

The next transformative technology?

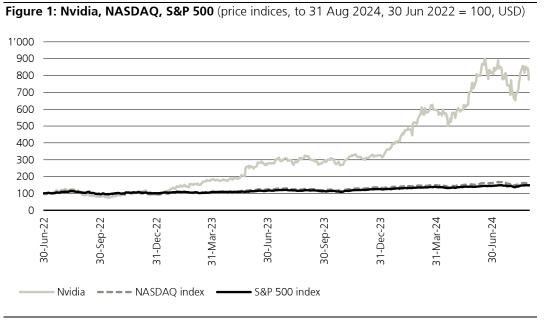
Artificial Intelligence (AI): what was once just a buzzword, is now reshaping industries and creating an environment ripe with investment opportunities. This transformative force is driving efficiency and innovation across industries and sectors, including real estate.

We think AI has the potential to enhance investment processes and add diversity to investment strategies. Asset managers who strategically integrate AI into their operations can gain a competitive edge, and risk falling behind if they don't.

A technology with great potential

Al has the potential to reshape the real estate sector. It can improve the investment process and enhance the asset and property management functions. We also expect Al to create attractive real estate investment opportunities and allow investors to access new markets. In this report we will focus on Al's potential impact on investment, but also look at some of its other impacts on the real estate sector.

Al may be the next transformative technology, and although its potential has been increasing for years, the more recent expansion of accessible tools such as ChatGPT have made it mainstream. The potential for Al has helped push equity valuations higher. For example, Nvidia, a US chipmaker, reached a USD 3 trillion valuation in June 2024, jostling with Apple and Microsoft to be the most valuable company in the world. The company more than tripled in value in a year and has far outpaced the wider market (see Figure 1). However, since then, the shares plunged by 23% in six weeks from 18 June 2024, clipping USD 784 billion from the company's market value and moving it into third place among the largest firms. The pullback reflected fears over the US economy and weaker earnings results from the large tech companies, with traders seeking to cash in on some gains. Even accounting for the decline, Nvidia shares had still more than doubled since the start of 2024.

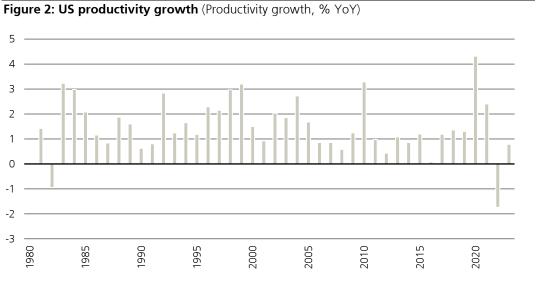


Source: Refinitiv Datastream; UBS Asset Management, Real Estate & Private Markets (REPM), August 2024. **Past performance is not a guarantee for future results.**

The performance of Nvidia is an indication of just how much growth potential the market thinks AI has. The scope to use AI chips in home PCs has further boosted expectations and the AI boom has fueled global stock market gains. More recently, there has been market anxiety and concerns over AI's impact and its ability to deliver the widespread gains predicted. However, we still think that AI has the potential to have a significant and wide-ranging impact, though there is uncertainty over the exact quantum and nature of this.

In the broad sense, AI refers to the use of machine learning and deep learning algorithms to study data to predict future behavior or trends, mimicking some human cognitive functions. The breakthrough in generative AI algorithms is that they can now learn from patterns in existing data to generate new content, designs and solutions. It is hoped that AI will have a major impact on the economy as its further integration into the jobs market will help to enhance overall productivity. It could mirror the period running up to the millennium when more widespread use of computing saw strong productivity growth (see Figure 2).

In the US, Oxford Economics expects the use of generative AI to assist and automate workplace tasks and boost annual GDP 2.9% by 2032. The productivity of the overall US workforce is expected to rise by more than 10% over the same time period. Hence, generative AI has the potential to significantly raise the outlook for GDP growth in the US and other countries too. However, it will also likely result in some workers being displaced.



