

Investing in the era of AI

Artificial intelligence is likely to prove one of the most consequential developments to emerge during our professional lives as asset managers.

- _ At DWS, artificial intelligence is starting to enable us to reexamine all our old business assumptions in a new light.
- _ Rather than thinking of data as “the new oil” (with finite deposits, just waiting to be discovered and claimed) a better analogy may be with renewable energy.
- _ For the foreseeable future, success in investing as in other areas is likely to also require good old fashioned, careful and very human thought.

Artificial intelligence (AI) has given a boost to the whole U.S. equity market in 2023.¹ However, its implications go well beyond the immediate market outlook. Instead, let me try to explain the big picture context. At DWS, we increasingly view AI as integral to what we do.

By now, you have probably become numb to such superlatives. Publications on AI abound. As do plenty of more or less well-informed conjectures on which industries, sub industries (and companies) are well positioned, and which ones might be most at risk from disruptive change. Indeed, at DWS, we have had several stabs at that already.² We plan to publish a lot more along those lines soon.

But for us, as a global asset manager with a fiduciary duty towards our clients, there are some rather more foundational issues.

At DWS we are positioning ourselves for investing in the era of AI by reexamining all our old business assumptions in a new light. Amend them, where appropriate. And do the whole process again and again and again, as new data comes in and we think of new ways of testing our assumptions of how this

brave, new emerging world may work in the future. How the investment environment is changing. Who our competitors are likely to be and what they are already doing. How and why we need to rethink our investment processes. How we can test long-held assumptions that worked well in the past, but have been mainly validated by the intuitive judgments of our experts, rather than validated and refined using data analysis.

Before very long, we fully expect to have plenty of new, AI-enabled tools to help us do so in all the activities along our value chain, delivering not just one-off but continuous improvements. How and why? Well, as a starting point, we would suggest that the way to think about AI is basically within the same overall framework you might use to analyze the implications of any new technology for investment activities. Markets are adaptive. But even if you think that financial markets are quite efficient most of the time and that new information is swiftly reflected in prices, this is often constrained by the technologies available (of course, you can also debate the whole proposition but that's quite a separate discussion).³ Importantly, the constraint very much includes investors and organizations figuring out how to use the new technology.

¹ 'Fear of missing out' drives retail investors to ride AI wave | Financial Times (ft.com)

² For a quick overview of some of our recent thinking, see, in particular, Generative AI – a new iPhone moment in tech? (dws.com)

³ For discussions on both, see the very useful book by Andrew Lo (2019, 2nd ed.) Adaptive Markets: Financial Evolution at the Speed of Thought, Princeton University Press

For any innovation, whether it is in gathering, transmitting, or processing new, potentially price relevant information, this introduces an arms race dynamic. When the first Atlantic telegraph cable became operational in July 1866, the time lag between the same information being reflected at both the New York and London stock exchanges shrank to zero days, from roughly 10 days previously.⁴

Any stockbroker in the late 1860s, who wanted to keep up with competitors, had no choice but to pay for this new source of information. Closer to our own time, the same basic logic can be applied to processing information, from calculators in the 1960s to personal computers or spreadsheets in the 1980s. However, these, and even more so the internet show that adapting to new technologies is not just a matter of getting the latest kit or software update. Instead, organizations and their employees need to rethink everything they do and understand how the new technology might enable them to continuously improve to keep up with their existing and future competitors.

From the perspective of a large, global asset manager, we think that generative AI will have a significant effect in democratizing data analytic techniques already available in theory but for now mainly used by some of the largest players. For example, where gathering or processing data has traditionally been costly, as well as hard to interpret, scale has been a key source of competitive advantage. By making all sorts of existing predictive data analytics techniques and tools more readily accessible to everyone who knows how to interpret the results, AI has the potential to prove transformative, by enabling smaller, nimbler players.

At least in the short to medium term, we think that the biggest effect of large language models (LLMs), which underpin tools such as ChatGPT, may turn out to be the ability to “translate” questions from human users into formats that can be used by other, more specialized AI applications to get their instructions, no matter how the human users may have phrased their questions. And similarly, LLMs can be called upon to “translate” responses generated by specialized applications into written, coherent responses that human users can actually understand and use to make decisions.

I chose these words with care. Talk to any operations teams about any IT project and you rapidly realize there is a big difference between something being possible in principle and actually implementing it in ways that work. Indeed, I have found a good way to judge AI expertise is to ask for both, the simple, big picture idea and a more precise description of how it might be implemented.

But no matter how one phrases it: for our industry and many others, it is a big deal that natural language processing is allowing users to automatically convert input text into numerical representations, which can be understood and analyzed by specialized applications. And that those “responses” and outputs can then be converted back into a human-readable format, at least in principle. Quite soon, smaller companies will likely be able to use sophisticated pay for usage tools via API subscription models and fine-tune them for their particular use-case using their proprietary data. Before very long, we very much expect similar, user friendly AI enabled tools to make new tools available to retail investors too.

Potentially the same logic holds for many other areas of business activity. Generative AI has the potential to make all sorts of existing predictive data analytics techniques and tools more readily available. It will enable an abundance of commercial use cases. Many users might not even know or care that they are using AI – in much the same way we increasingly take such earlier AI enabled innovations as navigation software, autocomplete language applications or voice activated personal assistants for granted.

