



# AI in action: how first movers are using ChatGPT

#PositiveImpact

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What can  
generative AI  
do?

How much is  
it being used  
and where?

Who are the  
players in the AI  
ecosystem?

What are the  
opportunities for  
businesses?

Three themes for  
the future

What comes next?

# What's the use in FOMO?



The most important acronym in Artificial Intelligence right now is not LLM (Large Language Model) or GPT (Generative Pretrained Transformer), but FOMO (Fear of Missing Out).

Enterprises are inundating technology companies demanding AI products and services. Investors are piling into chipmakers and software companies. Entrepreneurs have connected almost 600 plugins to the most well-known chatbot, ChatGPT, since it started supporting them in late March.

But FOMO may be premature. History tells us that it takes years for new technology like the internet or mobile devices to go beyond enhancing existing activities to translate into new use cases. Moreover, unlike most other tech revolutions, generative AI is led by personal use. More rigorous enterprise applications are still mostly in “beta” testing after which they face multiple operational, governance and cultural barriers.

This report aims to give potential enterprise users and investors a practical perspective, showing where generative AI is beginning to be deployed now and where its potential lies in the future.

It is the latest in our AI series, which also includes a [101 primer](#). For more, see our dedicated [dbResearch AI microsite](#).

## Contents

1. What can generative AI do?
2. How much is it being used and where?
3. Who are the players in the AI ecosystem?
4. What are the opportunities for businesses and industries? Use cases
5. Three themes for the future
6. What comes next?

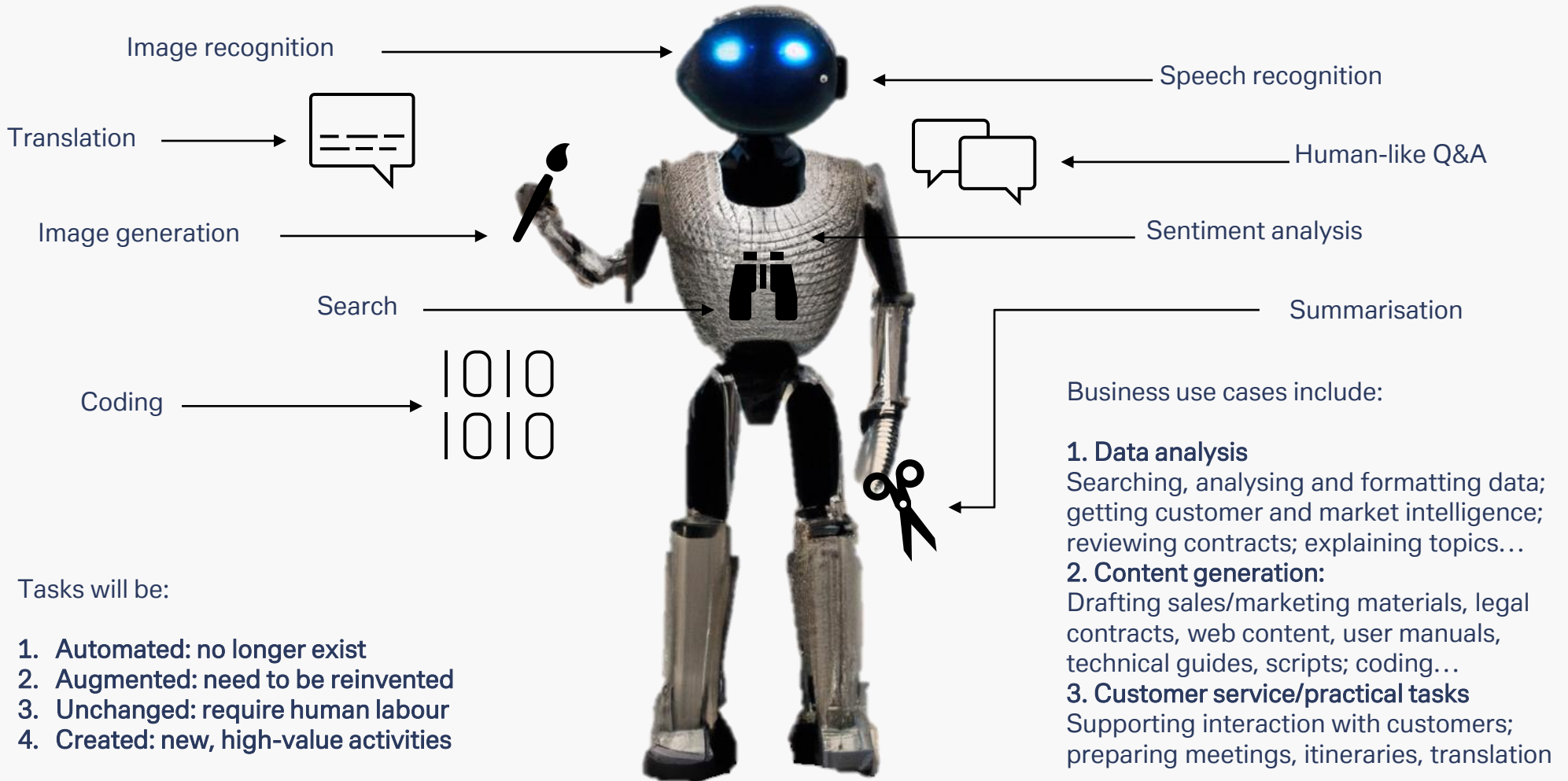


Image by DALL-E



# 1. What can generative AI do?

Generative AI is a general-purpose technology that takes unstructured data, eg text/images, turns it into digital assets, processes it, and generates new text/images etc; foundation models can be quickly fine-tuned to perform myriad tasks



Tasks will be:

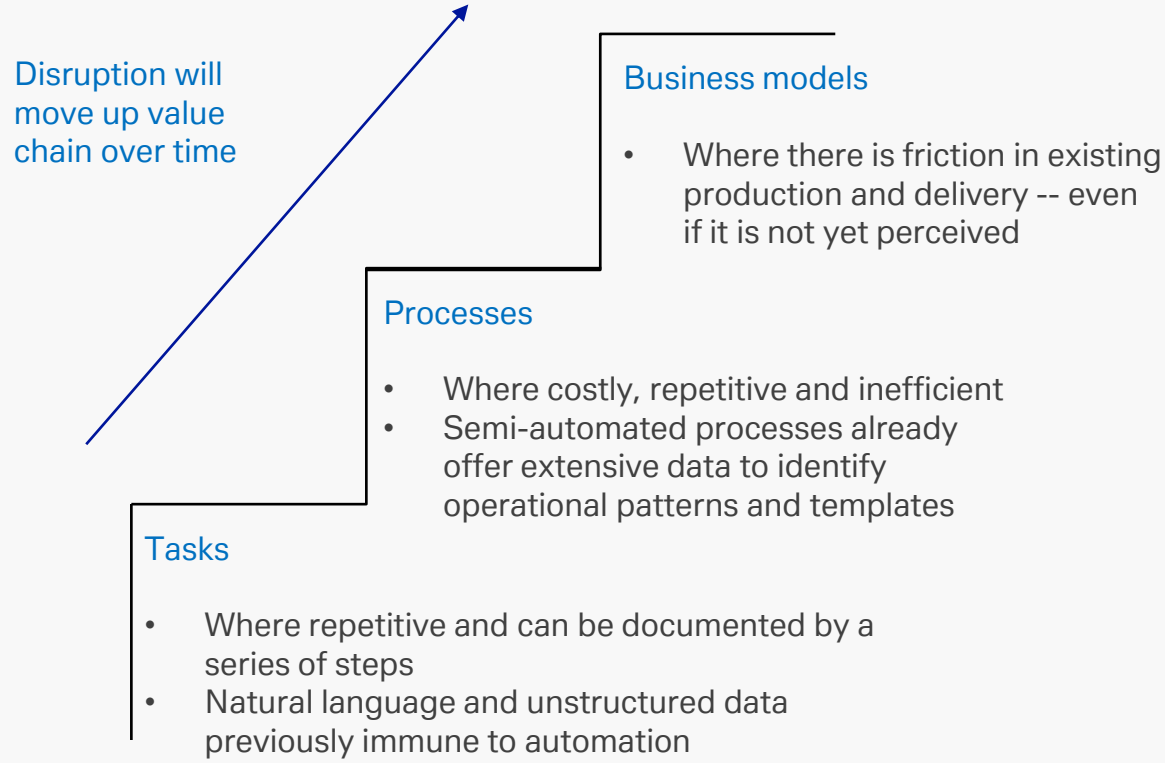
- 1. Automated:** no longer exist
- 2. Augmented:** need to be reinvented
- 3. Unchanged:** require human labour
- 4. Created:** new, high-value activities

Source: Deutsche Bank.



