MORNING BRIEFING
June 1, 2023

Tech, AI & Irises

Check out the accompanying chart collection.

Executive Summary: The stock price indexes of the S&P 500 Information Technology sector and its top-performing industry ytd, Semiconductors, have left their peers in the dust. Not only has the transformative potential of AI whetted investors' appetite for tech; so have semiconductor companies' rosier earnings outlooks now that they're out from under their inventory glut. Does this tech rally have legs? We think so over the longer term, since earnings prospects are bound to rise as AI spending and the semiconductor cycle head north. … Also: Irises have caught our eye, specifically their potential for "authenticating humanity." OpenAI CEO Sam Altman envisions that potential changing the world.

Technology: More Than AI. Two powerful forces are driving the amazing rally in all-things-tech. First there's the excitement about artificial intelligence (AI) and how it will change the world. The arrival of the next new thing is expected to boost demand for advanced semiconductors and devour space in cloud servers. Less appreciated is the fact that the AI boom comes just as the pandemic-related semiconductor inventory glut has been worked off and investors were beginning to anticipate better times in the second half of this year.

While Nvidia rightfully has captured headlines because its chips are leading the AI race, many other semiconductor names are having a banner year as well. Looking at the 20 best-performing stocks in the S&P 500 ytd through Tuesday's close, eight are either semiconductor companies or provide services or products to semiconductor companies: Nvidia (174.5%), Advanced Micro Devices (93.4), Lam Research (49.9), Cadence Design Systems (46.1), Monolithic Power Systems (45.6), Synopsys (45.6), Broadcom (43.7), and Micron Technology (43.4).

Even industry laggard Intel came out with news yesterday that sent its shares up almost 5%. Intel CFO David Zinsner said the company was on track to generate $12.0-$12.5 billion of revenue in Q2, at the high end of Intel's April outlook of $11.5-$12.5 billion, according to a May 31 Reuters *article*. He also said the company's foundries could make wafers for customers who make AI products.

The S&P 500 Semiconductors stock price index is up 67.3% ytd and is only 0.4% away from taking out its all-time high (*Fig. 1*). Semiconductors is the best performing industry within the S&P 500 Information Technology sector.

This double-dose of positivity helped most tech-related industries and sectors vastly outperform the rest of the stock market. Here's how industries in the S&P 500 Information Technology sector have performed ytd through Tuesday's close: Semiconductors (67.3%), Systems Software (37.3), Technology Hardware, Storage & Peripherals (35.5), Information Technology sector (34.8), Application Software (29.1), Internet Services & Infrastructure (9.4), Electronic Manufacturing Services (7.2), IT Consulting & Other Services (3.9), Electronic Components (-0.3), Technology Distributors (-2.2), and Electronic Equipment & Instruments (-2.6) (*Fig. 2*).

And of course, the S&P 500 Information Technology sector is the best performer of the 11 S&P 500 sectors ytd through Tuesday's close: Information Technology (34.8%), Communication Services (32.3), Consumer Discretionary (19.2), S&P 500 (9.5), Industrials (-0.4), Materials (-2.7), Consumer Staples (-2.9), Real Estate (-3.5), Financials (-6.5), Health Care (-7.0), Utilities (-9.4), and Energy (-11.2) (*Fig. 3*).

The tough question is just how far can this tech rally run? The good news is that many earnings estimates for this year and next have risen. The bad news is that earnings multiples have risen as well—and some by a greater amount. Here's a look at the collective earnings prospects of companies in the S&P 500 Information Technology sector and the collective P/Es of their stocks:

(1) *Earnings provide some support.* Earnings growth in the S&P 500 Information Technology sector is expected to rebound in 2024, rising 15.4%, a marked improvement from the 3.2% decline forecast for this year. As a result, the sector's earnings growth is expected to fly from among the worst in the S&P 500 this year to among the best next year.

Here are the 2023 and 2024 earnings growth estimates for the S&P 500 and its 11 sectors: Consumer Discretionary (24.1% in 2023 and 18.6% in 2024), Communications Services (16.7, 17.7), Information Technology (-3.2, 15.4), Industrials (14.6, 13.4), S&P 500 (0.3, 11.4), Real Estate (-17.2, 10.0), Consumer Staples (2.1, 9.1), Health Care (-9.2, 9.1), Financials (11.4, 9.0), Utilities (6.4, 8.3), Materials (-16.9, 4.8), and Energy (-24.6, 0.9) (*Fig. 4*).

