Fall 2023

MFS® Commentary

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Investment Insight

The Rise of Artificial Intelligence (AI)

The launch of ChatGPT late last year brought artificial intelligence (AI) into the mainstream, capturing people's imagination and creating a shift in the competitive landscape. We think hardware manufacturers and software developers and their corporate clients and end customers will all be affected. Company earnings will likely be impacted, and the labor force will need to adapt to more AI in the workplace. Policymakers will need to understand how to regulate an influx of nonhuman inputs to labor and knowledge sharing.

How does it work?

AI has been around for decades. We will focus on generative AI and large language models. Both rely on training and learning from large amounts of data to interpret user inputs and deliver reliable results. Generative AI creates new content, chat responses and designs while large language models deliver the most probable next word as the model constructs a sentence. AI requires training on data sets provided by programmers to function. Data are mainly from online sources or data warehouses and can be proprietary or open source.

What are the limitations of large language models?

Programmers must strike a balance between data quantity, quality and recency and financial costs. Usually, the more data the better; however, more data mean greater costs. Keeping these models up to date is another hurdle. There is already an estimated 60 times as much data in the world today as there was in 2010 — 90% of it generated in the past two years — and that amount is expected to more than double by 2025.[1]

Global data creation is about to explode

Actual and forecast data created worldwide 2010–2035 (in zettabytes)

1 ZETTABYTE is equal to **1 BILLION TERABYTES**

2010	2015	2020	2025	2030	2035
2	12	47	175	612	2142
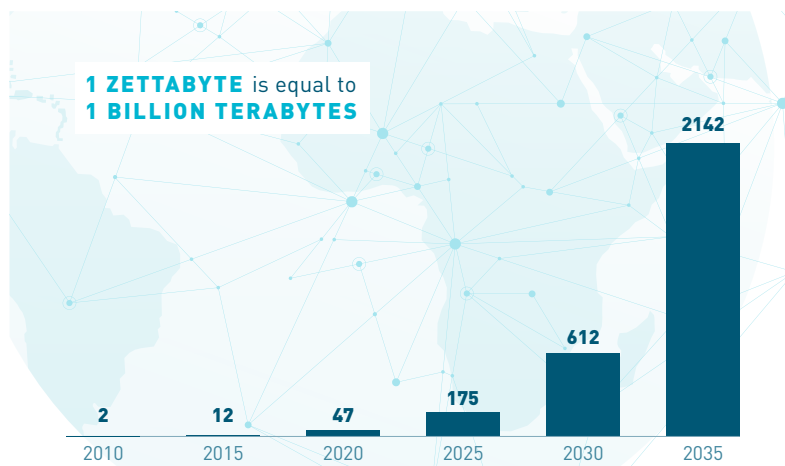
Source: Statista Digital Economy Compass 2019.

[1]Exploding Topics 2023 — https://explodingtopics.com/blog/data-generated-per-day

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Two other limitations of large language models are labor supply and the incremental costs of user searches. On the cost of user searches, for large models, each word they generate requires a new search query that costs significantly more than an online search today. And while costs are falling as technology and applications improve, they remain a concern in the near term.

Who stands to benefit?

The winners are not yet apparent. The first out the gate is not necessarily the long-term winner. For now, our focus is on companies that enable the technology and benefit from increased spending across AI platforms as well as companies for which AI technology could generate higher revenues and lower costs. Some of the obvious winners will be suppliers of high-end graphics processing units (GPUs), cloud computing power and select software. Hardware providers will likely see demand for high-end computers, cloud processing centers and the infrastructure needed for power, cooling and data storage.

Who else could benefit?

Businesses that offer improved products and services to clients deploying AI could also benefit. AI technology can improve creative industries and benefit areas such as health care, factory automation, and logistical and industrial processes. In addition, consultants who help businesses understand and implement the technology could benefit, as well as those with differentiated data sets. We don't believe AI and language models will replace traditional web-based searches. Instead, we believe the rising tide of AI will lift all boats and result in other advantages for current players in the ecosystem.

Who will get disrupted?

Traditional AI models are well suited to driving the automation of routine tasks, workflow and reconciliation. Generative AI and language models take this a step further to produce images, video and text, thus potentially threatening the careers of programmers, writers, graphic designers and video editors. Software solutions may also become redundant. Single-product or horizontal solutions appear most at risk, as are those dedicated to organizing, structuring and analyzing data. Additionally, the integration of AI will alter management's relationship with labor while changing the revenue and earnings paths of multiple industries.

What are the concerns over the societal impacts?

Distinguishing fact from fiction in AI-generated content will be a major concern. Additionally, if AI models are used to train other models, data sets can become tainted and less reliable. AI systems can also be susceptible to bias and errors if trained on skewed, incomplete or outdated data, which can lead to inaccurate results and flawed decisions.

