelerated computing. Data centers will need to replace their "dumb" traditional systems with systems that have smart networking equipment, smart software, and GPUs to enable accelerated computing.

"[W]e're seeing incredible orders to retool the world's data centers," said Huang in the company's May 24 earnings *conference call*. "[Y]ou're seeing the beginning of call it a 10-year transition to basically recycle or reclaim the world's data centers and build it out as accelerated computing." Since that earnings conference call, Nvidia's shares have rallied 26.0% versus a 3.3% gain in the S&P 500 and a 5.7% gain in the Nasdaq.

(3) *AI throughout the corporation*. C3.ai CEO Tom Siebel didn't hold back when gushing over the AI opportunity during the company's May 31 earnings *conference call*: "I [do] not believe that it's an overstatement to say there is no technology leader, no business leader and no government leader who is not thinking about AI daily. … Business inquiries are increasing, the opportunity pipeline is growing, demand is increasing. … The interest in applying AI to business processes is substantially greater than we have ever seen."

C3's AI systems tap into a company's data to answer questions. The AI will admit not knowing the answer to an inquiry instead of making up an answer ("hallucinating"), as ChatGPT has been known to do. Its programs also provide traceability, so you can see what data was used to arrive at the answer.

"In terms of applying AI to enterprise, we're in the first half of the first inning. … [I]t's clear we will be applying AI to all business processes, production optimization, demand forecasting … stochastic optimization, the supply chain, CRM. I think there is no aspect of business operations … that will not be accelerated by the use of AI. … It is a rocket ship."

The company, which sells AI software applications to corporations and governments, counts the US Air Force as a client. To win the Air Force contract, C3 had promised its predictive maintenance software would help increase aircraft availability by 25% and decrease the cost of maintenance and readiness by about $6 billion. Now the Air Force uses C3's predictive maintenance program on all its assets, not just its planes.

Health Care: Looking for a Cure. The S&P 500 Health Care sector's stock price index has been a serious laggard ytd. The S&P 500 rally has returned, and investors are no longer looking to the Health Care sector as a safe haven, as they were in the second half of 2022. But investors deserting health care stocks in general, and biotech and pharma stocks specifically, are ignoring some of the great advancements that have occurred in drug development. If interest rates have topped out, as we suspect they have, the S&P 500 Biotechnology industry's stocks could benefit as new drugs come to market and the S&P 500 Pharmaceutical industry's stocks could benefit as older drug companies acquire young ones to fill their pipelines.

The Health Care sector's stock price index has fallen 4.8% ytd through Tuesday's close, compared to the 11.6% gain in the S&P 500 and the 34.9% gain in the top-performing Information Technology sector. The S&P 500 Biotechnology industry has had an even rougher start to the year, falling 10.6% through Tuesday's close (*Fig. 1*). Moderna, the Covid-vaccine developer, is among the stocks in the biotech index, as is Regeneron, which developed a Covid treatment. Both companies have faced tough comparisons now that the pandemic has passed. Even the iShares Biotechnology ETF (IBB), with its smaller constituents, has had a tough 2023, falling 1.7% ytd through Tuesday's close.

Are the auspices right for a rebound in biotech stocks? Let's take a look:

(1) *Filling pipelines.* There has been lots of uplifting news about new drug treatments for ailments that range from cancer to Alzheimer's. Some of the following trials were highlighted at this week's American Society of Clinical Oncology meeting in Chicago.

AstraZeneca's Tagrisso, a treatment for lung cancer, halved the death rate for early-stage cancer patients who had undergone surgery, a June 5 CNBC *article* reported. The drug is approved in the US and more than 100 countries, but this study may make physicians more inclined to prescribe it and insurers more willing to pay for it. It was given to people with stage 1, 2, and 3 non-small cell lung cancer who also had a mutation in a receptor called "EGFR." The mutation can make cells divide and multiply excessively, which may cause cancer. The pill functions as an "off" switch for that receptor, the article reported.