Source: Oxford Economics; UBS Asset Management, Real Estate & Private Markets (REPM), March 2024.

Despite the prediction that AI will help enhance productivity, the key questions are which jobs are at risk of being displaced and which ones will be enhanced by AI. This has important implications for the real estate sector. On the one hand, productivity enhancing AI can boost overall job numbers if innovation spurs a sector and causes demand to grow in excess of the productivity gains delivered by AI. On the other hand, if output is static, productivity advances can see the same amount of output produced with fewer hours from people required.

According to the IMF, about 40% of jobs globally are exposed to Al.¹ The advanced economies are at greatest risk, with 60% of their jobs exposed due to a prevalence of cognitive, task-oriented roles. In addition, the OECD predicts that across its member states, 28% of jobs are in occupations at high risk of automation.² Al also has the potential to work with robotics and can improve manufacturing processes.

Companies may utilize algorithms to complete tasks, resulting in a lack of human touch behind the work. This could also have a knock-on effect in the future if the workload of junior staff becomes more automated and they lack the training and development needed to progress into senior roles, creating a widening skills gap.

However, we currently see many AI service providers making the more conscious decision to explore a human-centric approach assisted by AI 'co-pilot' products, rather than 'auto-pilot' products which aim to entirely replace human roles. For example, Microsoft reported that more than 27,000 organizations are incorporating its Microsoft GitHub Copilot AI platform into their businesses to increase the productivity of software developers.³

Technological advances can have a non-disruptive impact on the economy and generate employment rather than displace jobs. For example, a recent MIT study found that 60% of today's jobs did not exist in 1940 and were brought about by technological advances. For example, jobs in the aviation industry.⁴

Hence AI is likely to augment jobs rather than replace human workers, and can often enhance their jobs. Simple process-driven elements of roles have the greatest scope to be automated, leaving workers to focus on higher value-add activities and boosting overall productivity.

To summarize, there are three main impacts that Al could have on jobs: disrupt, augment or create. The disruption includes roles that could be fully or partially automated. Augment allows tasks to add new capabilities and efficiencies to existing roles. And Al can create jobs such as developing, implementing and servicing Al.

Al as a technology is still in its early phases and will likely impact the economy in ways not yet envisaged. The wide range of outcomes means there is significant uncertainty about the future of Al and its impact on the labor market. The downside is greater structural unemployment due to job displacement, while the upside is net job creation and productivity enhancements. The overall impact will vary by sector, however, the office sector will likely be impacted most. We will discuss this in more detail later.

Source:

¹ Gen-Al: Artificial Intelligence and the Future of Work, IMF, 2024

² What skills and abilities can automation technologies replicate and what does it mean for workers?, OECD, 2022

³ Microsoft 2023 Annual Report

⁴ New Frontiers: The Origins and Content of New Work, 1940–2018, David Autor, Caroline Chin, Anna Salomons, Bryan Seegmiller, 2022



Al and real estate investment

Ultimately, real estate values are determined by the income that assets generate, its expected growth trajectory and the discount rate applied to those income streams. The discount rate in turn is determined by market interest rates and the risk premium applied, which in itself relates to the risk and volatility of expected income flows. Properties which generate outsized income growth compared to expectations will tend to generate higher returns than expected. This is what happened to the logistics sector when retail rotated online. This resulted in very strong demand for logistics facilities which drove strong rental growth and pushed valuations sharply higher, and by more than expected. Hence, when assessing real estate investment opportunities which might arise from AI, we should focus on the impact on the overall demand for space from occupiers, the ability of occupiers to pay rents and any impact on the volatility of income flows and risks associated with them. Finally, we also need to consider how responsive supply is.

From another perspective, as AI helps to improve productivity and boost economic growth, some consumers will be subject to a wealth effect. For example, there could be some increased travel and consumer spending, providing a boost to demand for the hospitality and retail sectors. It could also impact the residential sector if households have more income available to spend on rent or mortgage payments.