Running AI models uses a lot of energy, and the manufacture of semiconductor chips used to power the technology also requires significant energy, metals and minerals, and chemicals. There are also the broader societal questions that will arise if knowledge workers are disintermediated. Will AI invade our emotional intelligence or make memory and intellect seem less valuable or even unnecessary? Will the spoils go to a few? Could AI get out of control? It is too soon to tell, but these are important societal and policy questions that will need to be addressed. ◢

Retirement Basics

Making the Most of Medicare: What You Need to Know

The rising cost of health care can be a concern when you are preparing for retirement. Medicare can help with some of those costs, but it can be a little complicated. Learn about the major components of Medicare, Parts A, B and D, in this first installment of our three-part series on Medicare.

Medicare Part A

Part A generally covers treatments and services you receive when admitted as an in-patient to a hospital, skilled nursing care facility, inpatient nursing care (but not in long-term care facilities), hospice services or some home health care. With Part A, you can use any hospital or provider that accepts Medicare. While there are no premiums, there can be costs associated with treatments.

To qualify for Part A, you must have worked and paid Medicare taxes for 40 quarters (which need not be sequential). If you did not work and are married to someone who paid into Medicare for 40 quarters, you still qualify. If you are on Social Security Disability, after 24 months of receiving SSDI, you will become eligible for Medicare, regardless of your age, in the 25th month. If you have end-stage renal disease or Lou Gehrig's Disease (ALS), you qualify for Part A.

Medicare Part B

Part B is medical insurance that covers doctors' visits, outpatient services (such as getting stitches or having a cast removed), diagnostic tests (such as MRIs and CT scans) and durable medical equipment (such blood sugar meters, blood sugar test strips, canes and hospital beds). Unlike with Part A, you pay a monthly premium based on tax returns (your income-related modified adjusted gross income) from two years prior. For example, in 2023 this is based of your 2021 tax filing. So high earners generally pay more.

In addition to the monthly premiums, there are other costs. As with Part A, you can see any doctor that accepts Medicare. The cost of the annual deductible for Part B is $226. After that, Medicare covers 80% of the Medicare-approved cost and you cover the remaining 20%. However, the Medicare-approved amount can be lower than the actual cost of the service provided. Many doctors accept the Medicare-approved amount as the full payment. However, others don't accept assignment cost and may charge more. You're responsible for the amount above the Medicare-approved amount on top of the 20% you would normally pay. However, the federal government has mandated that doctors cannot charge more than 15% above the Medicare-approved amount. Check with your doctor(s) to see whether they accept assignment cost.

Medicare Part D

Part D is a prescription drug plan provided by private insurance companies and is not part of Medicare. You can purchase a Part D plan if you are enrolled in Medicare Parts A or B. As with Part B, premiums are based on income levels. While you don't have to enroll in a Part D plan, many people do to help offset prescription drugs expenses. However, if you do not have creditable coverage (coverage that is considered as good or better than Medicare), you may incur penalties.

Part D plans cover a variety of different medications. You can check to see if your prescriptions are included in the formulary (list of medications covered) in a Part D plan. As part of a plan's formulary, the insurance company assigns medications to one of four tiers based on cost. The lower tiers include lower-cost or generic drugs while higher tiers include more costly, name brand or specialty medications. These plans also tend to change each year, so it's a good practice to review your plan.

Four phases of Part D

Part D coverage is made up of four phases. Phase one is your normal deductible phase, when you pay your deductible for your medications and your plan picks up the rest. Once you hit your deductible, phase two starts: You pay a set copayment or coinsurance. The maximum cost in phase two is 25% of the retail cost of your medications. Phase three is known as the coverage gap. During this phase the amount you and your Part D insurance company pay is $4,660 (2023), including your deductible plus the copayments or coinsurance. Once you reach this amount, you pay no more than 25% of the retail cost of your medications. If you pay more than $7,400 in out-of-pocket expenses in 2023, you reach phase four, the catastrophic coverage phase. In this phase, you pay 5% of the cost of the medications or $4.15 for generics or $10.35 for name-brand, whichever is greater.

Look for the next installment of our series — exploring the differences between a Medicare Advantage plan and a Medicare supplement plan (also known as Medigap) — in the Winter Commentary. In our third installment, we will cover considerations on when and what age to apply for Medicare. Given the complexity of Medicare, consider working with your financial advisor and Medicare specialist to understand the costs and determine the best approach for you. Also, you may want to confirm any decision with a Social Security (1-800-772-1213) or Medicare (1-800-MEDICARE) representative.

This material should be used as helpful hints only. Each person's situation is different. Medicare and any other insurance coverage you choose should correspond to your financial needs and goals. MFS does not provide tax, legal, accounting, Social Security or Medicare advice. Clients of MFS should obtain their own independent tax and legal advice based on their particular circumstances. ◢

Source: Medicare.gov

Life Events
Top Places to Leaf Peep

Fall conjures up cool days, cozy sweaters, pumpkins and of course, fall foliage. In the west, the reds, oranges and bright gold hues of the quaking aspens are dramatic against a backdrop of mountains covered with pine, spruce and fir trees. In the Northeast and other parts of the country, maple and birch trees are radiant with striking displays of yellows, deep reds, coppers and oranges. If you're planning a trip to view the fall foliage, consider these top places.