# 1.1. What areas are most prone to AI disruption?

Generative AI initially promises to augment routine tasks and then to improve inefficient processes in enterprises. In due course, innovations will disrupt business models (as per food delivery via mobile using mapping, payments etc)



## Scope for AI disruption up value chain

### Long term

- Revenue-focused; opportunity for new entrants
- New business models may disruptively combine AI with other technologies

### Medium term

- Cost-focused; opportunity for incumbents
- Streamlining operations; extracting more value from proprietary data; improved software engineering; may impact third-party, labour-intensive functions, eg customer services

### Short term

- Incremental productivity focus; widespread opportunity to automate or reinvent structured tasks
- AI implementation likely to include individual productivity augmented by tools, eg copilots

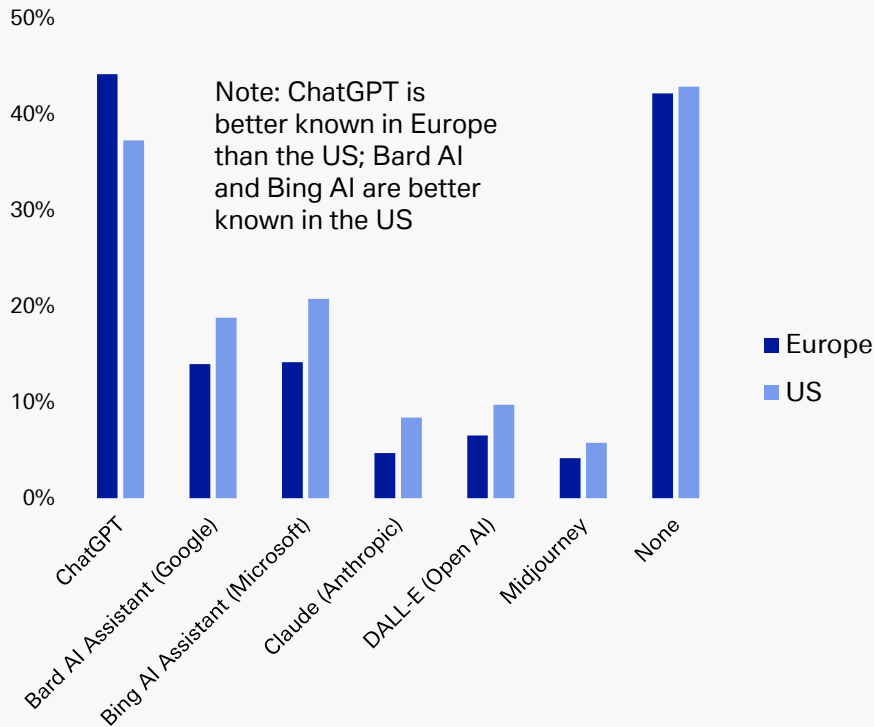
Source: Deutsche Bank



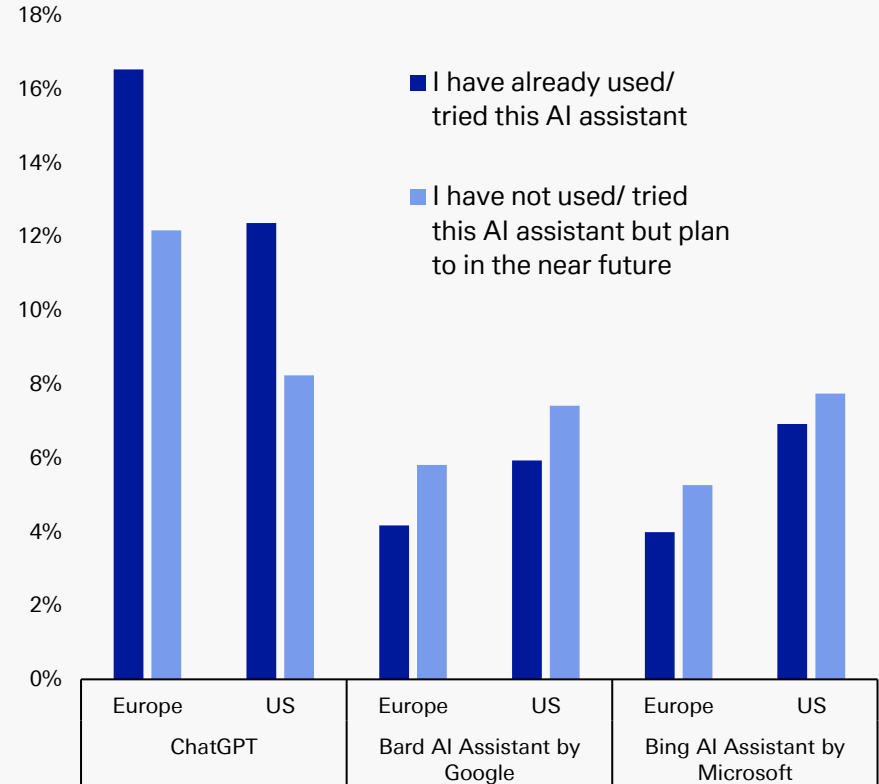
## 2. How many people are using generative AI so far?

Little more than half of Europeans and Americans have heard of any of the most discussed AI applications, our survey shows. ChatGPT is best known, particularly in Europe. Fewer than 20% of people have tried chatbots yet

Before today which, if any, of the following Artificial Intelligence (AI) assistants had you heard of?



With the following AI assistant(s) in mind, which of the following sentences best describes you?



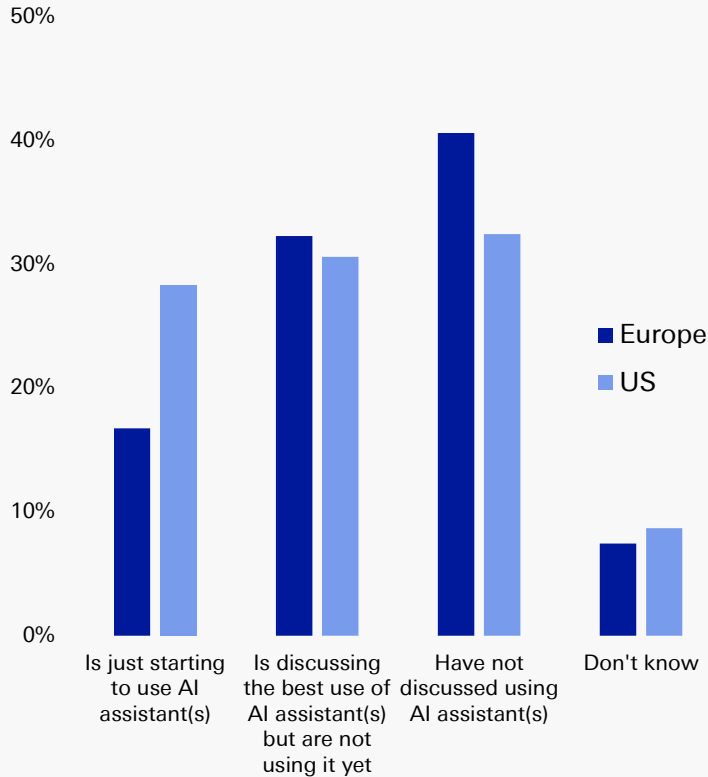
Source: Deutsche Bank dbDIG proprietary survey, Europe numbers are medians of France, Germany, Italy, Spain, and the UK



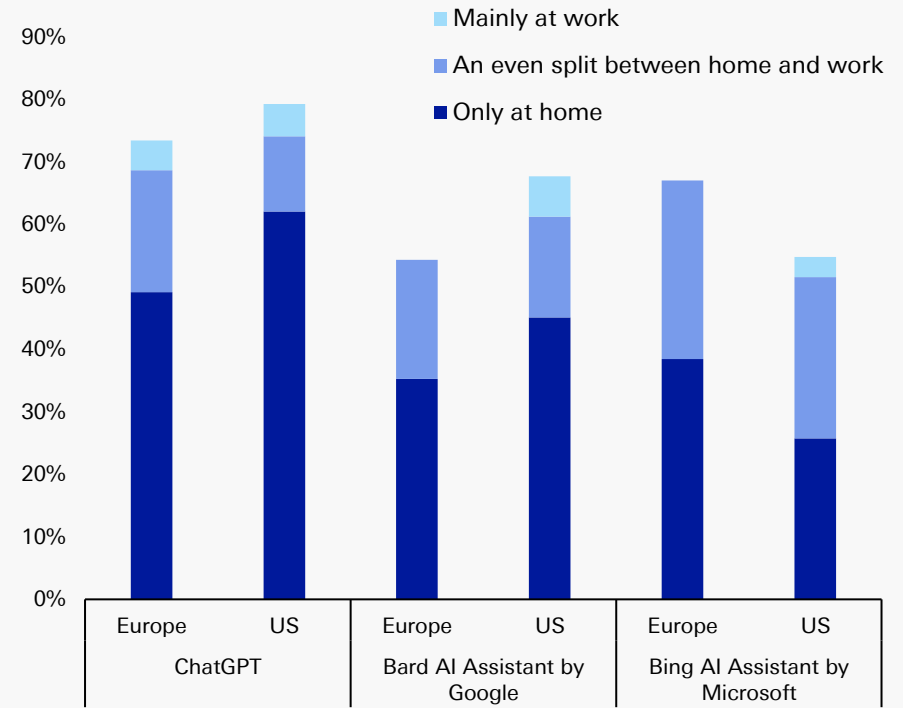
## 2.1. How much are people using ChatGPT at work?

While more Europeans have heard of ChatGPT, Americans have been more proactive at using AI at work. So far, use of the three most popular AI applications has been at home, although a substantial share has used Bing AI at work too

Does your place of employment use AI?  
(For those who have heard of chatbots)



Where have you used the following AI applications?  
(For those who have heard of and used chatbots)



