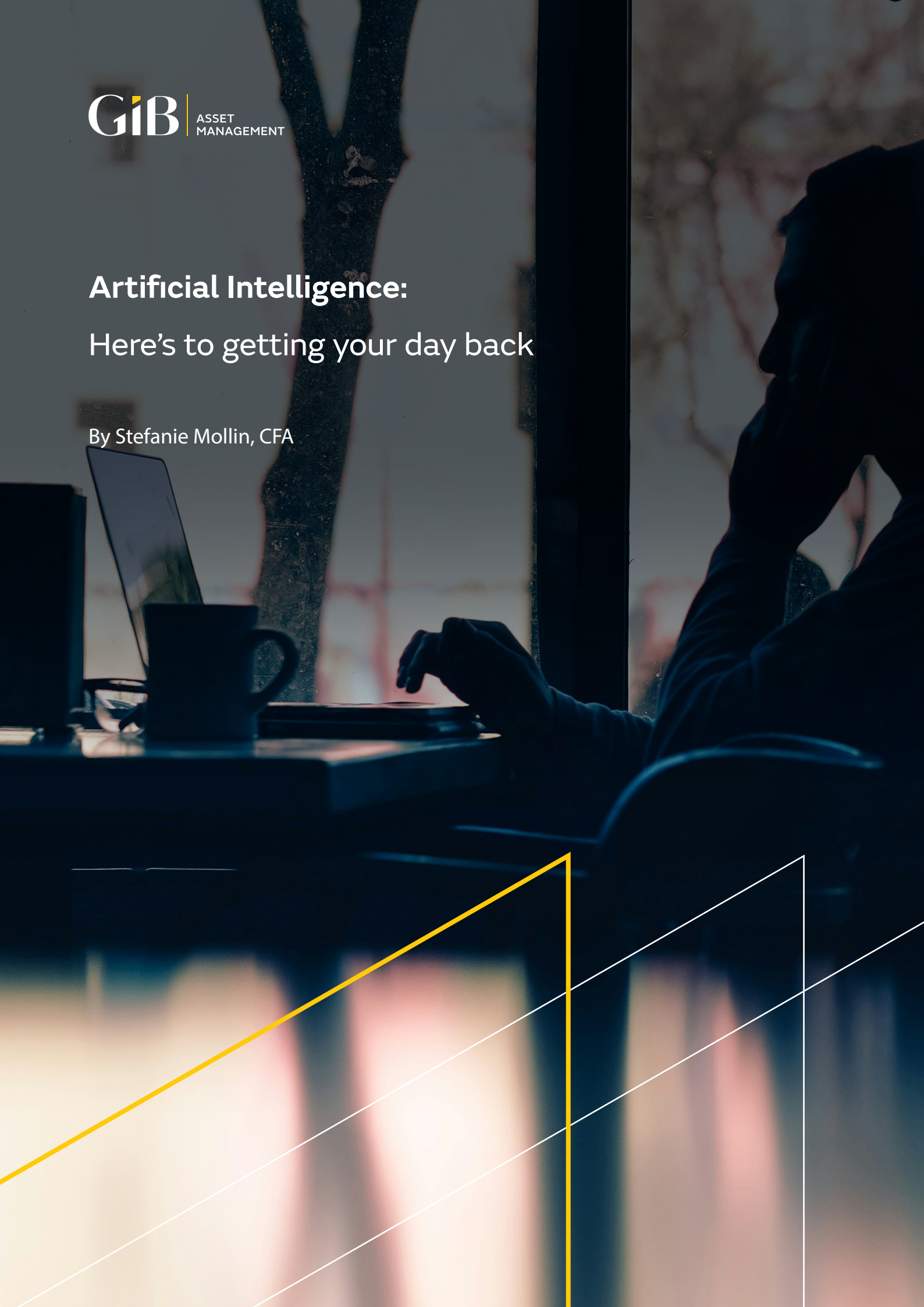


Artificial Intelligence: Here's to getting your day back

By Stefanie Mollin, CFA



Artificial Intelligence: Here's to getting your day back

“We tend to overestimate the impact of any new technology in the short run and underestimate it in the long run”