Among industries within the S&P 500 Information Technology sector, the Semiconductor industry is expected to enjoy the strongest earnings improvement from 2023 to 2024. The S&P 500 Semiconductor industry's earnings are forecast to climb 34.3% in 2024, a vast improvement from the 19.0% decline anticipated this year (*Fig. 5*). Analysts' consensus estimates for the industry's 2023 earnings had been declining for roughly a year until February, when they started heading higher, while y/y growth remained in negative territory. Meanwhile, most 2024 earnings estimates have been heading higher since late 2022 and have dipped only slightly from very high levels in recent weeks.

Here is how S&P 500 Technology industries' earnings are expected to perform in 2023 and 2024: Semiconductors (-19.0%, 34.3%), Application Software (19.4, 16.1), Electronic Components (-4.5, 15.9), Information Technology sector (-3.2, 15.4), Electronic Manufacturing Services (-11.1, 15.2), Systems Software (6.1, 13.5), Internet Services & Infrastructure (8.2, 12.5), Technology Hardware, Storage & Peripherals (-7.7, 10.7), Technology Distributors (-3.0, 9.7), Electronic Equipment & Instruments (1.3, 9.1), IT Consulting & Other Services (3.8, 8.4), Communications Equipment (14.2, 7.2), and Semiconductor Materials & Equipment (2.9, -7.7) (*Fig. 6* and *Fig. 7*).

(2) *P/Es growing as well.* The improvement in earnings growth prospects hasn't gone unnoticed. Forward P/Es both for the S&P 500 broadly and for many of its sectors and industries have risen from year-ago levels. The S&P 500's forward P/E has climbed to 18.0 from 16.9 a year ago, and the Information Technology sector's forward P/E has jumped by 4.5ppts y/y, the most of any S&P 500 sector, to 24.5. (FYI: "Forward P/Es" are P/Es based on "forward earnings," or the time-weighted average of analysts' consensus operating earnings-per-share estimates for this year and next.)

Here are the forward P/Es of the S&P 500 and its sectors as of May 25 and where they stood one year ago: Real Estate (32.3, 40.1), Information Technology (24.5, 20.0), Consumer Discretionary (23.9, 21.8), Consumer Staples (19.6, 20.4), S&P 500 (18.0, 16.9), Industrials (17.3, 16.8), Utilities (17.0, 20.7), Health Care (16.8, 16.0), Communications Services (16.7, 14.9), Materials (16.0, 14.0), Financials (12.6, 12.2), and Energy (10.3, 10.4) (*Table 1*).

As you'd expect, the Tech sector industries with some of the fastest earnings growth have some of the highest forward P/Es. Industries with forward P/Es that have risen from a year ago include: Systems Software (28.3, up from 24.2 a year ago), Technology Hardware, Storage & Peripherals (26.0 up from 20.2), and Semiconductors (23.8 up from 15.1). But there are Tech sector industries that haven't seen their forward P/Es increase from year-ago levels, including Application Software (27.1 down from 29.3) and Internet Services & Infrastructure (21.2 almost even with 21.1).

More surprising are the lofty forward P/Es of some defensive, non-tech industries in the S&P 500. For example, the Personal Care Products industry sports the highest forward P/E among S&P 500 industries, of 36.3, followed by Diversified Support Services (32.1), and Water Utilities (29.1).

Last night, earnings from C3.AI and Salesforce showed the risk that the recent investor enthusiasm for tech shares poses. Both companies' shares have had a banner year, with C3 shares rising an astounding 292.8% and Salesforce shares climbing 65.1% ytd through Tuesday's close. While both companies reported earnings that largely met Wall Street analysts' expectations, their shares both sold off in aftermarket trading.

While Technology sector stock prices may be due for a short-term breather after their impressive performance this year, we'd continue to expect the sector's forward earnings to be revised higher over the longer term as widespread AI spending ramps up and as the semiconductor cycle heads up. We'd expect share prices to follow suit.

Disruptive Technologies: Proof of Humanity. The AI that drives OpenAI's ChatGPT has spurred deep discussions about what makes a human human. So it isn't surprising that OpenAI CEO Sam Altman has a side hustle that aims to authenticate humanity.