Data centers – the engine room of Al

Data centers are the engine room of AI and the most obvious investment opportunity arising from the widespread adoption of the technology. As companies incorporate AI into their businesses, they will require more computing power, cloud-based data and data center capacity. As such, data centers and towers present both short-term, potentially higher returning development opportunities, and also longer-term opportunities to acquire stabilized assets.

Data centers were already experiencing a positive growth trend prior to the rapid adoption of AI, but this is now being fueled by the take-up of the technology. For example, the annual datasphere, which measures the amount of new data created globally, is expected to double as soon as 2027 and indicates strong growth in demand for data centers ahead (see Figure 3).

Figure 3: Annual size of global datasphere (2010 to 2027, zettabytes, level values)

Source: IDC; UBS Asset Management, Real Estate & Private Markets (REPM), January 2024

Revenue from generative AI software is expected to grow by 58% p.a. from 2023 to 2028 according to S&P Market Intelligence. This growth is driven by computing requirements from cloud service providers and social media platforms; and corporate enterprises across the automotive, financial services, health care and telecoms industries. Cloud service providers present a growing revenue opportunity and are witnessing an acceleration in capital expenditures to reap the rewards of AI.

A reliable, uninterrupted power supply is a key requirement for data center sites. However, Al workloads require significantly more computing power than non-Al applications, and hence can absorb a significant amount of the power available across major data center markets. As such, data center developers and owners need to be able to secure sizable and sustainable sources of power, which can be a constraint on development. As a result, end-users which have large Al workloads may choose newer facilities with more power available.

Limited supply and rising demand have led to falling vacancy rates and are exerting upward pressure on data center rents (see Figure 4). Al and machine learning requirements are drivers of demand and data centers witnessed record levels of take-up in 2023 according to JLL. There were 352 MW of take-up recorded across the core markets in Europe, up 19% YoY. Frankfurt has dominated European take-up, with a third of all demand in the core European markets monitored.

JLL predicts that in 2024, take-up will increase by 15% from the record level seen in 2023 for core European markets, including Frankfurt, Dublin, London, Amsterdam and Paris, with London forecast to see a significant uptick. Will the supply of data centers be able to keep up with growing demand amid the power and planning constraints which restrict data center development? Restrictions in new supply could create favorable demand dynamics and support further rental growth and drive strong investment performance.

Figure 4: North America data center rental growth (2014 to 2023, % YoY)

Source: CBRE; UBS Asset Management, Real Estate & Private Markets (REPM), April 2024

On the investment transactions side, according to JLL USD 2.34 billion was invested into EMEA data centers in 2023, more than double the USD 0.76 billion in 2022.

Other trends driving data flows include the growing role of cybersecurity, connectivity networks and hardware components. The surge in demand for Al-related hardware and software has had follow-on impacts for materials, labor and real estate. Digital infrastructure networks (5G, mobile and fiber networks) are also experiencing growth.

Al and offices

The impact of AI on the office sector will depend upon whether AI leads to job growth or job displacement and whether occupier demand will increase or decrease as a result. And this must be layered over the structural changes the sector is already seeing due to the impact of hybrid working. Moreover, different occupations will have different levels of exposure to generative AI, based on the task and expected rate of adoption.

Productivity enhancing AI should increase the profitability of corporates, and hence, their ability and willingness to pay higher rents. Similarly, sectors which see rising job numbers due to AI should see demand for space rise. By contrast, those sectors which are disrupted by AI and see profitability squeezed and workers displaced are most at risk of rental declines. This would be akin to the structural shocks which have impacted the retail and office markets in recent years.



Initially we expect there to be a greater focus on the automation of routine tasks, these would typically be back-office roles which easily lend themselves to Al. In many cases, corporates have outsourced these types of roles to lower cost locations such as India and Eastern Europe, hinting that the first wave of Al automation is less likely to impact core CBD locations in the advanced economies, while back-office hubs will likely be more exposed.

