COLUMBIA THREADNEEDLE INVESTMENTS

THEMATIC INSIGHTS

The substitution effect: AI and the labour market

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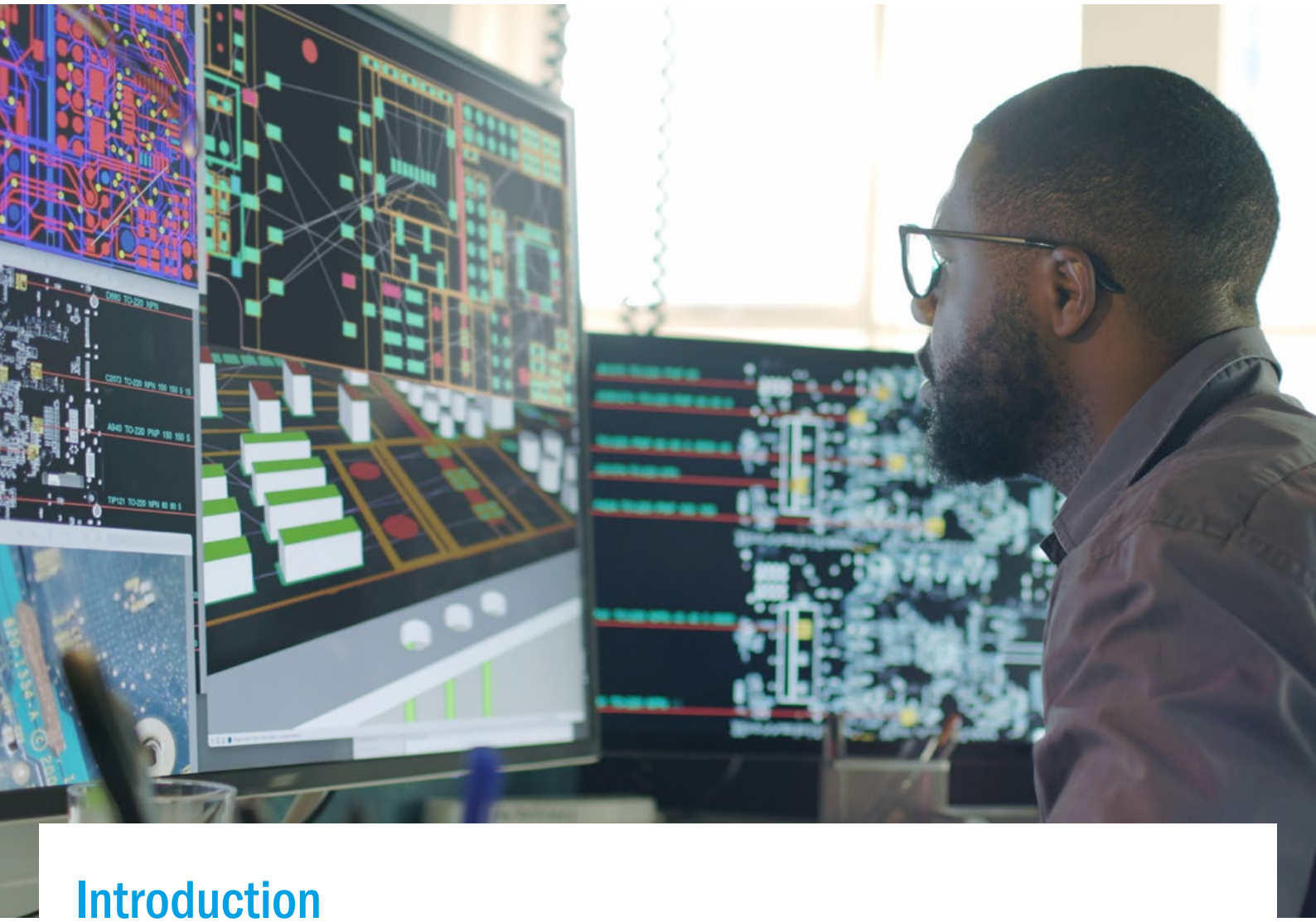
At a glance