There was also good news for breast cancer patients. Ribociclib—owned by Novartis and marketed under the brand name "Kisqali"—was shown to slash the chances of breast cancer returning by 25% when used with standard hormone therapy compared to using hormone therapy alone. The small molecule inhibitor targets cancer-cell proteins that affect cell growth. The drug had already been approved by US regulators to treat cancer that had metastasized, but now it has been shown to help patients with early-stage breast cancer as well, a June 2 *article* in *The Guardian* reported. Its efficacy was slightly less than a drug by Eli Lilly, but it had a more favorable side-effects profile.

Skin cancer patients learned that a mRNA-based vaccine from Moderna and Merck reduces the risk that melanoma would spread by 65% versus another treatment in a mid-stage trial. “The findings add to a growing body of evidence suggesting that mRNA technology … can be used to assemble personalized vaccines that train the immune system to attack the specific type of cancer cells in a patient’s tumors,” a June 5 Reuters *article* reported.

In January, the Food & Drug Administration gave early approval to Leqembi, an Alzheimer’s drug from Eisai and Biogen that may slow the disease’s progression in its early stages. Eisai has said that it would sell the drug, which is not covered by Medicare, for $26,500 a year.

(2) *Fighting with the feds.* The Inflation Reduction Act has cast a pall over some drug stocks because it allows the federal government to negotiate drug prices on behalf of Medicare, and it was expected to save $25 billion annually by 2031. Merck sued the US government on Tuesday, seeking an injunction of the drug price negotiation program, contending that it violates the Fifth and First Amendments to the *US Constitution*, a June 6 Reuters *article* reported.

The Fifth Amendment “requires the government to pay just compensation for private property taken for public use.” The First Amendment is breached when the government forces companies to sign agreements saying the drug prices are fair. The program’s negotiations are slated to begin in September on the 10 drugs identified by the Centers for Medicare & Medicaid Services as most costly.

The Federal Trade Commission (FTC) also shocked health care investors when it filed a lawsuit in federal court seeking to block Amgen’s $27.8 billion acquisition of Horizon Therapeutics. The agency contends that the acquisition “would allow Amgen to ‘entrench the monopoly positions’ of Horizon’s eye and gout drugs,” which don’t currently face any competition, a May 16 *WSJ* *article* reported. The FTC said Amgen could offer higher rebates on the two drugs to companies that manage drug benefits in exchange for the drugs receiving a “preferred position on lists of covered medicines.” Amgen said that it has told the

FTC it would do no such thing.

(3) *Tough Covid comps.* Moderna represents one of the best examples of Covid's impact on companies' income statements. The maker of the mRNA vaccine that now protects us against Covid saw its fortunes soar during the pandemic. The company's earnings jumped to $20.10 a share in 2022, and its shares rocketed from $20.51 on January 1, 2020, to a peak of $484.47 on August 9, 2021. Now that the pandemic has passed, analysts forecast a loss of $2.14 a share in 2023 and a loss of $4.10 in 2024, and Moderna shares have fallen to $126.90 as of Tuesday's close.

Likewise, earnings for the S&P 500 Biotechnology industry rose 12.1% in 2020 and 39.5% in 2021, only to fall by 2.5% last year. Industry analysts' consensus forecasts imply another 22.0% drop in earnings this year and a return to growth next year, when earnings are expected to inch higher by 3.1% (*Fig. 2*). The swing isn't as large as that of the S&P 500 Pharmaceutical industry, which reported a 15.7% jump in earnings last year but is expected to experience a 15.5% decline in earnings this year with a recovery of 9.5% earnings growth forecast in 2024 (*Fig. 3*).

Forward P/E multiples in both industries have held up, but they are far below the S&P 500's multiple, which has expanded. The S&P 500 Biotechnology industry's forward P/E is 14.8, and the S&P 500 Pharmaceutical industry's forward P/E is 14.7, compared to the S&P 500's forward P/E of 18.1 (*Fig. 4* and *Fig. 5*).

(4) *IPO market shut tight.* The biotech industry gets much of its public funding from the IPO market, and the IPO window has been slammed shut this year. The amount of funding raised by US IPOs has fallen by 33% ytd, according to Dealogic *data* in the *WSJ*. The impact on the health care sector has been even more dramatic, with only $1.1 billion raised in US health care IPOs, down from the $2.0 billion raised during the same period in 2022. However, continued innovation and falling private-market valuations have helped venture capitalists raise $6.8 billion during Q1; annualized, that represents a faster pace than the $21.8 billion raised during 2022 and isn't far from the $28.3 billion raised during the record-high year of 2021.