According to Oxford Economics, in the US office is the property sector most exposed to the impact of generative AI, followed by life sciences and manufacturing. These sectors will likely feel a negative impact on occupier demand. In the case of life sciences, productivity enhancements from AI need to be considered against overall growth in the sector. Office-using occupations have greater potential for generative AI to automate tasks and are likely to have a higher adoption rate. This adds to the headwinds that the global office sector is already facing from hybrid working, working age population decline and decarbonization-related capex.

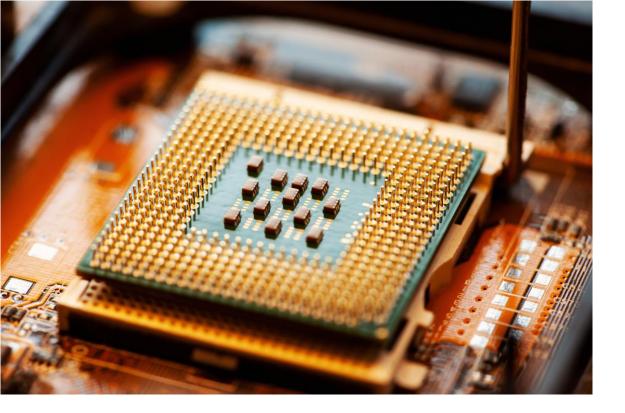
As the adoption of generative AI to assist and automate workplace tasks increases, some office workers will be displaced. By 2032, Oxford Economics estimates that over 9% of the current US workforce will be displaced by generative AI. The affected workers are predominantly in the office-using sectors such as information, professional, scientific and technical services. This will likely present a major headwind to future space demand for offices.

The US economy is one of the most dynamic in the world though and has successfully adopted and embraced change in the past. However, there will likely be short-term pain points. Around 80% of the workers expected to be displaced will likely find new roles, though the lag in time for workers to be re-employed hits productivity for the economy as a whole.⁵ Office and administrative support and sales roles are highly exposed to generative AI and likely to face frictions when trying to move to alternative positions.

On the positive side, not only will AI model developers such as OpenAI represent a growing occupier segment for offices, but so will companies involved in semi-conductor hardware, cloud computing platforms and application development which are also part of the AI ecosystem. According to Stanford University, in 2023, the area receiving the most AI investment globally was AI infrastructure/research/governance, followed by natural language processing (NLP) and customer support; data management and processing; and medical and healthcare.⁶ Furthermore, AI can improve the efficiency of sectors that are operationally intensive like healthcare, hotels and senior housing.

⁵ Oxford Economics, March 2024

⁶ Artificial Intelligence Index Report 2024, Stanford University



San Francisco and its Al Boom

San Francisco is at the center of the Al boom and is reaping the benefits from it, hosting a number of leading Al firms and tech talent. Indeed, the city has the most Al firms and tech talent in the world, being home to OpenAl, Anthropic, Databricks and Scale Al. According to JLL, 37% of Al companies are based in the US, 42% of which are concentrated in the San Fransisco Bay Area.

Pre-COVID, the city lacked investment and its desirability was falling. During the pandemic, tech employees worked from home, leaving the downtown area empty. However, more recently, as the AI boom has gathered pace, the proximity of Stanford and Berkley universities, two AI centers of excellence, has helped feed private sector AI innovation. This is a general trend which sees AI companies and investments cluster where AI talent is available, including around innovation centers and universities, creating a large pool of specialist talent.

Moreover, young people are being attracted to the city, wanting to be a part of this technological revolution. This is also creating demand for residential rental accommodation. Within the more desirable neighborhoods of San Francisco, competition for rental properties is fierce. The city's population is still growing and the arrival of well-paid tech types has boosted house prices.

Hence, the arrival of AI can boost incomes and generate demand and investment opportunities in the residential sector. Indeed, according to Brookings Metro, in the twelve months to July 2023 San Francisco accounted for 13% of generative AI job postings in the US.⁷ According to official data for 2022, San Franciscans' average personal income per year was more than twice the US average.