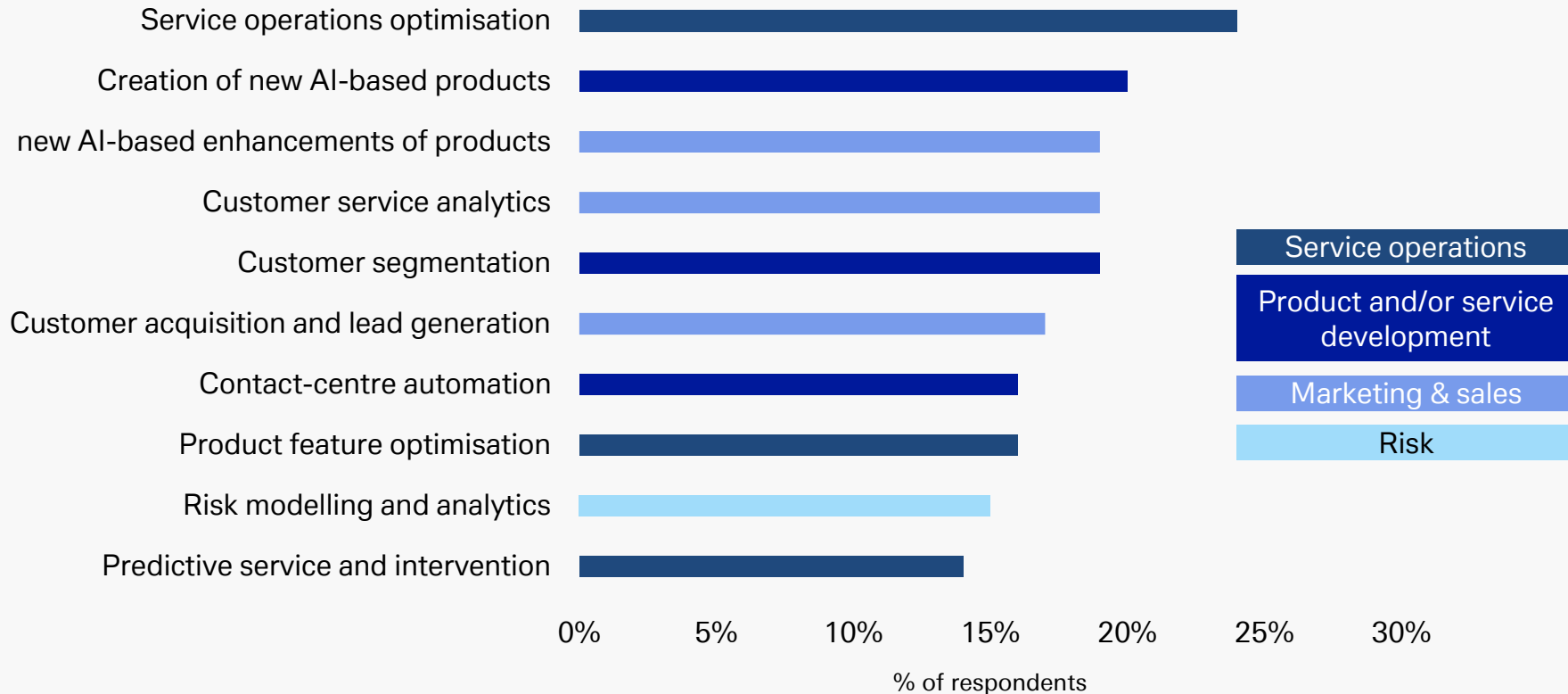
Source: Deutsche Bank dbDIG proprietary survey, Europe numbers are medians of France, Germany, Italy, Spain, and the UK



## 2.2. Where is AI being used most extensively?

Service operations is the top function using AI, led by consumer goods/retail where it is being used by almost one third of respondents to a recent survey. AI for product and service development is led by financial services, with 31% uptake

Most commonly adopted AI use cases by function, 2022



Source: "The AI Index 2023 Annual Report" by Institute for Human-Centered AI, Stanford University, citing data from McKinsey & Co Survey, 2022

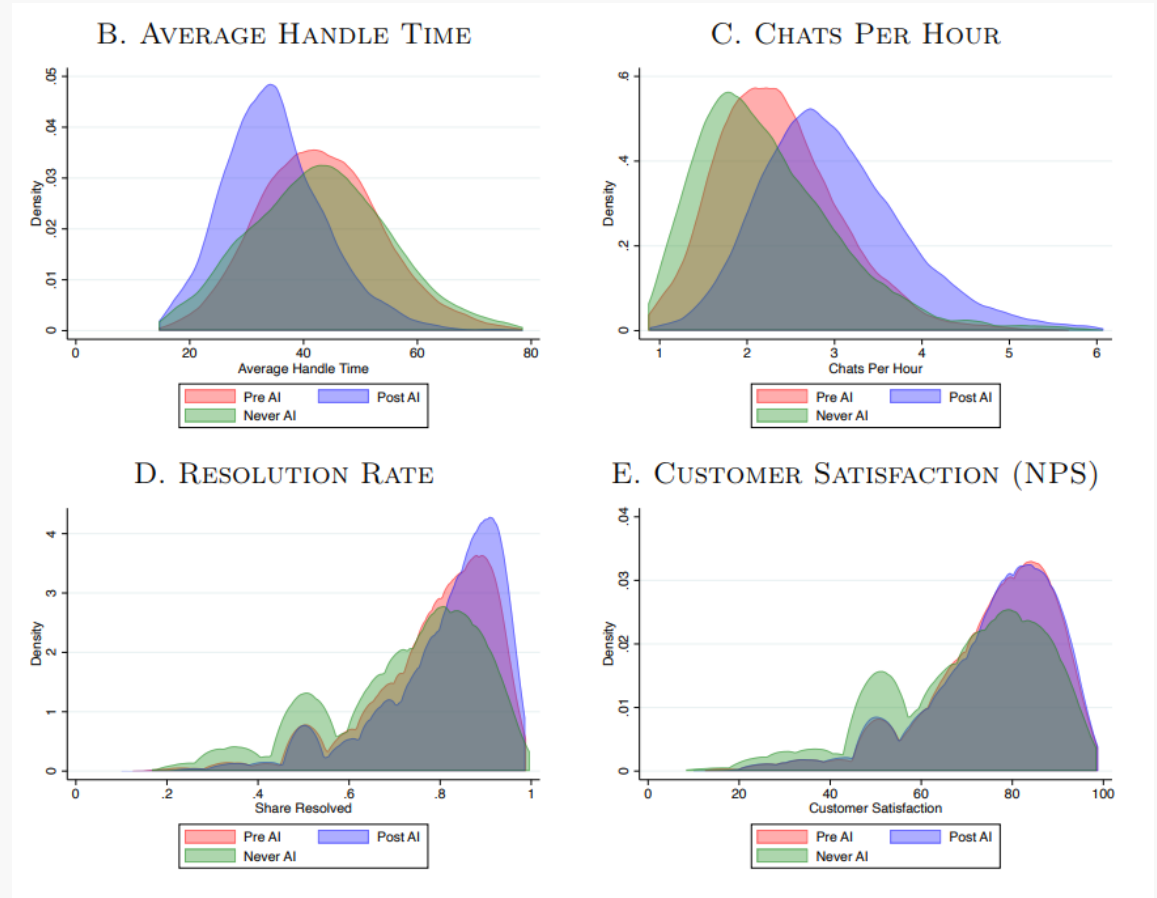
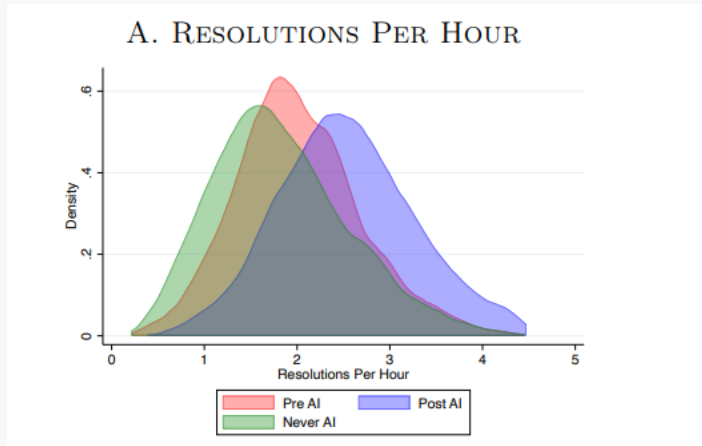


## 2.3. What difference does generative AI make? Case study

A recent landmark study of an AI-based conversational assistant rolled out to 5,179 customer support agents found it boosted productivity, particularly for new joiners, and improved knowledge sharing, retention and customer sentiment

### AI-based conversational assistant for customer support agents at Fortune 500 business software company

- Access to tool increased productivity, in issues resolved per hour, by 14%
- Greatest impact on novice and low-skilled workers; minimal impact on experienced and highly skilled workers
- Effectively disseminated tacit knowledge
- Cut time spent handling issues by 9% and requests to speak to manager by 25%
- Improved retention and customer sentiment



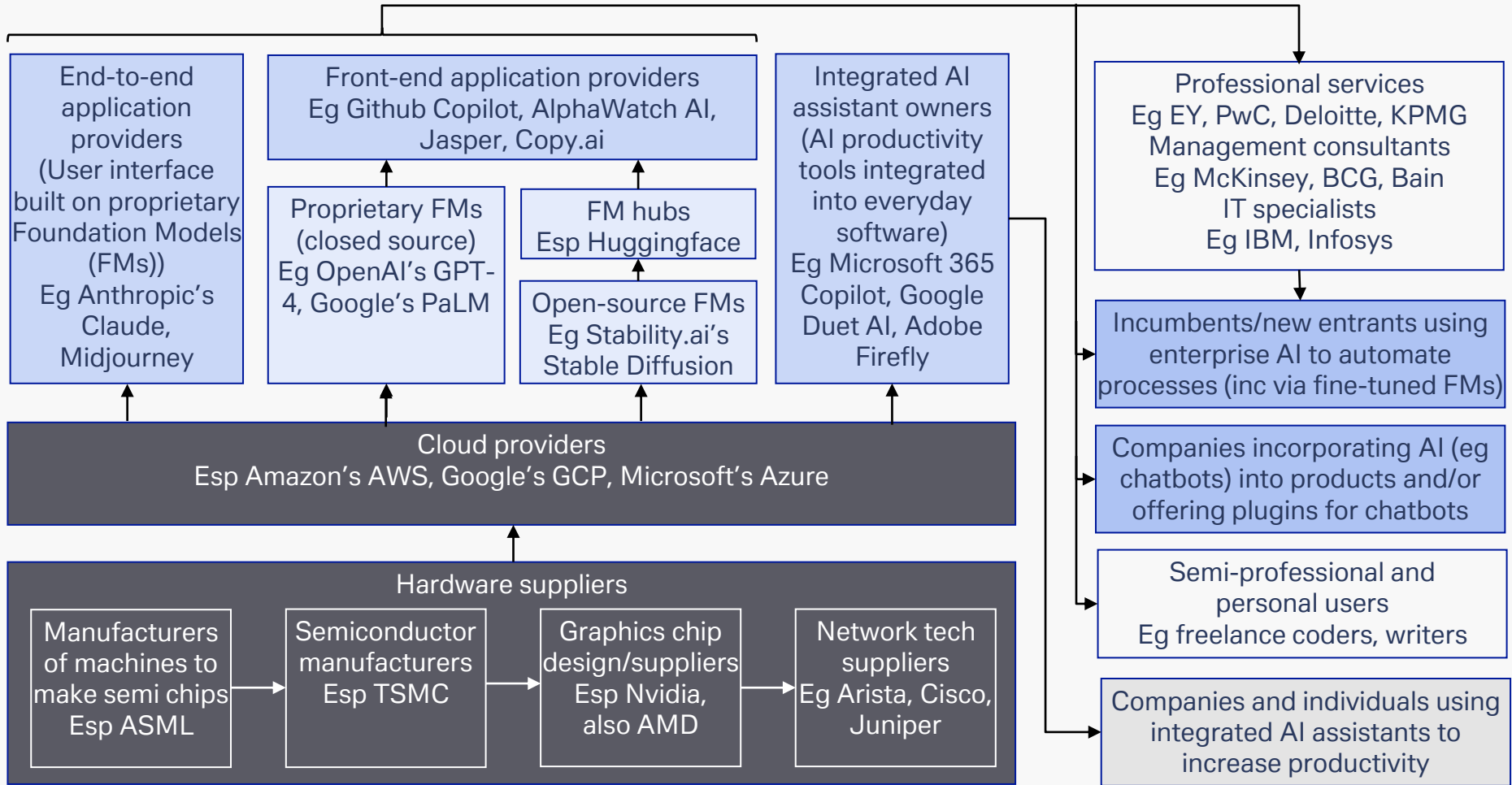
Source: Erik Brynjolfsson, Danielle Li and Lindsey R. Raymond, "Generative AI at Work," National Bureau of Economic Research Working Paper No 31161, April 2023





