



## Generative AI represents a turning point for humanity – for better and for worse

The AI hype cycle is in overdrive. It feels like the volume of text generated by ChatGPT over the past six months has almost been matched by the volume of hyperbole about how foundation models will change the world.

For once the hype is (mostly) justified. Generative AI is not another metaverse or, for that matter, another crypto currency. But it will change the world – for better and for worse.

Three things are different this time: the general nature of the technology, the low barriers to entry and the unprecedented speed of adoption.

This will lead to waves of repercussions for society, including further concentrating economic power in a handful of technology companies, launching myriad new industries and overturning our understanding of the truth.

With all this in mind, we thought it was time to take stock and cut through the noise to give a clear perspective on what it means for investors and businesses.

This week Jim Reid's Thematic Research team is publishing a series of reports analysing what AI means for the economy, where the smart money is going and who the winners and losers will be. We start later today with Jim and Henry Allen's analysis of historical responses to technology. It indicates that recent advances – like many before – are likely to spell good news for jobs, growth and productivity in the long run – but maybe not before some significant upheaval.

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### What is different this time?

Three things are different this time. Firstly, the nature of the technology. Generative AI is a general purpose technology like few others. The more computing power, data and users it gets, the better it performs, sometimes in unexpected ways. Its talents range from sifting through data and recognising images and speech, to identifying sentiment in swathes of documents and generating text, images and code. Future iterations will soon do still more. Most importantly, it synthesizes these tools so they feed on each other.

Secondly, the barriers to adoption are so low that almost any one of the five billion people with access to the internet can – right now – operate a chatbot based on a large language model at no cost and with little or no training. A natural language processing interface that looks and feels like a familiar search engine, and a rapidly proliferating offering of closed and open source models, put it in a different class from earlier innovations. The smartphone, for example, took several years to pick up momentum and refine its offering with well-heeled innovators and early adopters shelling out for iPhones before coming close to realising its potential and becoming ubiquitous.

Finally, the speed of adoption has been unprecedented. Launched at the end of November, ChatGPT had a million users within a week and 100 million within two months. Each of those users is feeding it data that improves the model. Most technology is enterprise first and consumer second – most people first used a PC or the internet in the office thanks to a deep-pocketed company before buying one to use at home. ChatGPT is different, spreading virally with consumers who are using it not just to compose high-school history essays and graduation speeches, but also to (sometimes surreptitiously) speed up office work while their employers wring their hands about accuracy, governance and controls.

Compare this to the rollout of the car. It took 20 years or more from the beginning of mass production at the turn of the 20th century for cars to become widespread on roads in most rich nations. Even by the 1960s, fewer than one in two UK households had a car. There was time for the labour market and infrastructure to adjust and the consequences unfurled over decades, including the growth of suburbs, mobility in search of jobs, and even pollution and climate change. Electric vehicles and self-driving cars face similar challenges as the existing infrastructure slowly adapts. By contrast, the emergence of generative AI is like handing everyone a self-improving car – no licence necessary – and flicking a switch to turn every traffic light green.

### Cause for excitement and concern

The hype-mongers are therefore justified in being both excited and concerned. It used to be said that it was impossible for humans to imagine new technology or the uses of emergent technology more than about 30 years ahead. Generative AI brings that horizon significantly nearer, with a chorus of experts admitting they underestimated the pace of recent developments. There is broad agreement that



Artificial General Intelligence – the way-station between Narrow AI and Superintelligence – is now only a few years rather than decades away, as had been the view before the LLM breakthroughs.

The consequences will come in waves, with each one likely concealing another behind it. Philosophers will be occupied for years. The famous open letter signed by luminaries from Steve Wozniak to Elon Musk in March calling for a pause increased the volume of debate. However, it has yet to spark real action, in part because of the pragmatic response that if the US does not continue moving towards AI, then China and Russia will. AGI could well transform geopolitics, bestowing first-mover advantages and winner-takes-all outcomes. Whoever achieves it first will be in a commanding position to dominate commerce, regulatory policy and military confrontations.

### Imminent consequences for truth, jobs and the economy

In the meantime, there are imminent consequences for which companies and institutions need urgently to prepare.

The truth is under siege. The threat of large neural networks is real and growing exponentially in almost all walks of life. Geoff Hinton, the so-called godfather of AI, quit Google at the start of this month to speak out about the danger of “bad actors using [AI] for bad things”. His warnings must be taken seriously.

More than a decade after social media achieved a critical mass, society is still reeling from its ability to multiply misinformation created by humans. We now face the prospect of orders of magnitude more misinformation created by LLMs. There is simply no text, no voice recording and no video clip whose content we will be able to trust unless we know it comes from a trusted source, and even then with caveats. Any voice or image can be a deep fake, already able to be created with as little as a three-second recording of the person to be imitated. Political candidates meanwhile will know everything there is to know about voters and to interact persuasively with them in a virtual one-on-one. We will not be able to tell whether an AI algorithm wrote a piece of music, painted a painting or drafted a research paper. The speed of progress is exponential, measured in weeks rather than decades.

The implications for our economies are almost unimaginable. Generative AI will change what we do and how we do it – very fast. It is true that employment evolves and that a large number of current jobs didn’t exist just 30 or 40 years ago. However, by the end of the decade, if not sooner, LLMs will upend the desk-bound service industries that evolved in the West with the relative decline of manufacturing over several decades.

Everyone will be affected by a qualitative shift in work activities, with whole swathes of current white-collar employment being at risk. Earlier labour-saving innovation mostly impacted less skilled labour, while AI will replace the current middle bulge of knowledge work. In the meantime, it will further empower those who are already well-endowed with ingenuity and the ability to join the dots. The promise of more jobs and leisure time in the long run will not offset rapid dislocation, an upheaval in the job market and the social tensions that this will bring in the short to medium term.

For now, only the large technology firms have the ability to train the largest LLMs. Unless open source alternatives are able to offer equivalent enterprise-grade



quality, reliability and latency, big tech will reap most of the benefits. Those companies are unlikely to agree to slow progress or put guard rails in place, and will come to dominate the political agenda.

We are also likely to see whole new industries, such as internet platform businesses, springing up, particularly in the US. Our instantaneous knowledge of how economies work, gained from instant data from payments, footfall and shipping, will vastly improve our understanding and our ability to isolate the drivers of key variables.

### Taking stock

With all this in mind, we thought it was time to take stock of this emerging phenomenon. Today we launch a week-long series of reports analysing what AI means for the economy, where the smart money is going and who the winners and losers are likely to be. The wide range of views among experts outside Deutsche Bank has been matched by a lively debate within it. We start with a report by Jim Reid, whose analysis of historical responses to technology indicates that recent advances – like many before – are likely to spell good news for jobs, growth and productivity in the end.

The rise of generative AI fires the starting gun in a race against time with a technology that experts freely admit they don't fully understand. It will change the world. The case for optimism is strong but harnessing AI for good may prove to be one of the toughest challenges humanity has ever faced.



# Appendix 1

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