The San Francisco metro area alone accounts for more than a quarter of venture capital investment in the US (see Figure 5), while the Bay Area more broadly, including the San Jose metros, makes up more than a third of the national total. The biggest five metros account for 67.5% of venture capital funding in the US. This highlights the scale of investment into the industry.

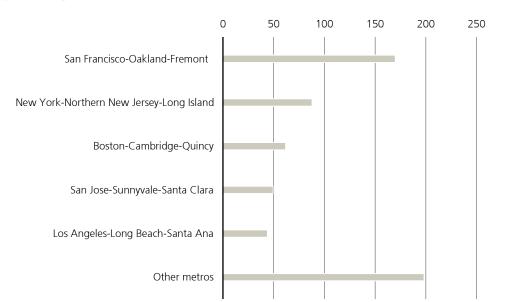


Figure 5: Top US metro areas for VC investment (2019 to 2021, USD billions)

Source: PitchBook; UBS Asset Management, Real Estate & Private Markets (REPM), May 2024

The office market in San Francisco lost momentum during the run-up to the pandemic, but AI has breathed new life into it. According to Savills, AI companies leased almost 1 million square feet of San Francisco office space between 2020 and the end of 2023.8 However, office space available in San Francisco remains high, with vacancy of 25% as of mid-2024, according to CBRE.9 Moreover, according to Savills around 30% of existing leases are due to expire by the end of 2025, and unlikely to be renewed unless rental rates are reduced.

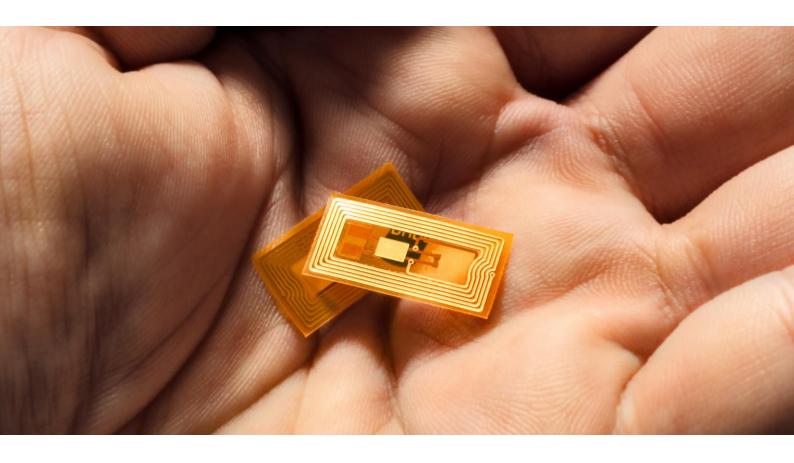
Within Europe, London can be classified as the Al capital. According to Digital Catapult, more than 70% of UK Al companies are based in London. ¹⁰ Moreover, the number of new Al companies choosing London as their base is increasing, attracted by its world leading universities, which offer an exceptional talent pool. Several high-profile Al firms have already made significant investment into London including OpenAl, DeepMind and Tessian.

⁷ Brookings Metro, October 2023

⁸ It will take more than the AI boom to shrink San Francisco's record-high and growing office availability, Savills, 2024

⁹ CBRE San Francisco Overview, 1Q24

¹⁰ Digital Future Index 2021-2022, Digital Catapult



Investment decision making and other AI applications

Within real estate investment AI tools already exist, including AI assisted forecasts and pricing models. However, historically real estate has been slow at adopting new technologies. The McKinsey Global Institute (MGI) believes that generative AI could generate USD 110–180 billion or more in value for the real estate industry. To incorporate AI and generative AI systems into real estate investing, companies can utilize existing foundation models for internal tasks such as GPT-4 or Microsoft Copilot. Additionally, companies can purchase off-the-shelf AI powered products and services.