Altman has co-founded Tools for Humanity, which is building a global identifier of humans called "Worldcoin," a crypto currency also called "Worldcoin," and a payment app called "World App." Worldcoin representatives have been taking pictures of humans' irises using The Orb, a five-pound shiny, round object. The pictures are translated into a code that reflects the uniqueness of each human's iris. In exchange for sharing their iris info, the individuals receive a wallet tied to their iris code and the ability to create a World ID since their humanity has been verified.

"It may be easiest to think of [a] World ID as a global digital passport that grants individuals a privacy-preserving way to authenticate as a human online in a world where intelligence is no longer a discriminator between people and AI," a May 29 Worldcoin *blog post* explained.

The wallet, World App, can be used to authenticate humanness with the World ID, to hold Worldcoin tokens, and to send digital money anywhere. "Over time, it will evolve into a toolkit to empower individuals in the Age of AI, enabling the usage of proof of personhood, the equitable global distribution of digital currencies, and ultimately a path to AI-funded UBI," the organization's *website* states ("UBI" stands for "universal basic income.")

Given the rapid development of AI, we can envision a time sometime in the near future when we may want our online consumption to involve verification that it is generated by a human rather than by a nefariously programmed or a hallucinating AI bot posing as a human.

Let’s take a deeper dive into Worldcoin’s efforts to identify every human on Earth:

(1) *Irises trump fingerprints.* We are far from experts on biometrics, but articles indicate that iris scans are easier to take and more accurate to use than fingerprints when it comes to identifying people. This is particularly true in poor countries, where manual labor may have worn away the fingerprints of citizens. Iris scans don’t require physically touching the subject and need to be repeated less often to get a good picture. Fingerprints may need to be repeated to get a good print if the subject is sweating or young.

“Iris scored far higher than fingerprints in terms of ease of use, speed, and overall preference,” according to a study cited in an August 1, 2016 *blog post* by the Center for Global Development.

(2) *Critics abound.* In some ways, Altman has had lofty reasons for developing Worldcoin. According to press reports, he has implied that he was exploring how Worldcoin might be used if UBI and global wealth distribution become a reality. Worldcoin also could give populations that are underserved by financial systems access to them.

Less altruistically, confirming that a Worldcoin user is human could reduce the risk of “Sybil attacks,” which occurs when one entity creates multiple fake accounts that can breach the privacy of a blockchain or can steal funds held on the blockchain. It could also solve the problem that Altman has created with AI: differentiating between human-created “real” online content and AI-created content.

Some watchers are concerned that Worldcoin won’t be able to keep iris data secure. Others speculate that the company may be gathering this data from people who don’t understand the importance of the data they’re sharing. Worldcoin representatives aren’t in the US or China, presumably due to concerns about the legality of cryptocurrencies. But Worldcoin reps have gathered iris pictures from almost 1.8 million people located in at least 24 countries.

The authors of an April 6, 2022 *MIT Technology Review* *article* went to Indonesia and watched Worldcoin representatives taking iris scans of villagers in exchange for cash, Worldcoin tokens, and sometimes even AirPods. “We found that the company’s representatives used deceptive marketing practices, collected more personal data than it acknowledged, and failed to obtain meaningful informed consent,” the authors conclude. “Our interview helped us see that, for Worldcoin, these legions of test users were not, for the most part, its intended end users. Rather, their eyes, bodies, and very patterns of life were simply grist for Worldcoin’s neural networks. [Those taking the iris scans] were paid pennies to feed the algorithm, often grappling privately with their own moral qualms. The massive effort to teach Worldcoin’s AI to recognize who or what was human was, ironically, dehumanizing to those involved.”

(3) *Black market pops up.* A black market for World App identifications has emerged on Chinese social media and e-commerce sites, according to a May 24 CoinDesk *article*. As noted above, World App is not available in China because of the country’s tight controls limiting cryptocurrencies. Worldcoin confirmed in the article that it is aware of individuals who were “incentivized to sign up for a verified World ID that was then delivered to a third party’s World App rather than their own.” Such fraud would seem to undermine the entire reason for establishing the system.

(4) *Investors dive in anyway.* Worldcoin launched with a $1 billion valuation and raised $25 million in funding from lead investor Andreessen Horowitz, along with Coinbase, Reid Hoffman, Day One Ventures, Multicoin, FTX’s Sam Bankman-Fried, and Variant’s Jesse Walden, according to an October 21, 2021 TechCrunch *article*. Worldcoin raised another $100 million in March 2022 at a $3 billion valuation. And most recently, the venture raised $115 million in a Series C round of fundraising. Led by Blockchain Capital, other investors included 16Z, Bain Capital Crypto, and Distributed Global, a May 25 TechCrunch *article* reported.

