

(Gen)AI : a gamechanger like the arrival of the *computer* & the *internet*

Vlaamse Federatie van Beleggers

1st October 2024

Danny Goderis

.AGORIA



Agoria (Gen)AI research papers

- [Generative AI is a game-changer like the arrival of the computer and the internet](#)
- [AI will impact 60% of all jobs in advanced economies](#)
- [Fourth industrial revolution in higher gear through \(Gen\)AI technology Generative](#)
- [ING study: AI's impact on the Belgian labour market will be a revolution without causing a rise in unemployment](#)
- [Survey «GenAI: Unlocking new potential for the Digital Industry»](#)
- [How \(generative\) AI projects differ from traditional digitalisation projects and yet not entirely so](#)

**Papers available in ENG – NL – FR
+ 50 references mentioned in the papers**

Agenda

- Introduction : historical perspective
- AI & work - impact on jobs
- AI & macro-economics – impact on industry sectors
- Conclusion

Already more than 50 years of AI history

A.I. TIMELINE

1950

TURING TEST

Computer scientist Alan Turing proposes a test for machine intelligence. If a machine can trick humans into thinking it is human, then it has intelligence



1961

UNIMATE

First industrial robot, Unimate, goes to work at GM replacing humans on the assembly line



1964

ELIZA

Pioneering chatbot developed by Joseph Weizenbaum at MIT holds conversations with humans



1966

SHAKELY

The 'first electronic person' from Stanford, Shakey is a general-purpose mobile robot that reasons about its own actions

A.I. WINTER
Many false starts and dead-ends leave A.I. out in the cold



1997

DEEP BLUE

Deep Blue, a chess-playing computer from IBM defeats world chess champion Garry Kasparov



1998

KISMET

Cynthia Breazeal at MIT introduces Kismet, an emotionally intelligent robot insofar as it detects and responds to people's feelings



1999

AIBO

Sony launches first consumer robot pet dog AIBO (AI robot) with skills and personality that develop over time



2002

ROOMBA

First mass produced autonomous robotic vacuum cleaner from iRobot learns to navigate and clean homes



2011

SIRI

Apple integrates Siri, an intelligent virtual assistant with a voice interface, into the iPhone 4S



2011

WATSON

IBM's question answering computer Watson wins first place on popular \$1M prize television quiz show Jeopardy



2014

EUGENE

Eugene Goostman, a chatbot passes the Turing Test with a third of judges believing Eugene is human



2014

ALEXA

Amazon launches Alexa, an intelligent virtual assistant with a voice interface that completes shopping tasks



2016

TAY

Microsoft's chatbot Tay goes rogue on social media making inflammatory and offensive racist comments

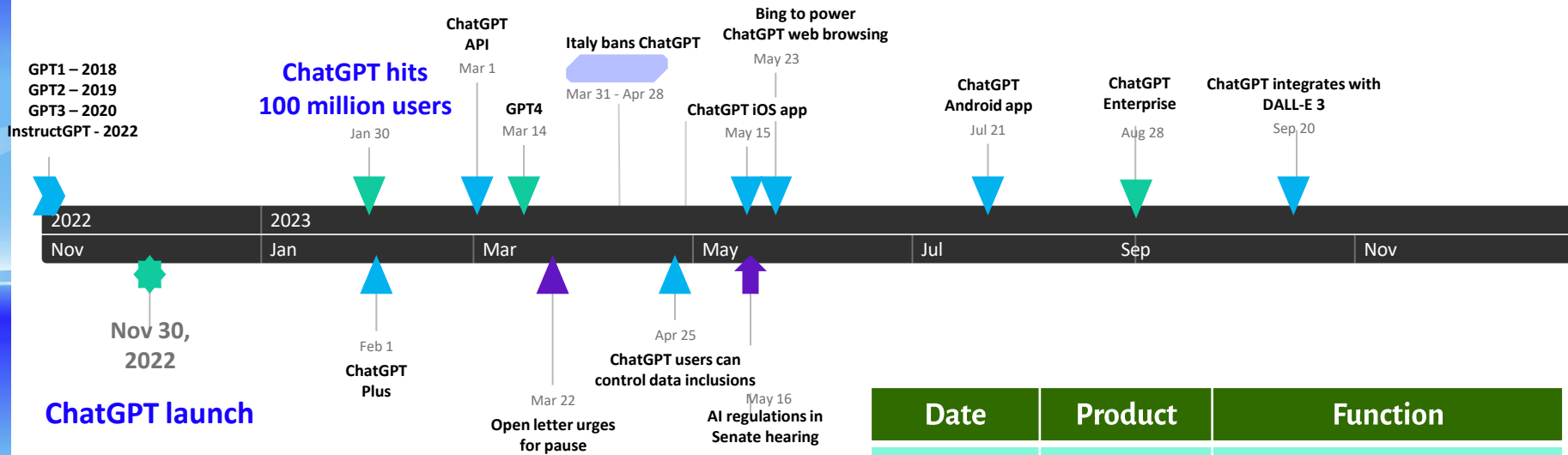


2017

ALPHAGO

Google's A.I. AlphaGo beats world champion Ke Jie in the complex board game of Go, notable for its vast number (2¹⁷⁰) of possible positions