A good example of Al being used as a 'co-pilot' is its potential to enhance and improve the real estate investment decision making process. With the ability to synthesize insights from unstructured data and write commentary, investment analysts can use Al to interpret and query large data sources to provide a more comprehensive understanding of properties and markets at breakneck speed. Al can also leverage predictive technology to forecast rental growth, assess market demographics and pull comparable properties. Investment committees may even see new Al committee members casting votes on transactions and helping to make investment decisions or Al computed investment strategies.

Al has many other uses in the investment process, including data standardization for portfolio analytics, while firms with large datasets could create customized benchmarks. Similar to data interpretation, Al can 'read' existing documents, like leases, to summarize key themes and variables and flag important terms like expected monthly rent, market forces, tables of information and present them in a standardized format for easy comparison. Al can help draft comprehensive market reports and quarterly fund reports or respond to routine data requests faster than a human.

Advanced property analysis can provide accurate and comprehensive information about properties to investors. It can utilize data from a variety of sources and analyze past transactions to help get a sense of which neighborhoods are primed for growth and which are headed for potential downturn. It can also analyze property owner behavior to help investors find distressed properties, off-market deals and opportunities for value creation. Al could also be used to value properties using a 'mass appraisal' focused on systematic and automatic analysis of broad databases and self-learning models.

Investors have large amounts of proprietary and third-party data on properties, communities, tenants and the market, which can be used to customize existing generative Al tools that can, in turn, perform real estate tasks. These tools could identify opportunities for investors at lightening speed, revolutionize building and interior design, create marketing materials and facilitate customer journeys.

Al can also be used as a tool for predicting demand and managing rental income streams for properties. By analyzing rental rate data, Al can help predict optimal unit pricing using real-time data, particularly for residential assets which typically have shorter leases. Future possible applications include real-time tenant credit analysis, market data trends, adaptation of floorplates and amenity spaces to tenant demand and automated valuation models.

Alternative data such as mobile data, package flows and market-based amenity demand can also be added to traditional underwriting models. The integration of AI has the potential to create more efficient operating models, a stronger customer experience, tenant retention, new revenue streams and smarter asset selection. Generative AI can also be used in other ways such as for virtual reality tours of properties to allow the visualization of desired furnishings. Furthermore, it can be used for creative content including images.

In terms of managing properties, Al has the potential to create greater efficiency for real estate, including the ability to better manage property operations, such as through energy management. Al can help drive down costs and improve property performance and efficiency. In terms of asset management, generative Al can help collect and analyze property-level data more effectively, which should lead to enhanced budgeting and forecasting.

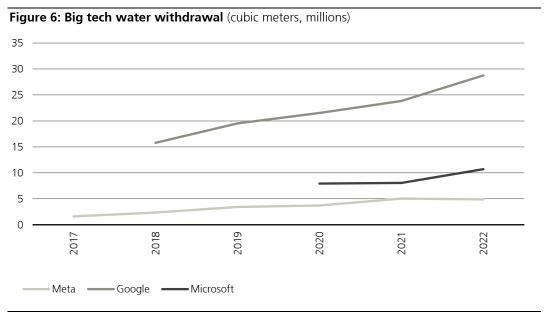
The companies which are first to implement AI into their real estate management will benefit from greater operational efficiencies. This should give them an edge over competitors, allowing them to improve their operational margins and profits, and charge lower management fees.

No matter the application, for the foreseeable future, firms will still need people to review Al output before it is released or relied upon for decision-making, but Al can play a significant role in speeding up the process and improving the breadth and quality of the analytics.

Sustainability factors

Al and data centers create *thirsty* companies due to the vast amounts of water needed for running advanced Al models.¹¹ The large amounts of computing power used needs chilled water to cool equipment by absorbing heat from the air. Some of the water evaporates in the cooling process, while some can be reused.