### 3. Who are the players in the generative AI ecosystem?

The value chain stretches from the manufacturers of machines to make semiconductor chips through foundation model and large language model companies all the way to companies and individuals directly and indirectly using AI

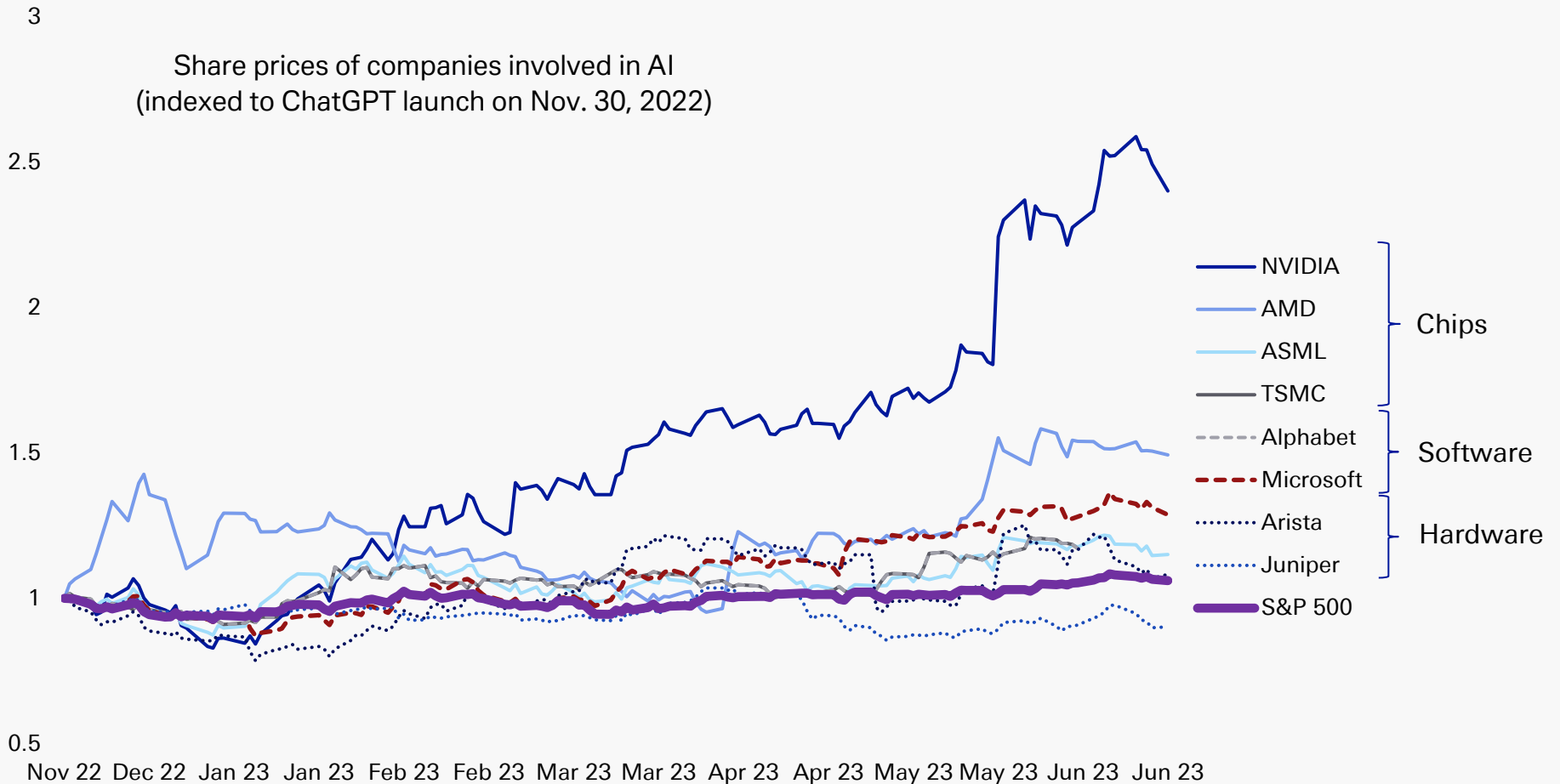


Source: Deutsche Bank



### 3.1. What has happened to the shares of major AI suppliers?

Nvidia surged to a \$1 trillion valuation at the end of May thanks to its position as by far the dominant maker of graphics processing units (GPUs). These are essential for generative AI as they excel at running many smaller tasks in parallel



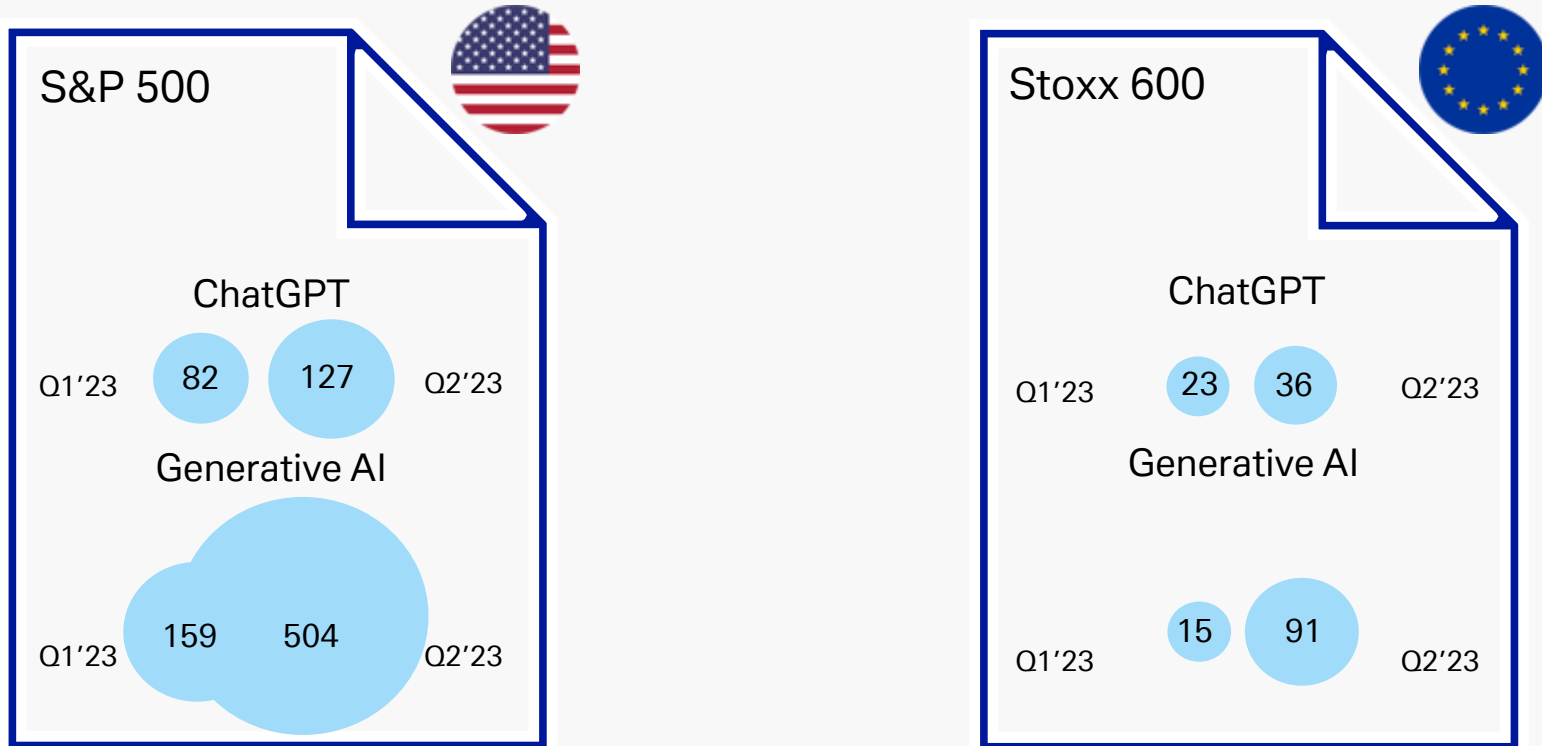
Source: Factset, Deutsche Bank



### 3.2. How much is generative AI part of the corporate narrative?

Generative AI, barely referenced last year, was mentioned 10 times in S&P company earnings calls for Q4 2022, 159 times for Q1 2023 and 504 times for Q2 2023. The first time it was mentioned in a Stoxx 600 call was for Q1 this year