Investors are optimistic about the future impacts of AI on the industry. "[S]tartups [are applying] machine-learning to ever-larger biological and medical data sets to create insights that will lead to new treatments and better patient care," a May 25 *WSJ* *article* noted. "Companies we're funding today are not just a chemist and a biologist, there's a computer scientist in the mix and there's a heavy computational component," said Stuart Peterson, managing partner of Artis Ventures, a venture firm that seeks opportunities at the intersection of biology, health, and technologies, such as AI.

Calendars

US: Thurs: Initial & Continuous Claims 238k/1.80m; Fed's Balance Sheet; Wholesale Inventories -0.2%; Natural Gas Storage. **Fri:** Baker-Hughes Rig Count; WASDE Report. (Bloomberg estimates)

Global: Thurs: Eurozone GDP 0.0%q/q/1.2%y/y; Eurozone Employment Change 0.6%m/m/1.7%y/y; China CPI -0.1%m/m/0.4%y/y; China PPI -3.2%y/y. **Fri:** Italy Industrial Production 0.1%m/m/-4.1%y/y; Spain Consumer Confidence; Canada Employment Change 23.2 & Unemployment Rate 5.1%; Canada Capacity Utilization 82.2%; De Guindos; Enria. (Bloomberg estimates)

Strategy Indicators

Stock Market Sentiment Indicators (*link*): The *Bull-Bear Ratio* rose for the third week to 2.38 this week, the highest since the week of November 23, 2021. *Bullish* sentiment rose for the fourth week by 6.7ppts (to 51.3 from 44.6) to its highest percentage since November 2021. *Bearish* sentiment edged down for the third week to 21.6% this week—the fewest bears since early January 2022. The correction count moved down for the fourth week to 27.1%, a seven week low—remaining well below its late September 2022 peak of 40.3%. Turning to the *AAII Sentiment Survey* (as of June 1), both bullish and neutral sentiment rose during the week, while bearish sentiment declined, though continued its steak of above-average readings. The *percentage expecting stock prices to rise* over the next six months climbed for the second week by 6.2ppts (to 29.1 from 22.9), keeping optimism within its typical range for just the fourth time in the last 15 weeks. Still, it remains below its historical average 37.5% 78 of the last 80 weeks. The *percentage expecting stocks to fall* over the next six months fell 2.9ppts to 36.8%, remained above its historical average of 31.0% 75 of the past 80 weeks. The *percentage expecting stock prices will stay essentially unchanged* over the next six months rose 1.2ppts to 34.1%—above its low of 31.5% for the 19th time over the past 22 weeks.

S&P 500 Earnings, Revenues, Valuation & Margins (*link*): The S&P 500's forward profit margin rose 0.1pt w/w to 12.5% during the June 1 week, up from a 24-month low of 12.3% during the April 27 week. That's down 0.9pt from its record high of 13.4% achieved intermittently in 2022 from March to June. It's now 2.2pts above its seven-year low of 10.3% during April 2020. Forward revenues improved 0.3% w/w its first record high since the May 4 week. Forward earnings gained 0.9% w/w to 3.1% below its record high during the June 16, 2022 week. Both had been steadily making new highs from the beginning of March 2021 to mid-June; prior to that, they peaked just before Covid-19 in February 2020. The consensus expectations for forward revenues growth improved 0.3pt w/w to a seven-month high of 3.4% and is now up 1.1pts from its 33-month low of 2.3% during the February 23 week. That's down from a record high of 9.6% growth at the end of May 2021 and compares to 0.2% forward revenues growth during April 2020, which was the lowest reading since June 2009. Forward earnings growth improved 0.9pt w/w to an eight-month high of 6.9% and is now 3.4pts above its 31-month low of 3.5% in mid-February. That's down from its 23.9% reading at the end of April 2021, which was its highest since June 2010 and up substantially from its record low of -5.6% at the end of April 2020. Analysts expect revenues to rise 1.9% in 2023 (unchanged w/w) and 4.6% in 2024 (unchanged w/w) compared to a revenues gain of 12.2% in 2022. They expect earnings growth of 0.4% in 2023 (up 0.1ppt w/w) and an 11.4% rise in 2024 (unchanged w/w) compared to an earnings gain of 7.2% in 2022. Analysts expect the profit margin to drop 0.2ppt y/y to 12.0% in 2023 (unchanged w/w), compared to 12.2% in 2022, and to rise 0.8ppt y/y to 12.8% in 2024 (unchanged w/w). The S&P 500's weekly reading of its forward P/E rose 0.1pt w/w to 18.1, and is now 0.4pt below its 43-week high of 18.5 during the February 16 week. That's up from a 30-month low of 15.3 in mid-October. It also compares to 23.1 in early September 2020, which was the highest level since July 2000 and up from a 77-month low of 14.0 in March 2020. The S&P 500 weekly price-to-sales ratio rose 0.03pt w/w to 2.26, and is now 0.03pts below its 24-week high of 2.29 during the February 16 week. That's up from a 31-month low of 1.98 in mid-October and down from a four-month high of 2.38 in mid-August; it also compares to a record high of 2.88 at the end of 2021 and a 49-month low of 1.65 in March 2020.