Calendars

US: Thurs: ADP Employment 170k; Nonfarm Productivity & Unit Labor Costs -2.7%/6.3%; Initial & Continuous Jobless Claims 235k/1.80m; ISM M-PMI & Price Index 47.0/52.0; Construction Spending 0.1%; Fed’s Balance Sheet; Crude Oil Inventories & Gasoline Production; Natural Gas Storage; Harker. **Fri:** Payroll Employment Total, Private, and Manufacturing 180k/160k/8k, Average Hourly Earnings 0.4%m/m/4.3%y/y; Average Weekly Hours 34.4; Unemployment & Participation Rates 3.5%/62.5%; Total Vehicle Sales; Baker-Hughes Rig Count. (Bloomberg estimates)

Global: Thurs: Headline & Core CPI 0.6%m/m/7.0%y/y & 0.8%m/m/5.5%y/y; Eurozone Unemployment Rate 6.5%; Eurozone, Germany, France, Italy, and Spain M-PMI 44.6/42.9/46.1/45.8/47.8; Germany Retail Sales 1.0%m/m/-5.0%y/y; UK M-PMI 46.9; UK Nationwide HPI -0.5%; ECB Publishes Accounts of Monetary Policy Meeting; Lagarde; Enria. **Fri:** France industrial Production 0.3%; Spain Unemployment Change -40.1k. (Bloomberg estimates)

Strategy Indicators

Stock Market Sentiment Indicators (*link*): The *Bull-Bear Ratio* rose for the second week to a six-week high of 2.06 this week, after falling the prior two weeks from 1.94 to 1.83; it was at 2.11 six weeks ago—which was the highest reading since the January 4 week last year. *Bullish* sentiment rose for the third week to 47.9%, after falling the prior three weeks from 50.7% (the highest since November 2021) to 44.6%. Bulls outnumbered bears for the 28th consecutive week. *Bearish* sentiment edged down for the second week to 23.3% this week—the fewest bears since early January 2022—after climbing the prior two weeks from 23.6% to 24.7%. The correction count moved down for the third week to 28.8% after moving higher the prior three weeks from 25.3% to 31.1%—remaining well below its late September 2022 peak of 40.3%. Turning to the *AAII Sentiment Survey* (as of May 25), bullish sentiment moved higher, while neutral sentiment decreased, and bearish sentiment was unchanged—continuing an above-average streak. The *percentage expecting stock prices to rise* over the next six months rebounded 4.5ppts to 27.4% after falling 6.5ppts to 22.9% the prior week—with optimism slightly above the dividing line of typical and unusual low readings for the fourth time in 14 weeks. The *percentage expecting stocks to fall* over the next six months held at 39.7%, remaining within its historical range for the second straight week—above its historical average of 31.0% 74 of the past 79 weeks. The *percentage expecting stock prices will stay essentially unchanged* over the next six months fell 4.5ppts to 32.9%, after rising the prior week from 29.4% to 37.4%—putting neutral sentiment above its historical average of 31.5% for 18 of the past 21 weeks.