Number of mentions in company transcripts

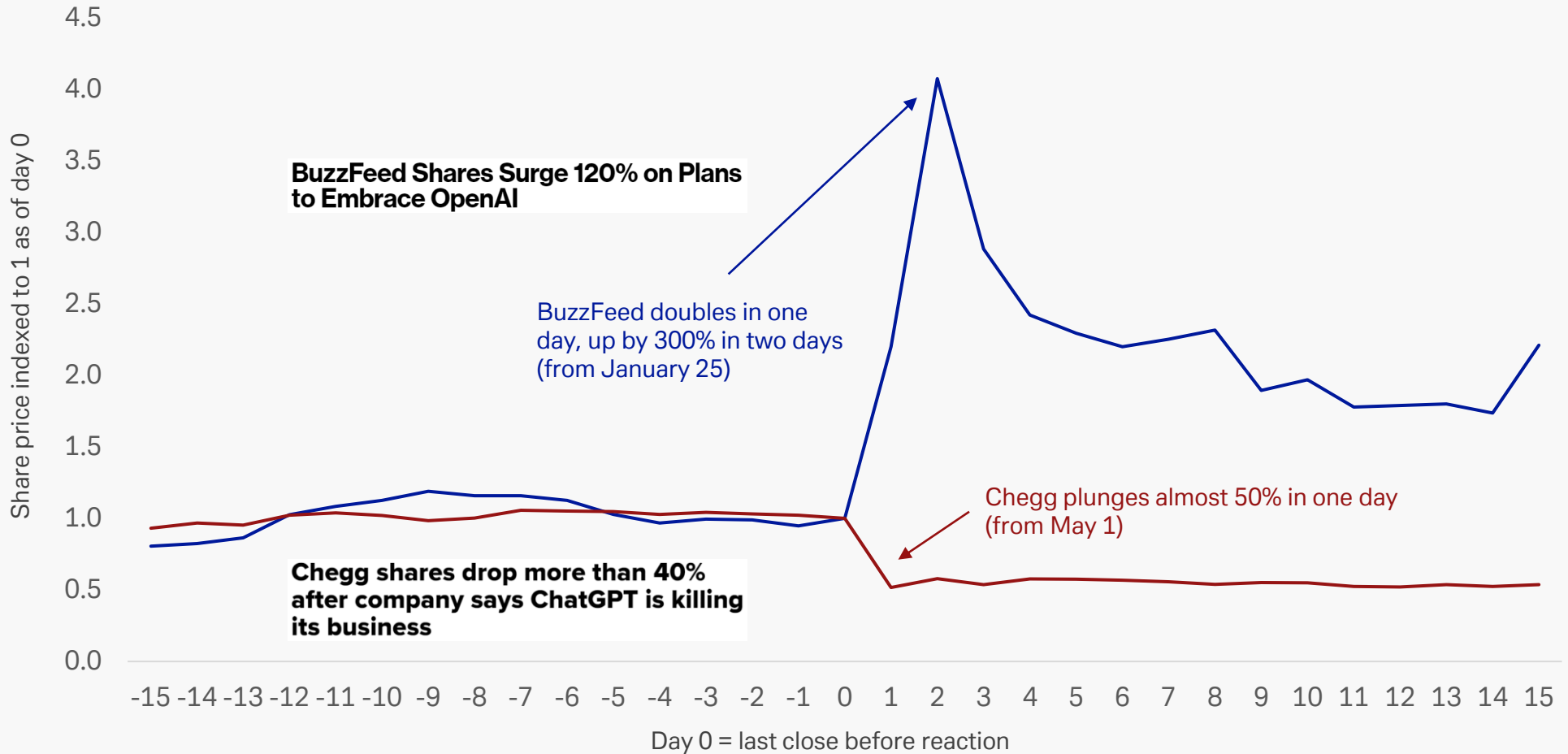


Source: Bloomberg Finance LP, Deutsche Bank



### 3.3. What does it mean for smaller companies?

Share prices have been volatile for smaller companies that have disclosed strategic plans and challenges from AI – see the divergent responses to BuzzFeed, US digital media company, and Chegg, a US educational tech company



Source: Bloomberg Finance LP, Deutsche Bank

# 4. What are the opportunities for businesses and industries? Overview



## 1. Data analysis

### Associated Press

- Scanning, analysing social media feeds/sentiment



## 2. Content creation, editing

### Allen & Overy

- Using GPT to help create first-draft legal documents



## 3. Customer service, support

### Unilever

- "Alex" filters customer emails, gives responses

## Industry: 1) Healthcare

- Medical imaging analysis
- Personalised medicine
- Virtual primary physicians

## Industry: 2) Financial services

- Risk management
- Personalised products
- Auto customer support

Source: Media reports, company announcements, Deutsche Bank.

# 4.1. What are the opportunities for businesses? Use cases



## 1. Data analysis



### Associated Press

- Scanning, analysing social media feeds/sentiment with NLP; verifying user-generated content

### KPMG

- Assessing company's growth potential based on financial analysis based on own data; esp for M&A

### Bain & Co

- Offering ChatGPT service to clients to analyse unstructured data and generate business insights

### PitchBook

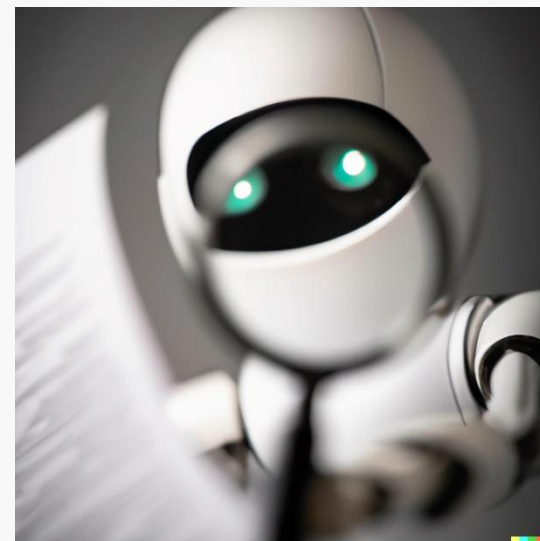
- VC exit predictor evaluates how likely a company is to go public or be acquired (said to be 75% accurate)

### Headline (VC firm)

- Assessing and comparing targets for investment using web traffic, new users etc to target potential

### Zurich Insurance

- Investigating extracting data from claims descriptions and write code for statistical models



Source: Media reports, company announcements, Deutsche Bank. Image by DALL-E

## 4.2. What are the opportunities for businesses? Use cases



### 2. Content creation



#### Allen & Overy

- Using Harvey, built using OpenAI's GPT technology, to help come up with first drafts of legal documents

#### WPP

- AI is "fundamental" to future business, used to create ad campaigns and develop personalised ads

#### Mattel

- Using DALL-E 2 image generator to design new toys

#### Unilever

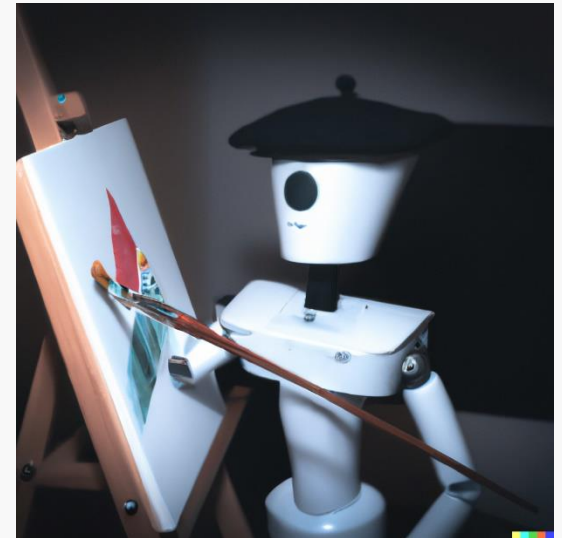
- "Homer" generates Amazon product listings with correct brand tone

#### Inworld

- Using GPT-3 to bring non-playable characters in games to life with distinct personalities, dialogue

#### Waymark

- Generating custom scripts ("done-for-you" instead of DIY) for users of TV/video ad generating platform

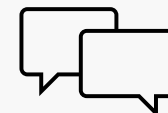


Source: Media reports, company announcements, Deutsche Bank. Image by DALL-E

## 4.3. What are the opportunities for businesses? Use cases



### 3. Customer service, support



#### Wendy's

- Automating drive-through service with Google AI chatbot to welcome clients and take orders

#### Instacart

- Adding ChatGPT to shopping app so customers can ask for suggestions for recipes, healthy food etc

#### Snap

- Launched MyAI, a customised ChatGPT, for Snapchat users

#### Stripe

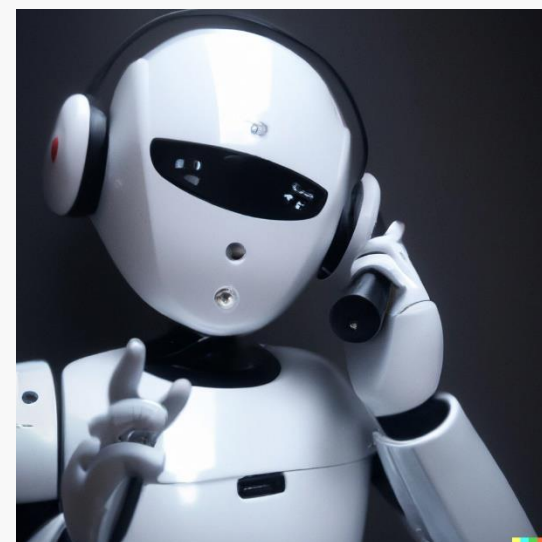
- Scanning customer sites to understand needs; answering support questions about user guides; detecting fraud on community platforms