-Chia Hock Lai, Co-Founder, Global Fintech Institute

Executive Summary

- ▶ The GIB AM Sustainable World thematic investment process identifies Frontier Technology as an area of long-term growth potential
- ▶ The global Artificial Intelligence (AI) Chips market was valued at USD5.6bn in 2023 and is anticipated to reach USD50bn by 2030, witnessing a CAGR of 36% during the forecast period 2024-2030¹
- ▶ AI to drive margin expansion across multiple industries: AI already benefitting a wide range of companies from consumer staples to software companies
- ▶ Higher margins lead to superior RoIC and to share price outperformance: High operational efficiency companies have outperformed the MSCI World index by 60% since January 2021²
- ▶ AI efficiency gains are already being reported by portfolio holdings like Colgate and Microsoft and we believe will drive RoIC gains over the coming years

¹ Finance Journal-Global, Global Artificial Intelligence (AI) Chips Market Research Report 2024, Jan 2024.

² GIB AM Analysis & Bloomberg, 2024.



What is “Frontier Technology”?

By driving innovation and enhancing efficiency, advancements in computing, sophisticated AI models, and machine learning are already profoundly impacting businesses and society. As an investment team, we recognise that Frontier Technologies play a pivotal role in advancing the United Nations Sustainable Development Goals (SDGs). These cutting-edge technologies unlock new possibilities to address global challenges, ranging from revolutionising healthcare delivery (SDG 3: Health & Well-Being) to supporting e-learning tools that advance education (SDG 4: Quality Education). Additionally, AI-driven optimisation enhances resource allocation and reduces waste across sectors such as agriculture (SDG 2: Zero Hunger) and water management (SDG 6: Clean Water and Sanitation).

Furthermore, with increasing AI use, the demand for computing power (compute) will continue to grow exponentially and is fast becoming a global challenge.

Historically, Moore’s Law was used to forecast the growth of computing power to meet demand, with a doubling of transistor density leading to a doubling of processing power every two years, while power requirements remained constant. From around 2005, this relationship weakened, and a doubling of transistor density every two years was no longer translating into the same level of gains in speed and energy efficiency. Despite this slowing of computing power growth rates, demand for computing power continues to grow exponentially thanks to applications like machine learning and big data which require extra computing power. To meet this demand, GPUs (graphic processing units) have come to the rescue. Nvidia’s GPUs are quadrupling in speed every two years, surpassing the Moore’s Law relationship of a doubling of computing power every two years. Nvidia’s newly announced Blackwell B200 chip is 4x faster than the H100 (Sep 2022 launch), which was 4x faster than its predecessor (A100 launched in June 2020).³

Given these dynamics, it is estimated that the AI chip market will grow at a rate of 36% pa from 2024-2030.⁴ GPUs are expected to grow by 33% CAGR (2019-27) from \$20bn in 2019 to US\$200bn by 2027.⁵

Supercharged economic growth thanks to AI productivity gains

AI is expected to contribute an extra \$15.7trn (+15%) to global GDP by 2030 thanks to an additional 0.1-0.6% GDP growth from AI automation (see table below). There are around 1bn knowledge workers globally and if we assume they each earn \$15,000 pa on average (higher in developed markets and lower in emerging markets), then this would equate to ca\$15trn per annum for knowledge worker labour costs. Assuming a 15% efficiency improvement (on the low end of forecasts), then there could be a \$2.25tn annual savings, like the McKinsey AI economic study forecasts.⁶