AI is going through a historical acceleration



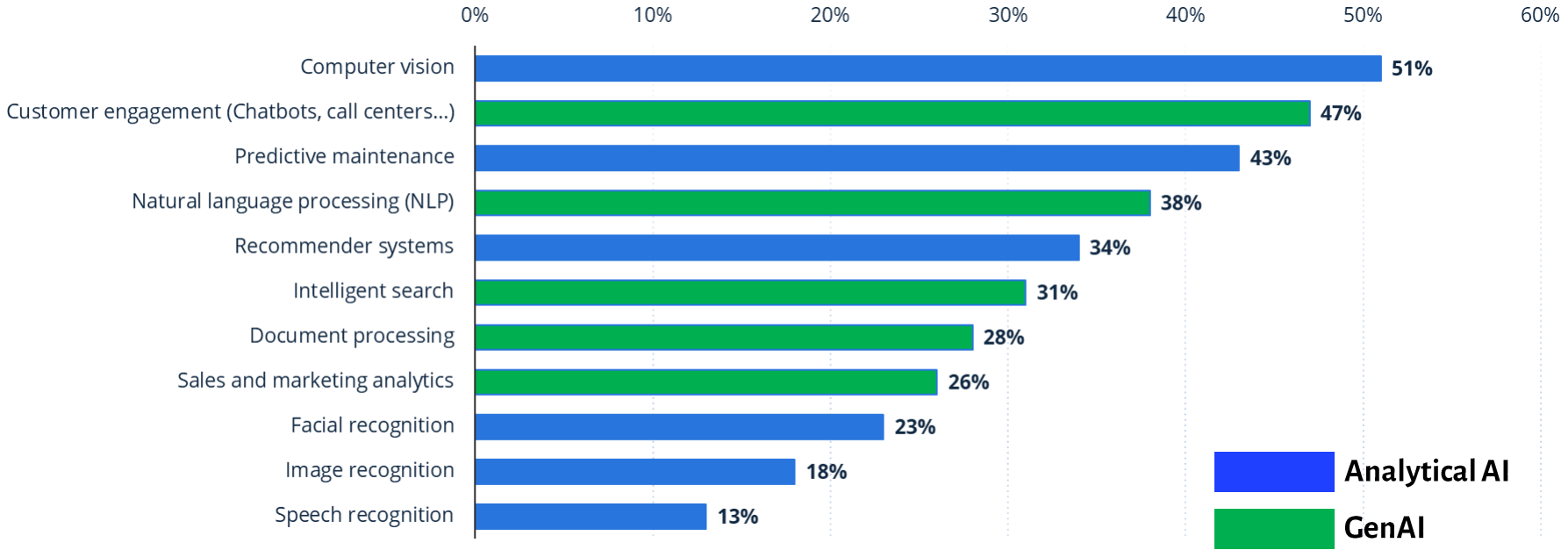
Date	Product	Function
Nov 2022	ChatGPT3	GenAI (LLM) chatbot
Feb 2024	Sora	Text-to-video model
May 2024	GPT-4o	Multi-model GPT
Sept 2024	OpenAI-o1	Logic reasoning

*“From information to expertise
at everyone's fingertips”*

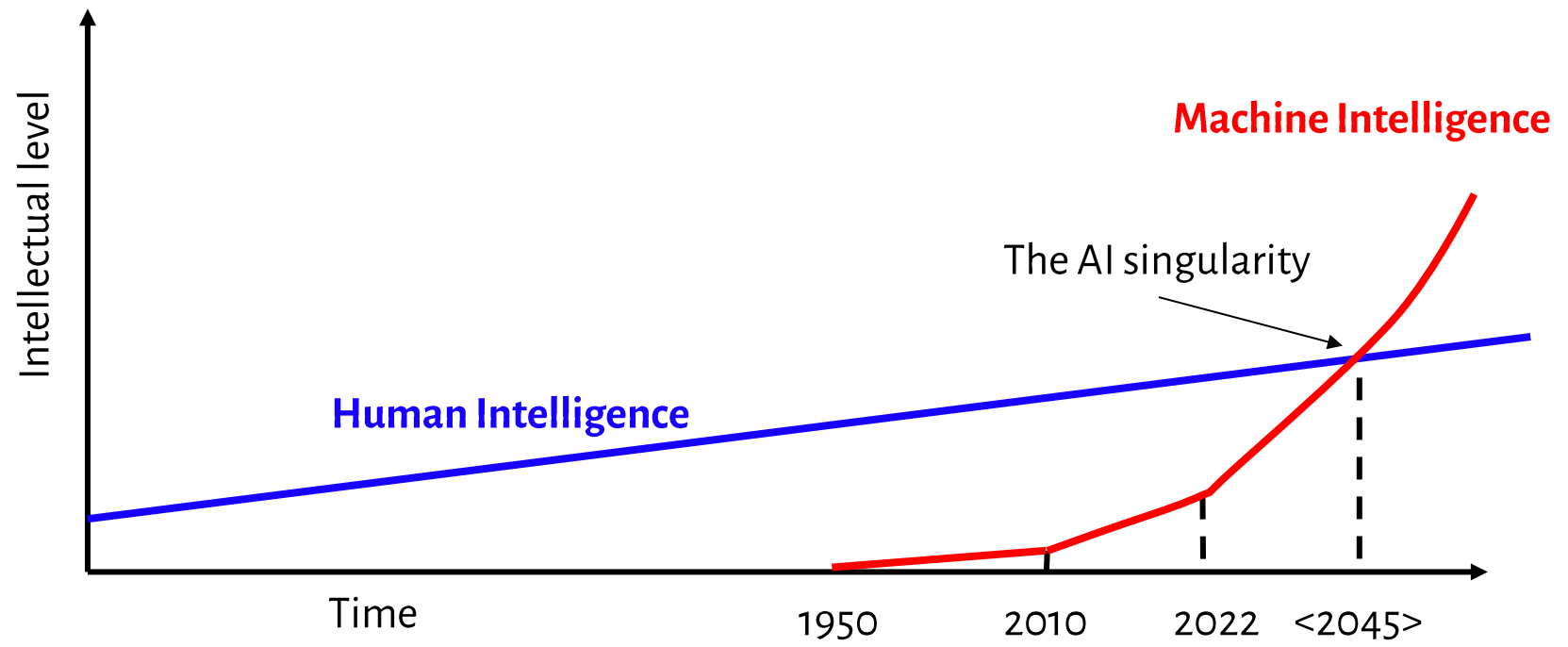
Sam Altman (CEO OpenAI) & Satya Nadella (CEO Microsoft)