#### Unilever

- "Alex" filters customer emails, throws out spam, then suggests responses for human agents

#### Be My Eyes

- "Virtual Volunteer" recognises real-world objects, locations and websites then describes to visually impaired users



Source: Media reports, company announcements, Deutsche Bank. Image by DALL-E



## 4.4. What are the opportunities in industries? 1) Healthcare



### 1. Data analysis

#### Medical imaging analysis

- Enabling radiologists and cardiologists to identify issues and compare with huge datasets for context

#### Optimised development

- Predicting from databases of molecular structures which potential medicines will be effective

#### Analysing unstructured data

- Helping doctors to collect and interpret patient records and medical advances



### 2. Content creation, editing

#### Personalised medicines

- Interpreting data and using predictive analytics to identify future risks, correct doses etc taking into account personal factors

#### Developing genetic medicine

- Predicting genetic diseases from biomarkers and developing compounds to treat them

#### Enhancing 3D printing

- Improving durability of devices, tailoring implants and controlling quality



### 3. Customer service, support

#### Virtual primary care physician

- AI Q&A used to triage and support patients with personalised care, inc in remote locations and in underfunded health systems

#### Assistant to emergency staff

- AI used to analyse verbal and non-verbal cues to diagnose from phone calls

#### Logistics in hospitals

- AI to determine resource allocation, operations etc and to evaluate care

Source: Deutsche Bank.

## 4.5. What are the opportunities in industries? 2) Financial services



### 1. Data analysis

#### Investment analysis, research

- Evaluating patterns for active thematic investing, inc AI-enhanced portfolio construction

#### Risk management

- Detecting patterns and anomalies in data to assist with KYC, fraud detection, compliance, reporting, regulation

#### Analysing client data

- Assessing creditworthiness and loan applications by analysing many sources for financial history/credit score



### 2. Content creation, editing

#### Personalised products, services and marketing

- Developing tailored products such as robo-advisers, customised reports, targeted campaigns

#### Content generation

- Augmented capacity for research, communications, investor relations, sales notes, executive briefings, training materials and simulations

#### Software engineering

- Streamlining extensive IT systems in multiple languages via optimised coding abilities



### 3. Customer service, support

#### Automated customer support

- Taking unstructured calls, emails, chats etc (eg loan applications, account enquiries), filtering, reviewing and responding directly (self-service) or through agents

#### Data access and transparency

- Chatbots for employees and customers to quickly access data embedded in CRMs, policy/HR systems, research databases etc

#### Process automation

- Analysing and optimising processes and costs

Source: Deutsche Bank.

# 5. Three themes for the future: Rise of fully AI-integrated software

AI-integrated software, still to a large extent not generally available, will typically work across different everyday applications and connect to business data for content and context in a secure, private, compliant way



Microsoft 365 Copilot  
Google Duet AI for Workspace  
Zoom IQ, Adobe Firefly... etc...

## Documents

- Prepare me for my upcoming meeting (MS)
- Help me write a job post for a regional sales rep (Google)
- Draft a product announcement based on @Project [auto link to Word, PPT, Notes] (MS)
- Create a timeline for a launch... SWOT analysis... agenda... (MS)

## Email

- Convert my meeting notes into an email in Gmail (Google)
- Draft a response to approve but highlight risks from @Project (MS)

## Presentations

- Create a 10-slide presentation from the press release (MS)
- Animate this slide (MS)

## Spreadsheet

- Analyse data with Copilot (MS)
- What products were most profitable this quarter; create charts (MS)

## Meetings

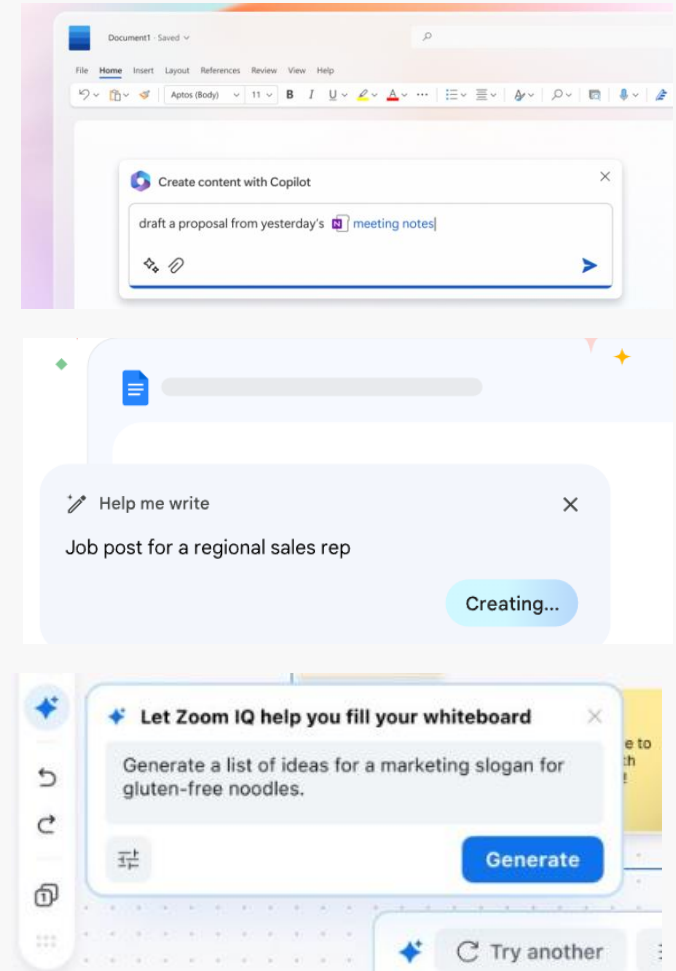
- Looks like you've joined late. We captured a summary for you (inc transcript, who said what and where people (dis)agree) (MS)
- Summarise the meeting, post a recap to the team and suggest actions (Zoom)

## CRM interaction

- Connect to CRM to pull customer data into interactions (MS)

## Images

- Generative Fill: eg "Classic car..." integrated into image (Adobe)



Source: Examples on promotional sites for Microsoft, Google, Zoom, Deutsche Bank.



## 5.2. Three themes for the future: Chatbots converge with search (1)

Fast-emerging third-party plugins offer capabilities similar to augmented search, including real-time information, integrated bookings and purchases, and the ability to search pdf documents and websites via links

Looking to eat vegan food in San Francisco this weekend.

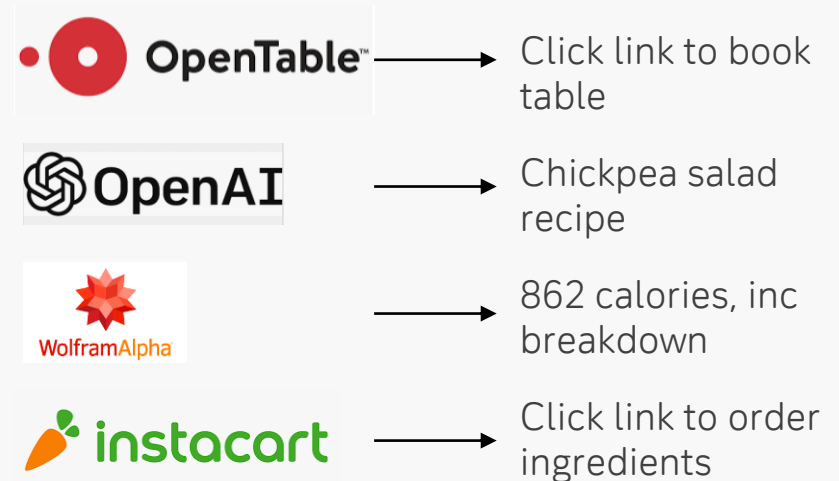
Can you get me one great restaurant suggestion for Saturday...

... And a simple recipe for Sunday (just the ingredients)?

Please calculate the calories for the recipe using WolframAlpha.

Finally order the ingredients on Instacart

### Plugins and chained steps



Other plugins include browsing, open source retrieval and code interpreter, AskYourPDF, LinkReader etc