Economic and general productivity gains from AI

PWC Study	AI is expected to contribute an additional \$15.7tr to the global economy by 2030, +15% from total \$105 nominal GDP in 2023. ⁷
McKinsey AI Economic Study	Generative AI will enable labour productivity growth of 0.1 to 0.6% annually through 2040, adding \$2.6 trillion to \$4.4 trillion annually to the global economy by 2040. Automate work activities that absorb 60-70% of employees’ time today. ⁸
MIT Study	Study of 453 college-educated professions show that ChatGPT raises the average productivity of those who used the technology and increased job satisfaction. Average time taken for a writing task decreased by 40% and output quality rose by 18%. ⁹
HBS Consultant Study	Study of 758 BCG consultants highlights GPT4 productivity gains...consultants using AI completed 12.2% more tasks on average, and 25.1% more quickly, and produced significantly higher quality results (more than 40% higher quality compared to a control group). ¹⁰
McKinsey Software Developer Study	Writing new code in nearly half the time. Optimising existing code (refactoring) take only two-thirds the time compared to traditional methods. ¹¹

³ Nvidia & GIB AM Analysis, 2024.

⁴ Artificial Intelligence (AI) Chips Market Research Insights 2024-2031: Pioneering Strategies Shaping the Future”, Finance Journal, February 2024.

⁵ Allied Market Research.

^{6&8} McKinsey, “The economic potential of generative AI: The next productivity frontier”, 14 July 2023.

⁷ PWC, Global Artificial Intelligence Study, “What’s the real value of AI for your business and how can you capitalise?”

⁹ Science, 13 Jul 2023, Vol 381, Issue 6654, Noy, Shakked and Zhang, Whitney, Department of Economics, MIT.

¹⁰ Dell’Acqua, Fabrizio, Edward McFowland III, Ethan Mollick, Hila Lifshitz-Assaf, Katherine C. Kellogg, Saran Rajendran, Lisa Krayer, François Candelon, and Karim R. Lakhani. “Navigating the Jagged Technological Frontier: Field Experimental Evidence of the Effects of AI on Knowledge Worker Productivity and Quality.” Harvard Business School Working Paper, No. 24-013, September 2023.

¹¹ McKinsey, “Unleashing developer productivity with generative AI”, June 2023, Begum Karaci Deniz, Chandra Gnanasambandam, Martin Harrysson, Alharith Hussin, and Shivam Srivastava, representing views from McKinsey Digital.



Chart 1: Productivity impact from automation by scenario, 2022-40, CAGR (%)¹²

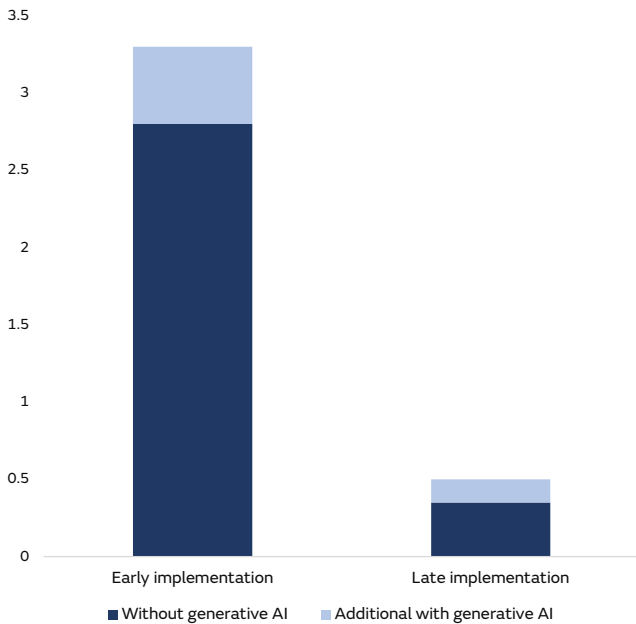
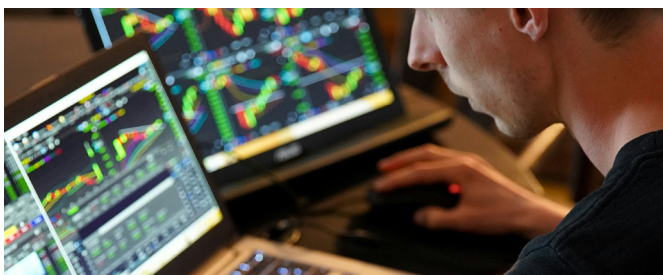


Chart 2: Top quartile RoIC companies outperform bottom quartile RoIC by 3x over 15 years¹³