- Generative AI could expose hundreds of millions of jobs globally to automation, and while very few will be lost entirely, the majority will be impacted in some form or other. Historically firms have adapted to new technologies, improved their productivity and revenues, and created new roles for humans to do. Indeed, despite all the technological advancements of the past century many advanced economies are experiencing near full employment.
- A significant number of jobs that are done today will however change. With technological transformation accelerating at a faster pace, Columbia Threadneedle has developed a proprietary “Five ‘S’ Framework” to help assess how firms are managing the associated risks and opportunities around their human capital management. Sectors such as healthcare, utilities and catering have the potential to be particularly disrupted.
- We will continue to engage with firms to understand the opportunities generative AI, automation and other technologies can offer, and as the demand for skilled labour rises we will continue to discuss with firms their talent management and planning in terms of long-term risk management.

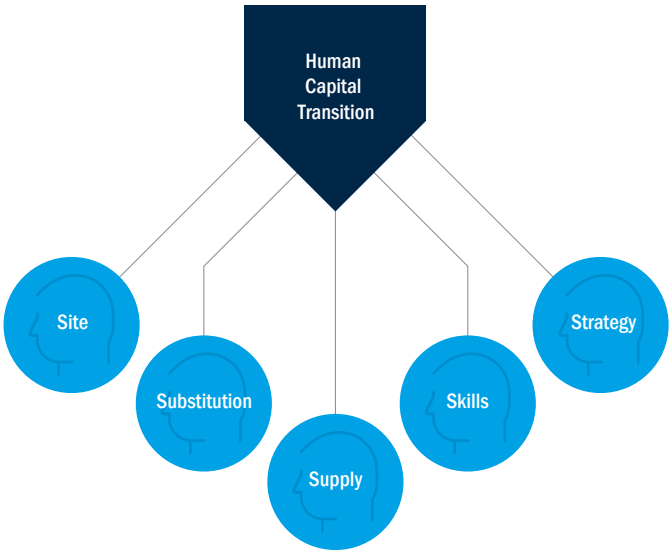


Introduction

At Columbia Threadneedle Investments, we believe firms which recognise and manage their human capital effectively will outperform in the longer term. To help us assess how well an investee firm is doing this we created the "Five 'S' framework of human capital management"[1]. This sets out five factors a firm may consider when managing human capital (Figure 1).