S&P 500 Sectors Earnings, Revenues, Valuation & Margins (*link*): Looking at the 11 S&P 500 sectors, the June 1 week saw consensus forward revenues rise for 10 sectors and forward earnings rise for nine sectors. The forward profit margin rose w/w for all but the Real Estate sector. Four sectors have forward revenues at a record high this week: Communication Services, Consumer Staples, Health Care, and Real Estate. Among the remaining seven sectors, only Energy and Financials have forward revenues more than 5.0% below their post-pandemic highs. Industrials and Utilities have forward earnings at a record high this week, and Consumer Staples remains close to its recent record on May 4.

Among the remaining eight sectors, just two have forward earnings down more than 10.0% from their post-pandemic highs: Energy and Materials. Since mid-August, all but the Industrials sector have seen forward profit margins retreat from their record highs, but more than half of them are showing early signs of recovering from their lows in early 2023. Industrials' forward profit margin is at a record high again this week, and Health Care is at a record low. Those of Communication Services, Consumer Discretionary, Financials, Real Estate, and Tech remain close to their post-pandemic highs. Energy and Industrials were the only two sectors to have their profit margins improve y/y for full-year 2022, and these five sectors are expected to see them improve y/y in 2023: Communication Services, Consumer Discretionary, Financials, Industrials, and Utilities. Here's how the sectors rank based on their current forward profit margin forecasts along with their record highs: Information Technology (23.9%, up 0.2pts w/w and down from its 25.4% record high in June 2022), Financials (18.5, up 0.1pt w/w and down from its 19.8 record high in August 2021), Real Estate (17.0, down from its 19.2 record high in 2016), Communication Services (15.2, up 0.2 pts w/w and down from its 17.0 record high in October 2021), Utilities (12.9, up 0.1pt w/w and down from its 14.8 record high in April 2021), S&P 500 (12.5, up 0.1pt w/w and down from its record high of 13.4 achieved intermittently in 2022 from March to June 2022), Energy (11.3, down from its 12.8 record high in November), Materials (11.1, up 0.1pt w/w and down from its 13.6 record high in June), Industrials (10.6, new record high this week), Health Care (9.5, new record low this week), Consumer Discretionary (7.6, up 0.1pt w/w and down from its 8.3 record high in 2018), and Consumer Staples (6.8, up 0.1pt w/w and down from its 7.7 record high in June 2020).