Source: OpenAI

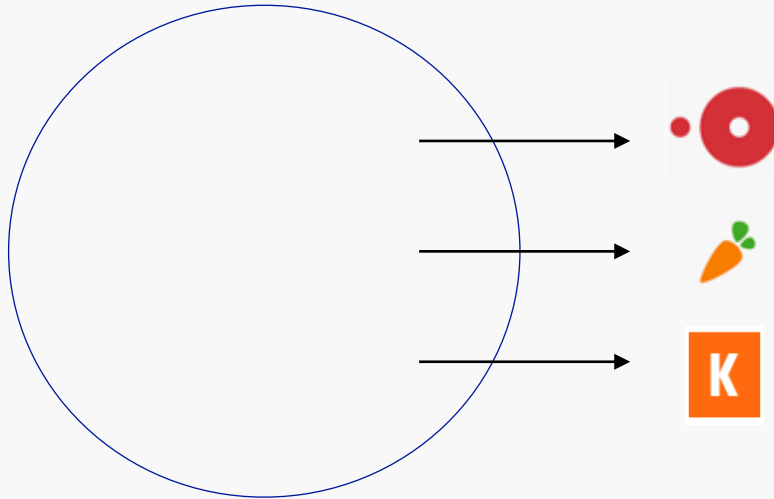


## 5.3. Three themes for the future: Chatbots converge with search (2)

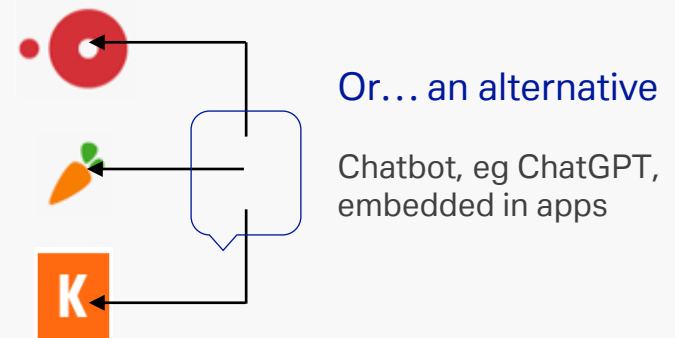
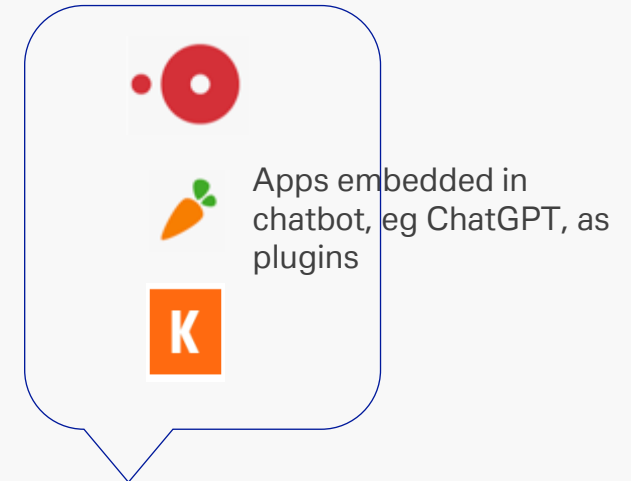
Search engines earn advertising revenue by sending traffic to third-party sites. In future, customers might access products and services via apps embedded in an “always on” chatbot personal assistant, or via chatbots embedded in apps

### Current model

Search engine directs users to food, grocery, travel etc sites/apps



### Future model?

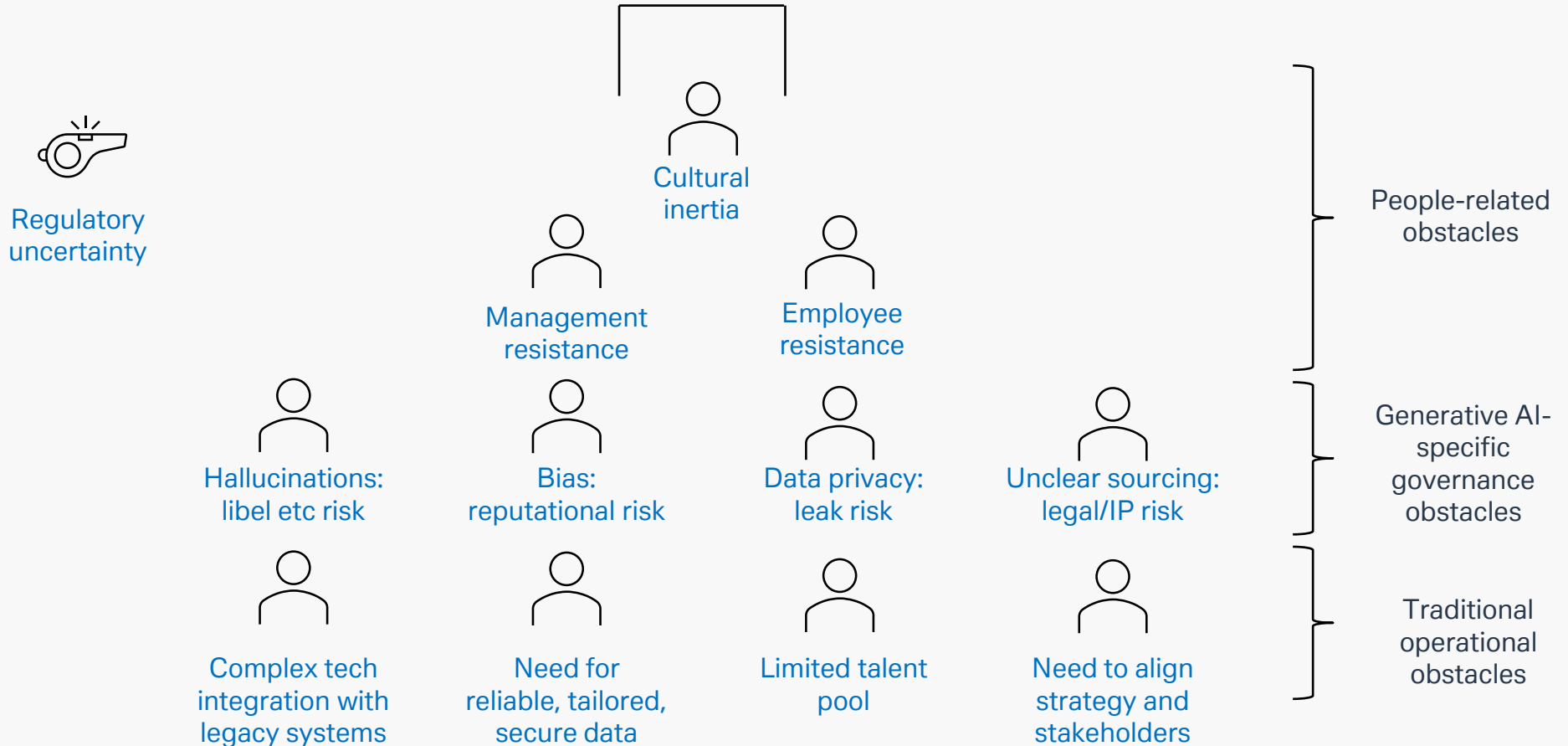


Source: Deutsche Bank.



## 5.4. Three themes for the future: Obstacles to business use

Anecdotal evidence suggests adoption of generative AI is still relatively limited due to people, governance and operational hurdles. These will take time to be addressed with human monitoring, ringfenced data, training, policies etc



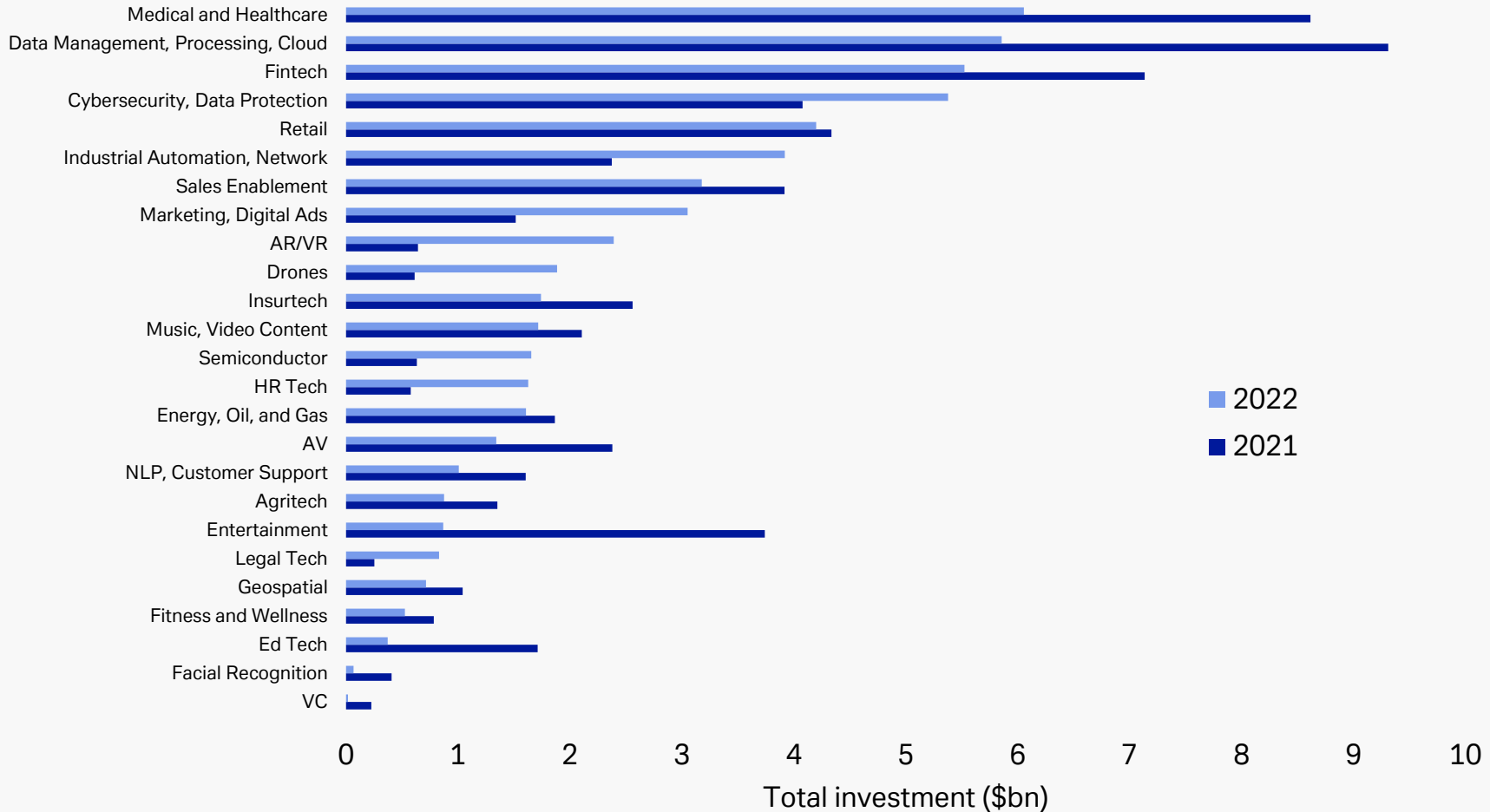
Source: Deutsche Bank



## 6. What comes next and where is the focus for investment in AI?

Global private investment in AI peaked at \$125bn in 2021 and slipped to \$92bn in 2022. Over half (\$47bn) was invested in the US, then China (\$13bn) and the UK (\$4.4bn). Medical, data and fintech investments dominated.