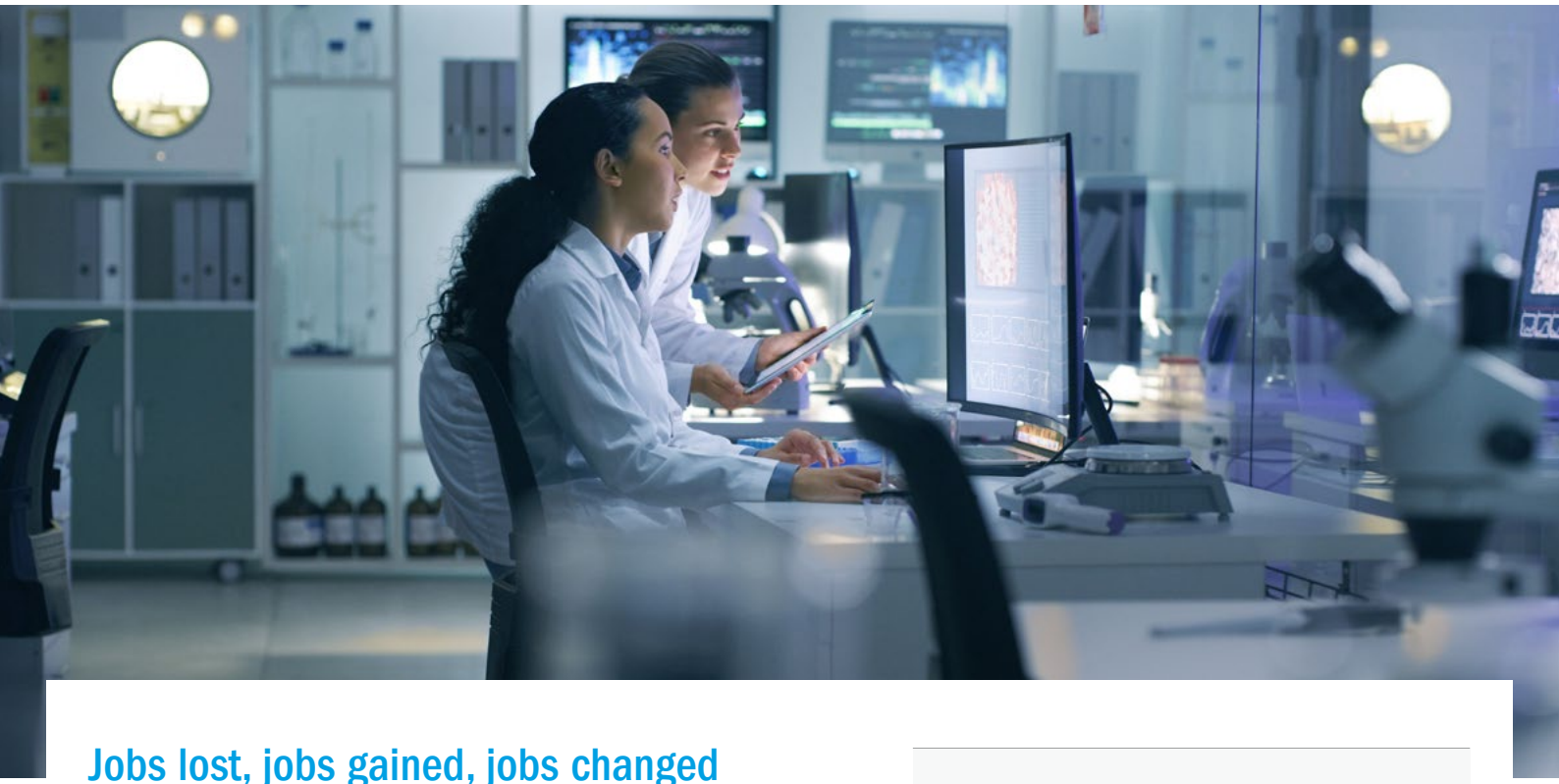
In this Thematic Insight we focus on "substitution" – that is the opportunities firms have to substitute human capital for automation, digitalisation and, increasingly, artificial intelligence (see Definitions box) to help lower operating costs, increase productivity and/or to address talent and skills shortages.

Figure 1: the Five 'S' framework of human capital



Source: Columbia Threadneedle Investments, 2023

[1] Read more in our previous viewpoint Managing the human capital transition, August 2023 https://www.columbiathreadneedle.co.uk/en/inst/insights/thematic-insight-managing-the-human-capital-transition/



Jobs lost, jobs gained, jobs changed

Just as the world of work was getting back on a more familiar footing following the seismic impact of the Covid-19 pandemic, along came the emergence of generative AI with the potential to further disrupt labour markets – including the companies in which Columbia Threadneedle invests.

According to a report by Goldman Sachs, generative AI could "expose" the equivalent of 300 million jobs globally to automation.[2] While there are very few occupations – perhaps less than 5% – which are fully automatable, six out of 10 could have around 30% of activities automated.[3]

Clerical and administrative jobs are the most exposed to technological advancement. In fact, we have already seen IBM[4] and BT[5] announce they will reduce back office and customer service roles and replace them with technology including AI. On the flip side, demand from a broad range of industries for software developers and cybersecurity specialists is increasing significantly.[6]

The quantum of global jobs lost through firms substituting labour for new technologies, or indeed created by firms finding new ways of manufacturing goods and services, is unknown. What is apparent, however, is that a significant number of jobs done today will change.