S&P 500 Earnings, Revenues, Valuation & Margins (*link*): The S&P 500's forward profit margin remained steady w/w at 12.4% during the May 25 week, up from a 24-month low of 12.3% during the April 27 week. That's down 1.0pt from its record high of 13.4% achieved intermittently in 2022 from March to June. It's now 2.1pts above its seven-year low of 10.3% during April 2020. Forward revenues improved 0.1% w/w to 0.1% below its record high during the May 4 week. Forward earnings gained 0.4% w/w to 3.9% 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 of 3.1% is 0.8pt above 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 0.3pt w/w to 6.0% and is now 2.5pts 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 (up 0.1pt w/w) compared to a revenues gain of 12.2% in 2022. They expect earnings growth of 0.3% in 2023 (up 0.3ppt w/w) and an 11.4% rise in 2024 (up 0.2ppt 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 fell 0.3pt w/w to 18.0, and is 0.5pt 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 dropped 0.03pt w/w to 2.23, and is now down 0.06pts from a 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 May 25 week saw consensus forward revenues and forward earnings rise for seven sectors. The forward profit margin rose w/w for six sectors and fell for five. Consumer Staples and Health Care are the only sectors with forward revenues at a record high this week. Among the remaining nine sectors, just two have forward revenues more than 5.0% below their post-pandemic highs: Energy and Financials. Industrials and Utilities have forward earnings at a record high this week, and Consumer Staples remains close to its their recent record on May 4. Among the remaining eight sectors, just three have forward earnings down more than 10.0% from their post-pandemic highs: Energy, Financials, and Materials. Since mid-August, all but the Industrials sector have seen forward profit margins retreat from their record highs, but 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 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%, down from its 25.4% record high in June 2022), Financials (18.5, 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, down from its 17.0 record high in October 2021), Utilities (12.9, down from its 14.8 record high in April 2021), S&P 500 (12.4, 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 (11.0, 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 (7.5, down from its 8.3 record high in 2018), and Consumer Staples (6.7, down from its 7.7 record high in June 2020).

S&P 500 Sectors & Industries Forward Profit Margin Since Peak (*link*): Since the S&P 500's forward profit margin peaked at a record-high 13.4% during the June 9, 2022 week, it has fallen 8.0% to 12.3% through the May 18, 2023 week. Ten of the 11 sectors' margins are down since the peak, but the S&P 500's drop has been paced by just three of the 11 sectors. Here's the sector performance since the June 9, 2022 forward profit margin peak: Industrials (up 1.7% to 10.6%), Financials (down 2.8% to 18.5%), Consumer Discretionary (down 2.9% to 7.5%), Real Estate (down 5.1% to 17.0%), Energy (down 5.4% to 11.3%), Communication Services (down 5.6% to 15.2%), Information Technology (down 6.1% to 23.9%), Utilities (down 6.6% to 12.9%), S&P 500 (down 7.8% to 12.4%), Consumer Staples (down 8.3% to 6.7%), Health Care (down 13.3% to 9.5%), and Materials (down 18.7% to 11.0%). These are the best performing industries since the June 9, 2022 peak: Casinos & Gaming (up 162.3% to 5.9%), Human Resource & Employment Services (up 103.1% to 18.7%), Wireless Telecommunication Services (up 84.7% to 12.5%), Oil & Gas Refining & Marketing (up 46.3% to 5.0%), Passenger Airlines (up 44.7% to 5.9%), Reinsurance (up 26.3% to 14.8%), Hotels, Resorts & Cruise Lines (up 25.9% to 12.5%), and Oil & Gas Equipment & Services (up 20.1% to 11.0%). The worst performing industries since the June 9, 2022 peak: Commodity Chemicals (down 37.2% to 6.4%), Housewares & Specialties (down 36.4% to 5.3%), Broadcasting (down 35.3% to 3.6%), Copper (down 35.0% to 12.5%), Home Furnishings (down 34.5% to 5.8%), Paper & Plastic Packaging Products & Materials (down 30.4% to 6.1%), and Fertilizers & Agricultural Chemicals (down 29.6% to 14.5%).

US Economic Indicators

JOLTS (*link*): *Job openings* was a surprise on the upside, rising for the first time this year, by 358,000 in April to 10.1 million, after sliding the first three months of this year by 1.5 million to a 23-month low of 9.7 million during March. April's level remains consistent with a tight labor market. The series peaked at a record-high 12.0 million last March. Openings reached 10 million during June 2021 for the first time in the history of the series going back to 2000—remaining above that level through January of this year, before dipping below this March. There were 5.7 million unemployed in April, so there were 1.79 available jobs for each unemployed person that month, up from 1.67 in March—which was the lowest since November 2021 and down from a record high of 2.01 last March. By industry, the *biggest increases* in job openings in April occurred in retail trade (+209,000), health care & social services (+185,000), and transportation, warehousing & utilities (+154,000). Total separations fell 286,000 in April to 5.7 million. Separations include quits, which are generally voluntary separations initiated by employees confident that they can find better pay elsewhere. Quits fell for the fourth time in five months by 49,000 in April and 355,000 over the period to 3.8 million, the lowest since March 2021. Still, quits remain well above pre-pandemic levels. Hirings rose 49,000 in April to 6.12 million after a two-month loss of 261,000. It was at a recent peak of 6.84 million during November 2021.

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