AI efficiency gains leading to margin and RoIC expansion and share price outperformance

The growth of AI will not only lead to increased demand for more compute but will be used to increase efficiency within companies. At GIB AM we invest in high growth and quality companies. We believe that quality is encapsulated by high RoIC (Return on Invested Capital). **Top quartile RoIC companies outperformed bottom quartile RoIC companies by 3x over the past 15 years (see Chart 2).** Strong operational efficiency and high margins typically correlate with high RoIC. Thus, not surprisingly, companies that demonstrate high operational efficiency and high profit margins outperform on a relative basis. This should incentivise companies to invest in AI to drive future productivity.



GIB AM Sustainable World Fund portfolio holdings demonstrate sustainable RoIC expansion

Generative AI is expected to drive efficiency gains across the economy, and given the focus on high RoIC companies, GIB AM has invested in the companies targeting and benefitting from AI such as Colgate and Microsoft.

Colgate: CL has used traditional AI and machine learning to advance analytics by speeding up model/algorithm processing and reducing time for innovation ideation and testing. In the past two years, CL has achieved a +66% increase in AI analytics, a +65% increase in use case execution, and a +56% increase in change and culture, above external benchmarks. On Media Analytics, CL has been able to optimise where they allocate their media spend with media analytics now covering 85% of its total sales, helping drive digital media ROIs +23% in 2023, and traditional media +21%, leading to a total media ROI up 23%.¹⁴ For specific examples CL has used AI tools to help its sales team understand the best route to veterinarian visits and which products to discuss with vets. CL also piloted a Generative AI-enabled chatbot through partnership with Profitero in 2023, aimed at monitoring sales and inventory levels, and identifying out-of-stock trends and sales-driving product development ideas. Colgate's RoIC is forecast to improve from 38% in 2023 to 49% in 2026.¹⁵

¹² McKinsey, "The economic potential of generative AI: The next productivity frontier", 14 July 2023.

¹³ GIB AM Analysis & Bloomberg. Comparing the top 25% RoIC vs. Bottom 25% RoIC of MSCI World and rebalancing monthly. All return show in USD.

¹⁴ Colgate-Palmolive presentation at the Consumer Analyst Group of NY Conference (CAGNY), 23 Feb 2024.

¹⁵ Barclays & GIB AM Analysis, 2024.

Microsoft: As a Generative AI leader, Microsoft will likely be first to utilise all its productivity enhancing Copilots, such as GitHub Copilot and Microsoft 365 Copilot, across its 221,000-employee base. Developers using GitHub Copilot have a 55% increase in productivity.¹⁶ Early Copilot for Microsoft 365 users were 29% faster in series of tasks like searching, writing, and summarising.¹⁷ Microsoft's RoIC is forecast to improve from 42% in 2024 to 59% in 2027.¹⁸

In summary, frontier technology, such as GPU chips, is expected to see growth over 30% CAGR between now and the end of the decade. Driving this growth is the increase in demand for computing power which continues to grow exponentially thanks to applications, under the artificial intelligence umbrella, like machine learning and big data. For the global economy, AI is leading to an uplift in productivity of ca20-50% per person and adding 0.1-0.6% to GDP growth per annum.¹⁹ The growth in the adoption of AI across the spectrum of industries is motivated by the fact that companies integrating AI into their workflows can see margin and RoIC expansion. Share price outperformance typically follows RoIC expansion. For these reasons, companies exposed to top line growth from frontier technology demand as well as those benefitting from increasing efficiency are the types of holdings in the GIB AM Sustainable World portfolio.



¹⁶ Microsoft, 2023 Work Trend Index Special Report, "What can copilot's earliest users teach us about generative AI at work?", 15 Nov 2023.

¹⁷ Microsoft, 2023 Work Trend Index Special Report, "What can copilot's earliest users teach us about generative AI at work?", 15 Nov 2023.

¹⁸ Morningstar & GIB AM Analysis, 2024.

¹⁹ McKinsey, "The economic potential of generative AI: The next productivity frontier", 14 July 2023.

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