[2] Goldman Sachs: The potentially Large Effects of Artificial Intelligence on Economic Growth (Briggs/Kodnani), 26 March 2023
[3] McKinsey & Company, Jobs lost, jobs gained: workforce transitions in a time of automation, December 2017
[4] Techmonitor, IBM could replace 7,800 back-office workers with AI, 2 May 2023
[5] BBC, BT to cut 55,000 jobs with up to a fifth replaced by AI, 18 May 2023
[6] Dice.com, Dice Reports Strong Tech Hiring Results Across Key Industry Sectors, 8 August 2023

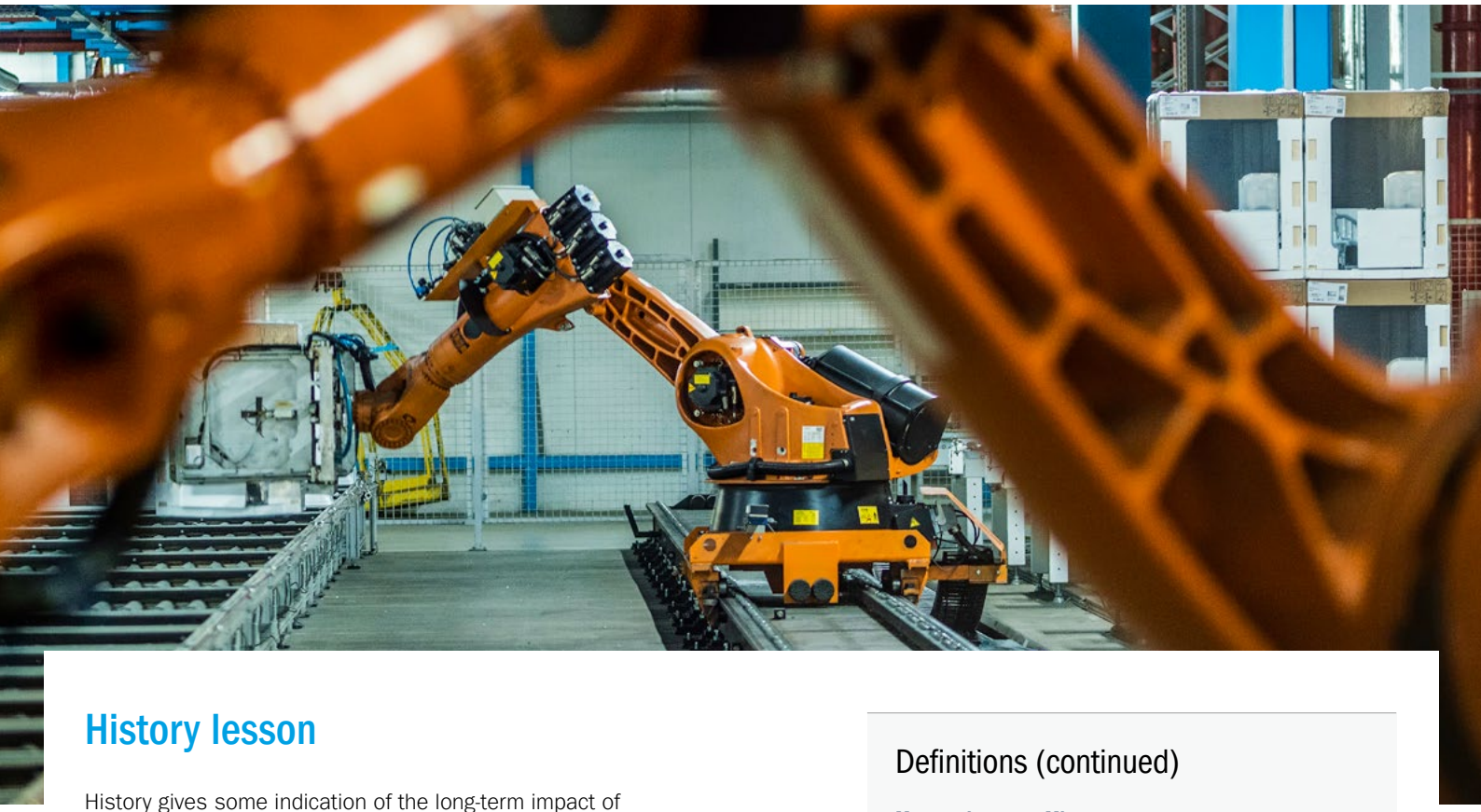
Definitions

Automation
Automation is a type of software that follows pre-programmed rules. It is the application of technology, programs, robotics or processes to achieve outcomes with minimal human input. There are different types of automation including "basic", "process" and "intelligent" automation. The latter incorporates AI and machine learning capabilities, allowing machines to "learn" and take better decisions and actions based on data from situations it has previously encountered and analysed. An example would be a virtual customer assistant.[7]