At the same time as eroding some existing competitive advantages of incumbents, however, we also see countervailing effects. AI is likely to enable large, traditional asset managers to reap new benefits from having global scale and scope. To do so will require rethinking our investment processes. Most of the AI tools that we have seen emerge during the past decade are based on collecting, “cleaning” and stochastically using data to make better predictions. Data is thus central. But rather than thinking of data as “the new oil” (with finite deposits, just waiting to be discovered, claimed and extracted) a better analogy is with renewable energy. This very much includes the ideas being generated every day by our very talented colleagues

⁴ The previous delay reflected the time it took steamers to cross the ocean. Indeed, economic historians nowadays tend to use 19th century stock market pricing data to help estimate how quickly information was able to travel before that first cable. See, for example, Hoag, C. (2006). The Atlantic Telegraph Cable and Capital Market Information Flows. *The Journal of Economic History*, 66(2), 342–353. <http://www.jstor.org/stable/3874880>

around the world, only a small fraction of which are currently captured as data that can be used for machine learning.

The difference between Amazon or Google and traditional financial service providers is not so much that Silicon Valley firms have more potentially relevant data than Wall Street. They do (at least in terms of data ready to be easily used) but the main reason is not so much better access to potentially useful sources of data. It is that these technology firms are data centric in everything they do and how they organize themselves.

Think of AI as somewhat analogous to solar power and see the recent advances as a massive reduction in the costs of installing photovoltaic panels on top of any roof. That will not immediately transform every building into a smart home. But it's a nice start towards becoming more efficient to capture some of the energy previously lost. To take the analogy one step further, at DWS, we have global scale and scope. That gives us many good locations with plenty of sunshine just waiting to be used to power our progress.

In data centric technology firms, all their processes are based on the assumption that collecting, curating and using data is central to their success from the very beginning of building their business model. That you need to test and revise preconceptions about how your market works, how your customers tick and how you create value, by collecting and analyzing solid evidence every day, using the best available data analytic tools. And then using your learning to think of even better ways to collect data to test your revised preconceptions.⁵

Traditional asset managers can learn a lot from this mindset. AI enables us to build on decades of experience of what has worked in practice, by making it easier to test the preconceptions we previously relied on because of expert intuition.

As happens often when technology seems to be evolving fast, there are currently plenty of fears, as well as hopes.⁶ The economic fallacies, we would strongly argue, partly stem from failing to consider how specific economic activities, as well as whole economies, tend to respond to technological breakthroughs and resulting changes in the relative costs of various goods, services, and tasks. We will have plenty more to say about this in future publications as well.

However, the more urgent issue is to realize what the current generation of AI tools are not, at least not yet. In their very useful introductory book on the economics of AI, economists Ajay Agrawal, Joshua Gans and Avi Goldfarb offer many examples of various firms and people having their "AI Insight" moment in the years after 2012.⁷ Typically, this involves reframing thorny engineering challenges, such as how to program vehicles to drive autonomously, into simple prediction problems along the lines of "What would a good human driver typically do?" and then collecting and stochastically using enormous amounts of data on human behavior.

This promises plenty of further gains, allowing parts of many workflows to become automated. For lots of tasks, skilled human practitioners are able to easily agree on what a correct response should look like; success can be measured; swift feedback loops can be put in place; and "all" that's missing is pairing enabling technologies with processes that collect relevant data on how employees already tackle such frequent problems and tools to analyze the data. In these areas, one might expect AI to surpass human expertise, perhaps quite soon, as there are good reasons to think of many forms of expert intuition as a form of pattern recognition.⁸

We think that AI will be increasingly useful to take over relatively routine but time-consuming tasks. However, this is more likely to augment, rather than replace human expertise, precisely because pattern recognition is of limited use, if encountering rare or unusual problems. For the foreseeable future, success in investing as in other areas is likely to require not just constantly improving AI enabled tools and processes, but also good old fashioned, careful, and very human thought. Not least in identifying areas for further improvements before competitors do.

To conclude, these are exciting times. At DWS, they critically involve rethinking how internal processes are organized. How we can get better at generating useful proprietary data. How to focus more on the various inputs in our investment processes, rather than judging and measuring success mainly in terms of outputs. How to generate more ideas, try them, test them, and get better at understanding the causal mechanisms behind success and failure alike. And explaining to you what we are learning along the way.

⁵ For a nice illustration in a start-up context, see Ries, E. (2011) "The Lean Startup: How Today's Entrepreneurs Use Continuous Innovation to Create Radically Successful Businesses", Portfolio Penguin

⁶ Pause Giant AI Experiments: An Open Letter - Future of Life Institute

⁷ Agrawal, A., Gans, J. and Goldfarb, A. (2018), "Prediction Machines: The Simple Economics of Artificial Intelligence", Harvard Business Review Press

⁸ Kahneman, D. (2012) Thinking, Fast and Slow, pp. 234 – 244, Penguin

GLOSSARY

Artificial intelligence is the theory and development of computer systems able to perform tasks normally requiring human intelligence

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