S&P 500 Sectors & Industries Forward Profit Margin Since March 30 Bottom (*link*): The S&P 500's forward profit margin rose 0.6%, or 0.1ppt w/w to 12.5% from 12.4% as of the June 1, 2023 week. It's now up 0.2ppts from a two-year low of 12.3% during the March 30 week. Eight of the 11 sectors' margins have improved with the S&P 500's gain paced by five sectors. It's still down 7.2%, or 0.9ppt, from its record-high 13.4% during the June 9, 2022 week, as 10 of the 11 sectors' margins have declined since then, with the S&P 500's drop paced by just three of the 11 sectors. Here's the sector performance since the S&P 500's forward profit margin bottom on March 30: Communication Services (up 6.0% to 15.4%), Consumer Discretionary (up 4.1% to 7.6%), Industrials (up 3.8% to 10.6%), Information Technology (up 3.4% to 24.1%), Real Estate (up 2.1% to 17.0%), S&P 500 (up 1.6% to 12.5%), Financials (up 0.8% to 18.6%), Consumer Staples (up 0.7% to 6.8%), Materials (up 0.5% to 11.1%), Health Care (down 0.7% to 9.5%), Utilities (down 1.4% to 13.0%), and Energy (down 3.4% to 11.3%). These are the best performing industries since the March 30, 2023 bottom: Casinos & Gaming (up 60.6% to 5.9%), Publishing (up 24.8% to 3.0%), Multi-Sector Holdings (up 13.9% to 10.5%), Passenger Airlines (up 13.0% to

6.0%), Commodity Chemicals (up 11.9% to 6.6%), Wireless Telecommunication Services (up 11.6% to 12.8%), Hotels, Resorts & Cruise Lines (up 10.4% to 12.6%), Interactive Media & Services (up 9.7% to 21.8%), Home Furnishings (up 9.4% to 5.9%), and Semiconductors (up 8.2% to 28.4%).

US Economic Indicators

Merchandise Trade (*link*): The *real merchandise trade deficit* widened sharply in April, suggesting trade could be a drag on Q2 real GDP. The real trade deficit swelled to $95.8 billion in April after narrowing from $88.4 billion in February to $82.3 billion in March, averaging deficits of $85.4 billion during Q1. Trade was a neutral contributor to Q1 real GDP. Real exports in April fell 5.6%, the steepest monthly decline since April 2020, while real imports advanced 2.4%. Real exports hit a new record high at the start of the year and is down 6.8% since then. Looking at *real exports versus a year ago*, they're down 0.8%—the first yearly decline since February 2021, with exports of foods, feeds & beverages (-13.8% y/y) posting the biggest decline, followed by industrial supplies & materials (-2.8) and nonfood consumer goods ex autos (-0.8), while exports of other goods (19.1), automotive vehicles, parts & engines (6.1%), and capital goods ex autos (0.7) were all in the plus column. Turning to real imports, they're down 2.1% y/y, fluctuating between positive and negative recently. Imports of nonfood consumer goods ex autos (-11.6) recorded the biggest decline, followed by foods, feeds & beverages (-9.0) and capital goods ex autos (-1.5), while automotive vehicle, parts & engines (7.9), industrial supplies & materials (4.1), and other goods (3.2) recorded gains.

Global Economic Indicators

Germany Industrial Production (*link*): German industrial production was weaker than expected and came on the heels of a weak manufacturing orders report. Germany's *headline production, which includes construction*, rose 0.3%, half the expected 0.6% gain, and follows a 2.1% decline in March, which was slower than the initial 3.4% drop. It started 2023 strong, climbing 5.2% the first two months of the year. Meanwhile, *production excluding construction* (which the overall Eurozone uses) was flat in April, following a 1.9% drop in March (vs initial 3.1% drop). Construction output rose for the third time this year, rising 2.0% in April and 11.9% ytd. Meanwhile, energy output fell 1.5%, with industrial production ex construction and energy up only 0.1%. Manufacturing output edged up 0.1%, while March's 1.9% decline was smaller than the initial 3.2% decline, with manufacturing production up 2.2% ytd. Looking at the main industrial groupings, *consumer nondurable goods production* was the only industrial group to post a gain in April, rebounding 2.3%, though is up 1.9% so far this year. Intermediate goods production is up 5.1% ytd, though all the gain took place at the start of the year, with it contracting 1.9% in March and 0.2% in April. Capital goods production slipped 0.3% in April and 3.2% during the two months through April, after not posting a decline since March 2022—up 17.9% over that period. Consumer durable goods production fell 2.1% after climbing 2.6% and 2.2% the prior two months.

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