Digitisation and digitalisation
Digitisation refers to taking analogue information and converting it into a digital format.[8] Digitalisation is the use of digital technologies to change a business model and potentially provide new revenue opportunities.[9]

Artificial intelligence (AI)
AI is the broad field which refers to the use of technologies to build machines and computers with the ability to mimic cognitive functions associated with human intelligence. These include being able to see, understand and respond to spoken or written language, analyse data and make recommendations, and more. It is a set of technologies implemented in a system to enable it to reason, learn and act to solve a complex problem. Common applications include chatbots to replace customer service on numerous company websites and face recognition on smart phones.

[7] IBM, https://www.ibm.com/topics/automation
[8] Forbes: Digitization, Digitalization, And Digital Transformation: Confuse Them At Your Peril, 29 April 2018
[9] Forbes: Digitization, Digitalization, And Digital Transformation: Confuse Them At Your Peril, 29 April 2018



History lesson

History gives some indication of the long-term impact of technological advancement – be it Henry Ford's automobile assembly line of the 1900s[10] or more recently the introduction of personal computers in the 1970s.[11] Firms have adapted to new technologies, improved productivity and revenues, and created new roles for humans to do. Indeed, despite the technological advancements of the past century many advanced economies are currently experiencing near full employment.[12]

What is potentially different this time is the breadth of the impact of technological advancements across a spectrum of roles[13] and across the many sectors in which Columbia Threadneedle invests, including healthcare, legal services, consumer, media, manufacturing and education. New technologies including generative AI have the potential to automate repetitive and routine tasks and free up employees' time to focus on more complex and creative tasks.[14]

To maximise the opportunities AI and automation can provide, companies will not only need to invest in technology but manage their human capital effectively – reskilling and retraining existing employees, and promoting strong labour relations and supportive cultures. Alongside this they will need to attract new employees with distinct skillsets from their traditional hires.

[10] Ford, The moving assembly line and the five-dollar workday, 2023
[11] McKinsey & Company, Jobs lost, jobs gained: workforce transitions in a time of automation, December 2017
[12] UN, World Economic Situation and Prospects: October 2023 Briefing, No. 176, 2 October 2023
[13] McKinsey & Company, Jobs lost, jobs gained: workforce transitions in a time of automation, December 2017
[14] LinkedIn, Revolutionizing the Workplace: How Generative AI, Including ChatGPT, is Changing the Workforce and Boosting Efficiency, 10 July 2023

Definitions (continued)

Machine Learning (ML)
ML is a subset of AI that automatically enables a machine or system to learn and improve from experience. Instead of explicit programming, ML uses algorithms to analyse large amounts of data, learn from the insights, and make informed decisions. ML algorithms improve over time as they are trained – that is, exposed to more data. ML models are the output, or what the programmes learn from running the algorithm on training data. The more data used, the better the model will get.

ML is a discipline of AI that provides machines with the capacity to automatically learn from data and previous experiences. They do this by identifying patterns to generate predictions for new processes with minimal human intervention. ML is applied in several situations where it is impossible to apply strict algorithms.

Common applications of ML include image recognition used in healthcare settings which can support the detection of anomalies; e-commerce product recommendations; the detection of spam emails; and, despite the name, algorithmic trading.

Generative AI
Generative AI is an advanced branch of AI that utilises machine learning techniques to generate original content such as images, text, audio and video. Unlike traditional ML, which focuses on mapping input to output, generative models aim to produce novel and realistic outputs based on the patterns and information present in the training data. Dall-E or Chat GPT-4 are examples of generative AI.