In 2022, the latest period for which figures are available, Microsoft increased its water withdrawal (the amount of water removed from source) by 33% YoY and Google by 21% YoY, largely as a result of their growing use of data centers (see Figure 6). It is estimated that requesting between 10 and 50 responses from ChatGPT on the GPT-3 version equates to drinking a 500ml bottle of water, with later versions requiring more power and water.¹¹



Source: Google; Meta; Microsoft; UBS Asset Management, Real Estate & Private Markets (REPM), July 2024. Note: water withdrawal refers to water removed from source.

¹¹ Making AI Less "Thirsty": Uncovering and Addressing the Secret Water Footprint of AI Models, Pengfei Li, Jianyi Yang, Mohammad A. Islam, Shaolei Ren, 2023

The computing power used when running AI also consumes significant amounts of energy. For example, according Ami Badani, Chief Marketing Officer of Arm Holdings, a chip design firm, ChatGPT requires 15 times more energy than a traditional web search. She highlighted that AI not only impacts water consumption but also energy consumption. According to the International Energy Agency's (IEA) analysis of electricity consumption by data centers, AI and the cryptocurrency sector could double between 2022 and 2026. It could rise from an estimated 460 TWh in 2022 to more than 1,000 TWh in 2026. According to the IEA, this is roughly equivalent to Japan's current total consumption.

Google's total planet-warming emissions in 2023 were 48% higher than in 2019. ¹³ The company attributed the spike to data center energy consumption and rapid advances in the demand for Al. However, Google stated that its data centers are 1.8 times more energy efficient than a typical data center and is committed to using model optimization, efficient infrastructure and emission reduction to mitigate its environmental impact. It's a similar story for Microsoft which, largely due to its Al activities and construction of data centers, saw its emissions 30% higher in 2023 compared to 2020, even though the firm aims to be carbon negative by 2030. Hence, we believe widespread use of Al is set to drive up energy use.

Not only does AI pose environmental concerns but it can also have social impacts through job displacement. According to the IMF, on a new measure of potential AI complementarity, out of the 60% of jobs exposed to AI in the advanced economies about half may be negatively affected by AI; the rest could benefit from enhanced productivity through the integration of AI.¹⁴ Moreover, although the share of jobs exposed to AI is less in emerging markets and developing economies, they are also less ready to reap the benefits of AI. The IMF notes that this could exacerbate the digital divide and cross-country income disparity. Within countries, AI will likely impact income and wealth inequality, as the technology tends to be complimentary to the jobs of higher-wage earners, who can expect a more-than-proportional increase in their labor income.

Within the real estate sector, Al technology can help to improve energy efficiency in buildings and deliver net-zero buildings. Al can be integrated into the design phase of buildings, while predictive maintenance algorithms can extend the lifespan of critical building infrastructure and ensure it operates efficiently, reducing the need for resource-intensive replacements. This can include managing building energy consumption in real time and adapting to occupancy and external environmental conditions. This not only reduces energy costs but can also significantly cut carbon emissions.

Al can also assist in the prediction of environmental transition risk. The World Wildlife Fund has commissioned a tool that utilizes Al, specifically NLP. The tool automates the assessment of companies' disclosures of transition plans to help reduce inconsistencies and the risk of greenwashing, which has occurred due to the lack of one clear reference framework. This tool highlights the use of Al and machine learning in sustainable finance and how it can help investors assess transition risk and help support companies' disclosure efforts.