Acadia National Park, Maine comprises nearly 50,000 acres on Mt. Desert Island along the rocky coast. Located about 160 miles northeast of Portland, the park boasts the natural beauty of the Atlantic shoreline and majestic mountains. Peak leaf season in the park traditionally falls in the middle of October. The Acadia All-American Road is one of the best scenic drives. Stay in the nearby coastal town of Bar Harbor, the gateway to the park. While in town, you can take a whale watching tour.

McKenzie River Scenic Byway, Oregon extends for 34 miles, traversing the vineyards of the Willamette Valley and the forests of the Cascade Mountains, treating travelers and road-trippers to views of some of the Pacific Northwest's most beautiful landscapes. Plan your visit for peak season, when the golds and reds are most vibrant, usually in mid-October. The McKenzie River boasts some of the best fly-fishing in Oregon. Other highlights include local farm stands, the historic McKenzie Hatchery in Leaburg and Goodpasture Bridge in Vida, which is the state's second-longest covered bridge.

Charlottesville, Virginia is located in the foothills of the Blue Ridge Mountains and offers spectacular views of fall's vivid hues. Mid-to late October is when you usually see the most dazzling foliage, but the colors can linger into early November. Some of the best viewing spots with scenic overlooks are along the neighboring Blue Ridge Parkway and the connecting Skyline Drive in nearby Shenandoah National Park. When you're not leaf peeping, plan to visit Thomas Jefferson's home Monticello or travel along the Monticello Wine Trail to sample some of Virginia's award-winning vintages.

Payette River Scenic Byway, Idaho is a 114-mile drive in Idaho that begins west of Boise and heads north on state Highway 55. Depending on the year's weather, travelers can see changing leaves as early as the end of August, but peak leaf season typically arrives in early to mid-October. Fun things to do along this route include whitewater rafting in Cascade and camping overnight in Lake Cascade State Park.

Hoosier National Forest, Indiana features some of Indiana's best leaf-peeping locales. The yellows, oranges and reds usually become vivid in mid-October, with peak colors appearing at the end of the month. For active adventures in the colorful scenery, try hiking, biking or horseback riding. You can also hop aboard a train for a ride into the forest on the French Lick Scenic Railway. When you want to kick back and relax, spend an afternoon sipping wine on a scenic Fall Foliage Wine Cruise on Patoka Lake.

Chattanooga, Tennessee sits along the Tennessee River between the Appalachian Mountains and Cumberland Plateau, providing plenty of opportunities for viewing the splendor of colorful forests. In peak season, usually in early November, trees showcase brilliant reds, oranges and yellows. Nearby hiking trails offer some of the best close-up views, such as Rainbow Lake Trail on Signal Mountain. Ride the incline railway to the top of Lookout Mountain for panoramic vistas. You can even board the *Southern Belle* for a sightseeing riverboat cruise on the Tennessee River.

North Lake Tahoe, California and Nevada is surrounded by the majestic peaks of the Sierra Nevada Mountains. There are hundreds of biking and hiking trails where you can see 10-plus different species of trees show off their red, orange and yellow foliage. The best viewing time is from about mid-September to late October, and one of the top viewing spots is Page Meadows in Tahoe City. Other top leaf-peeping locales are Tahoe Meadows, Ellis Peak and Mount Rose Summit. Lake Tahoe is the largest alpine lake in North America, so outdoor adventures, from kayaking and paddleboarding to boating and relaxing on the beach, abound. ◢

Source: U.S. News & World Report L.P, "27 Top Places to see Fall Foliage in 2023," July 12, 2023.

Important Coverdell Education Savings Account Update

If the beneficiary of a Coverdell Education Savings Account you have set up is approaching their 30th birthday, please be aware that the balance in the account must be distributed within 30 days after the date on which the beneficiary turns 30 (unless the beneficiary is deemed a special needs beneficiary as defined under Internal Revenue Code Section 530). Alternatively, the Coverdell account funds may be rolled into a 529 qualified tuition program or the beneficiary on the account may be changed to another member of the family (as defined in Code Section 530) who is not yet age 30.

It is the responsibility of the person who establishes the Coverdell account on behalf of the beneficiary to notify the Coverdell account trustee (MFS® Heritage Trust Company℠) and request the required distribution. Otherwise, the earnings portion of any required distribution that is not rolled over may be subject to federal income tax as well as an additional 10% penalty tax.

For information on how to request a distribution from an MFS Coverdell account, contact our client services department at 1-800-637-1255. They can also help you with any questions you may have regarding your account. For more information regarding distributions from a Coverdell account, please refer to the Distributions section of the MFS Coverdell Education Savings Account Disclosure Statement and Trust Agreement on **mfs.com** (Forms & Applications/College Planning section/Manage an Existing Account).

Ask your advisor about rolling account funds into a 529 Plan. ◢

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