Figure 2: potential areas of adoption of AI in healthcare

Source: Ideagen, The UK's new approach to regulating artifical intelligence in healthcare, August 2021

AI sector opportunities and the implications for human capital management

Healthcare: supporting an ageing population and talent shortage

AI is already incorporated in healthcare products and services such as imaging and diagnostics, assisting with surgeries, drug development and supporting operational efficiency in hospitals. This is beneficial to a global health system under considerable pressure due to ageing populations and constraints to government spending. Wider adoption of AI (Figure 2) has the potential to reshape the sector by improving patient outcomes and driving efficiency gains. It is estimated it could lead to savings of 5%-10% in US healthcare spending (roughly $200 billion–$360 billion annually.[15]

However, talent shortages persist across the broad range of healthcare practitioners from healthcare assistants to biopharma lab technicians. According to LabioTech, in the biopharma sector alone there are in excess of 800,000 employees but more than 60,000 job vacancies, which indicates a labour shortage of approximately 8%.[16] Projections show that job opportunities in the life, physical and social sciences sectors will grow by 7% by 2028.[17] While AI may mitigate some of these shortages – virtual wards can support some aspects of remote healthcare provision – the role of labour within hospitals and within R&D will remain prominent. Shortages will need to be addressed for companies to meet their growth strategies.

Columbia Threadneedle will engage with healthcare companies in understanding their approaches to talent management and seek to understand how they are planning to manage the risks associated with AI within healthcare – for example, around data breaches.

Projections show that job opportunities in the life, physical and social sciences sectors will grow by 7% by 2028

[15] Healthcare Dive, Artificial intelligence could save healthcare industry $360B a year, 26 January 2023
[16] PharmExec.com, Recruiting and Retaining Talent Is the Biggest Challenge Facing the Pharmaceutical Industry, 16 June 2022
[17] LabioTech EU, Tackling the skilled labor shortage in biopharma manufacturing, 27 September 2023

Utilities: powering the future

Utility companies are vital to global economies, generating, transmitting and distributing the gas, electricity and water required to run businesses and households. However, the transformation required by these firms as the world shifts to a more sustainable energy system will be significant.

To support the transition to a net zero world, utility companies are looking to technology to improve efficiency, reduce costs and enhance service delivery. Drones can support defect detection and predictive maintenance in pipes, wiring or machinery; AI can enhance the consumer experience by offering dynamic lower prices when there is excess capacity; and generative AI could help tackle the challenge of integrating variable and unpredictable renewable assets into the energy generation mix through analysis of weather patterns and scenario analysis.

However, building these capabilities in the breadth and depth required by utility companies will involve significant talent acquisition and reskilling of workforces. At the Columbia Threadneedle Investment Energy Transition Conference in May 2023, one of the consistent themes from companies critical to the energy transition was labour as a pinch point, particularly in relation to grid modernisation.[18] This could have implications around, for example, the potential of electric vehicles and heat pumps to help decarbonise the planet.

Columbia Threadneedle will continue to engage with firms which are key in decarbonising the energy system to better understand their talent management processes, as well as the opportunities they are exploring in new technologies to help the transition.

Catering companies: increased efficiencies and managing recruitment challenges

Catering companies are labour intensive businesses. Last year, Compass reported that it recruited 110,000 individuals in North America alone.[19] Labour as a percentage of revenue for the two largest catering companies in Europe, Sodexo and Compass Group, are around 47% and 49% respectively,[20] while voluntary turnover of staff is high at 29%[21] and 35%.[22] Both companies are experiencing strong demand as firms look to outsource their culinary staff offerings to focus on their core business, which is putting further pressure on staffing demands in tight labour markets.