¹² Electricity analysis and forecast, IEA, 2024

¹³ Note: total greenhouse gas (GHG) emissions, scopes 1, 2 and 3

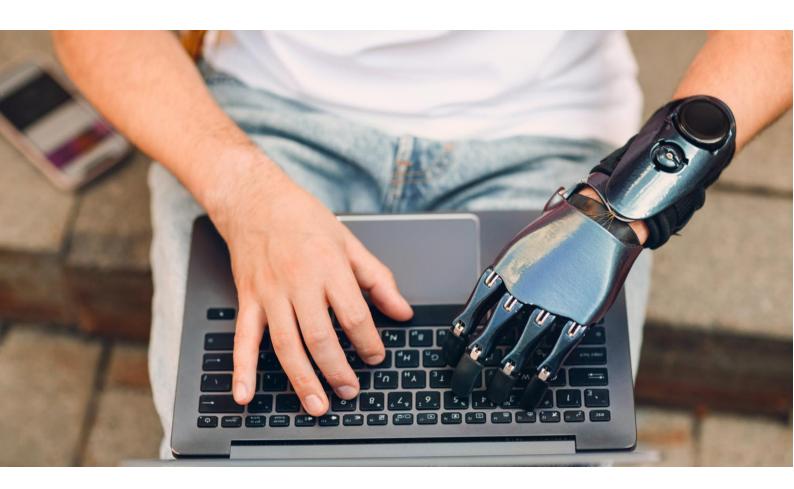
¹⁴ Gen-Al: Artificial Intelligence and the Future of Work, IMF, 2024

Investment opportunities and transformation of the real estate sector

Overall, we think that AI will have a significant impact on real estate, presenting investment opportunities and changing the ways in which the sector works.

This transformative technology is expected to positively impact the economy and labor market, though some jobs will likely be displaced. The impact on job growth will influence occupier demand and offices in particular. We expect strong growth and long-term investment opportunities in data centers.

Al will also provide opportunities within the real estate investment process to help improve efficiency, performance and analysis. In addition, we think that Al can enhance the sustainability of real estate by reducing energy consumption and carbon emissions. However, this needs to be considered in the context of the significant energy and water consumption requirements of running Al models.



For more information, please contact:

UBS Asset Management

Real Estate & Private Markets (REPM) Research & Strategy

Jaipreet Bains Fergus Hicks

sh-am-private-markets-research@ubs.com



Follow us on LinkedIn

To visit our research platform, scan me!



www.ubs.com/realestate

This publication is not to be construed as a solicitation of an offer to buy or sell any securities or other financial instruments relating to UBS Asset Management Switzerland AG or its affiliates in Switzerland, the United States or any other jurisdiction. UBS specifically prohibits the redistribution or reproduction of this material in whole or in part without the prior written permission of UBS and UBS accepts no liability whatsoever for the actions of third parties in this respect. The information and opinions contained in this document have been compiled or arrived at based upon information obtained from sources believed to be reliable and in good faith but no responsibility is accepted for any errors or omissions. All such information and opinions are subject to change without notice. Please note that past performance is not a guide to the future. With investments in real estate / infrastructure / food and agriculture / private equity / private credit (via direct investment, closed- or open-end funds) the underlying assets are illiquid, and valuation is a matter of judgment by a valuer. The value of investments and the income from them may go down as well as up and investors may not get back the original amount invested. Any market or investment views expressed are not intended to be investment research. The document has not been prepared in line with the requirements of any jurisdiction designed to promote the independence of investment research and is not subject to any prohibition on dealing ahead of the dissemination of investment research. The information contained in this document does not constitute a distribution, nor should it be considered a recommendation to purchase or sell any particular security or fund. A number of the comments in this document are considered forward-looking statements. Actual future results, however, may vary materially. The opinions expressed are a reflection of UBS Asset Management's best judgment at the time this document is compiled and any obligation to update or alter forward-looking statements as a result of new information, future events, or otherwise is disclaimed. Furthermore, these views are not intended to predict or guarantee the future performance of any individual security, asset class, markets generally, nor are they intended to predict the future performance of any UBS Asset Management account, portfolio or fund. Source for all data/charts, if not stated otherwise: UBS Asset Management, Real Estate & Private Markets. The views expressed are as of September 2024 and are a general guide to the views of UBS Asset Management, Real Estate & Private Markets. All information as at September 2024 unless stated otherwise. Published September 2024.

© UBS 2024. The key symbol and UBS are among the registered and unregistered trademarks of UBS. Other marks may be trademarks of their respective owners. All rights reserved.

Approved for global use.