Private investment in AI by focus area

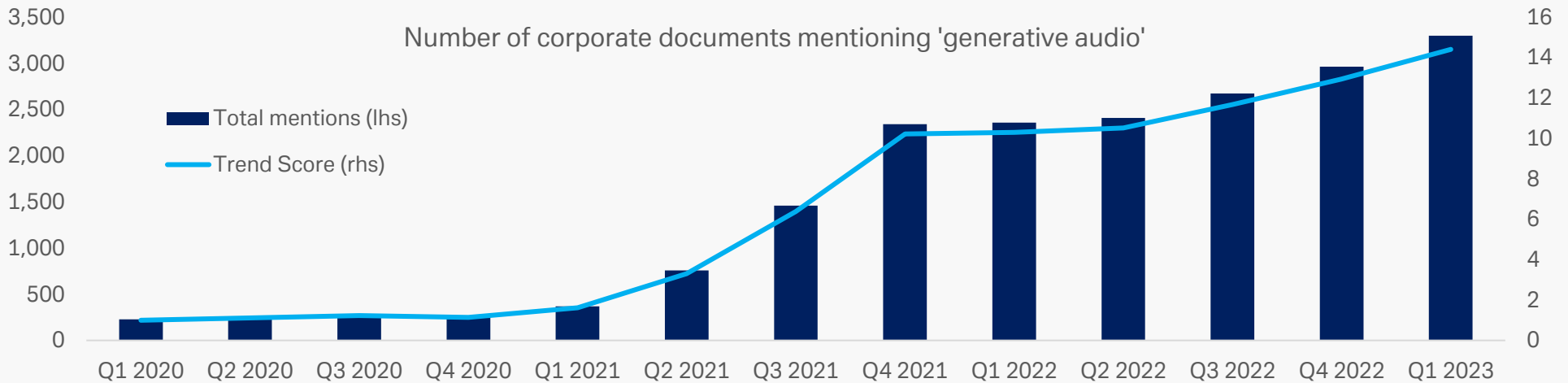
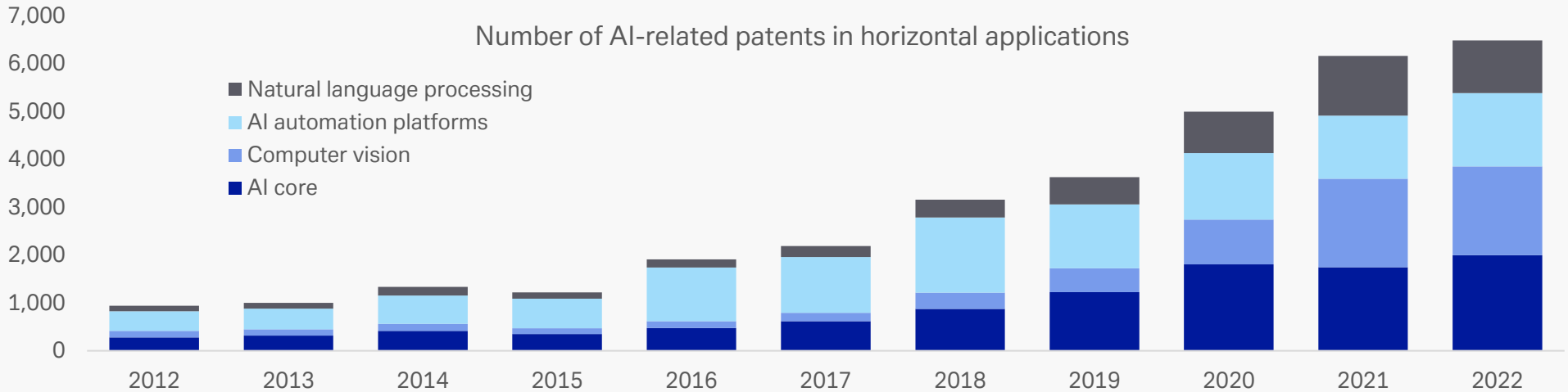


Source: "The AI Index 2023 Annual Report" by Institute for Human-Centered AI, Stanford University, citing data from NetBase Quid, 2022, on AI startups that have received more than \$1.5m in investment since 2013



## 6.1. What more could there be to come?

Leading indicators such as patents and corporate documents point to an upcoming surge in rollouts of new AI uses in areas such as natural language processing, computer vision and generative audio

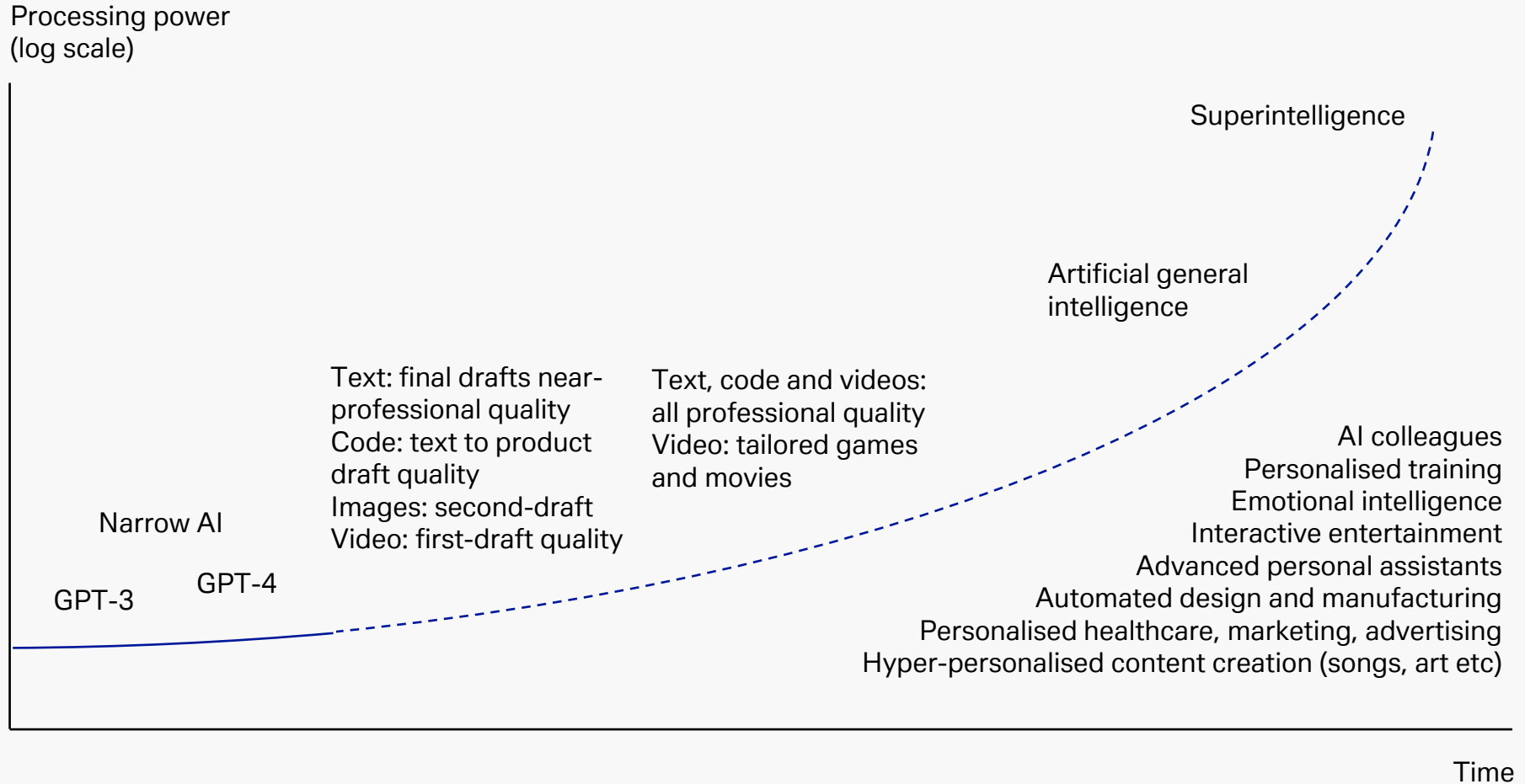


Source: World Intellectual Property Organization, AlphaSense, Deutsche Bank.



## 6.2. What if this is just the beginning?

Future uses might be multi-modal and involve hyper-personalised content and services on the way to superintelligence



Source: Deutsche Bank.

# Appendix 1

## Important Disclosures

### \*Other Information Available upon Request



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Macroeconomic fluctuations often account for most of the risks associated with exposures to instruments that promise to pay fixed or variable interest rates. For an investor who is long fixed-rate instruments (thus receiving these cash flows), increases in interest rates naturally lift the discount factors applied to the expected cash flows and thus cause a loss. The longer the maturity of a certain cash flow and the higher the move in the discount factor, the higher will be the loss. Upside surprises in inflation, fiscal funding needs, and FX depreciation rates are among the most common adverse macroeconomic shocks to receivers. But counterparty exposure, issuer creditworthiness, client segmentation, regulation (including changes in assets holding limits for different types of investors), changes in tax policies, currency convertibility (which may constrain currency conversion, repatriation of profits and/or liquidation of positions), and settlement issues related to local clearing houses are also important risk factors. The sensitivity of fixed-income instruments to macroeconomic shocks may be mitigated by indexing the contracted cash flows to inflation, to FX depreciation, or to specified interest rates – these are common in emerging markets. The index fixings may – by construction – lag or mis-measure the actual move in the underlying variables they are intended to track. The choice of the proper fixing (or metric) is particularly important in swaps markets, where floating coupon rates (i.e., coupons indexed to a typically short-dated interest rate reference index) are exchanged for fixed coupons. Funding in a currency that differs from the currency in which coupons are denominated carries FX risk. Options on swaps (swaptions) the risks typical to options in addition to the risks related to rates movements.

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