While the need for onsite human employees will persist, Compass and Sodexo are both focused on improving efficiencies and investigating opportunities around automation to mitigate some of the labour supply pressures they are facing globally. Examples from Compass include the North Bar Tap + Go frictionless kiosk at Leicester City Football Club,[23] which removes the need for cashiers, and fully robotic kitchens – van-sized kitchens offering fresh meals 24-7 – in a healthcare setting.[24]

Catering companies are also using AI to leverage their data across their operations. AI technologies have allowed catering companies to better predict peaks in customer footfall, are used within CRM software to direct sales efforts towards the most valuable opportunities and help digitalise financial operations and administrative tasks. All of which have improved productivity and helped manage costs.

Going forward, generative AI may support sales teams communicate with potential clients and promote ways to upsell to existing clients. Generative AI may also help design the most efficient layouts of canteens and create pitch documents.

Columbia Threadneedle will continue to engage with catering companies to better understand the opportunities generative AI, automation and other technologies can offer to offset the risks inherent in a labour-intensive business. Likewise, we will explore the potential risks of generative AI on those sectors which use catering companies to provide food services, such as higher education settings.

[18] Columbia Threadneedle Investments, The energy transition – transformative on a global scale, August 2023
[19] Compass Group Careers, https://www.compassgroupcareers.com/about-us/our-companies/, 2022
[20] Columbia Threadneedle Investments' analysis, 2023
[21] Bloomberg/Sodexo Fiscal 2022 Universal Registration Document, 2022
[22] Compass Group, GRI Index 2022, 2023
[23] LCFC, King Power Stadium First in Europe To Introduce Frictionless Kiosk, 6 August 2022
[24] Food On Demand, Compass Group, Rowok announces 3-Location Robotics Pilot, 20 July 2022

Engagement case study:
Relx[25] – risk or revenue opportunity?

Background

The release in November 2022 of ChatGPT, a large language model owned by OpenAI and the fastest platform to a million users,[26] raised market concerns regarding the possible impact of the technology on sectors most exposed to it.

Engagement

As part of our regular engagement with senior management teams, Columbia Threadneedle Investments met with European-based global business information services firm Relx. It provides information-based analytics and decision-making tools to help clients, such as those in insurance, legal or medical, to manage risks.

We wanted to understand how management saw the perceived risks and opportunities associated with generative AI, and how the company would ensure it has the appropriate human capital strategy, such as skilled labour, to deal with this transition.

Management outlined how their businesses have been using AI for more than a decade to support clients in analysing and making decisions. Insightfully, management believe it is not just access to the tech itself that gives the company a competitive edge, rather the proprietary data set and deep customer knowledge. As they put it, "the power is having all three".

The CEO explained that while some of the data they use is publicly available, it has been collected over decades and often first hand (transcribing from within court houses) before being checked, stored and formatted in a searchable way in their own databases. This data is then overlayed with expert opinion and classified and mixed with proprietary data. The resulting database is, they conclude, fully proprietary. To replicate it would be extremely difficult, time-consuming and expensive.

Relx are not complacent, however, and are exploring ways they can improve their offering using generative AI. They have a product in trial that can respond to more conversational question searches, summarise cases and create draft client letters. They are also experimenting with numerous LLM models and see generative AI as an incremental positive for their long-term growth strategy rather than a significant threat.

In relation to human capital and attracting talent, Relx believe that the most important element of human capital is motivating staff through the "purpose" of the company – Relx products help their clients: they improve scientific study or medical outcomes, improve point of law and prevent fraud – this resonates with employees, and they are able to attract and retain good staff.

[25] The mention of specific companies is not a recommendation
[26] Reuters, ChatGPT sets record for fastest-growing user base, February 2023

Conclusion

Columbia Threadneedle will continue to assess the impact of AI and other substitution opportunities on the growth strategies of the firms we invest in. Using the Five S framework we will also evaluate the associated implications for firms' human capital management.

Get to know the author

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Sally joined Columbia Threadneedle Investments in 2023. As part of the global research team she undertakes thematic research, engages with companies, and collaborates with investment teams on the risks and opportunities arising from the transition in human capital. She previously worked as an equity research analyst and an industry policy lead for responsible investment regulation and legislation. Sally studied at the University of Warwick (BSc Economics) and gained the CFA charter in 2003.

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