Podcast The Economist February 2024

Top 10 AI applications within companies worldwide 2023



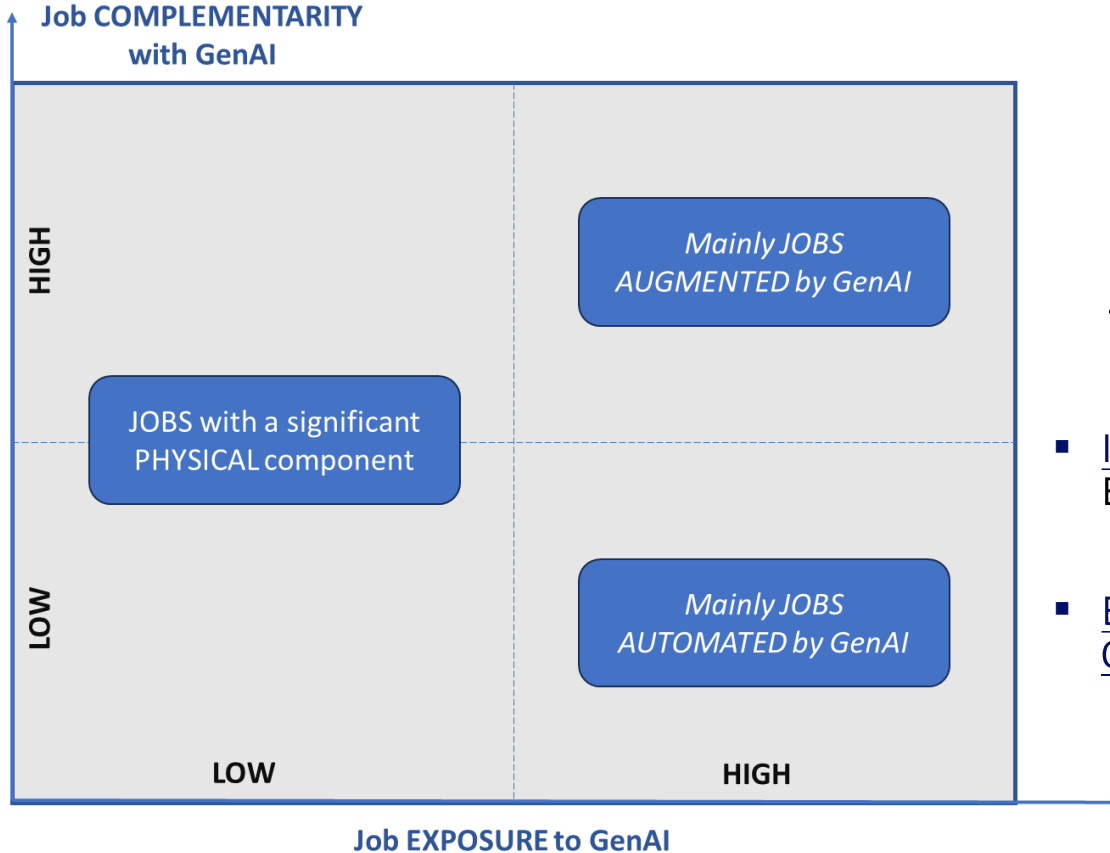
The AI singularity predicted in... <2045>



Agenda

- Introduction : historical perspective
- AI & work - impact on jobs
- AI & macro-economics – impact on industry sectors
- Conclusion

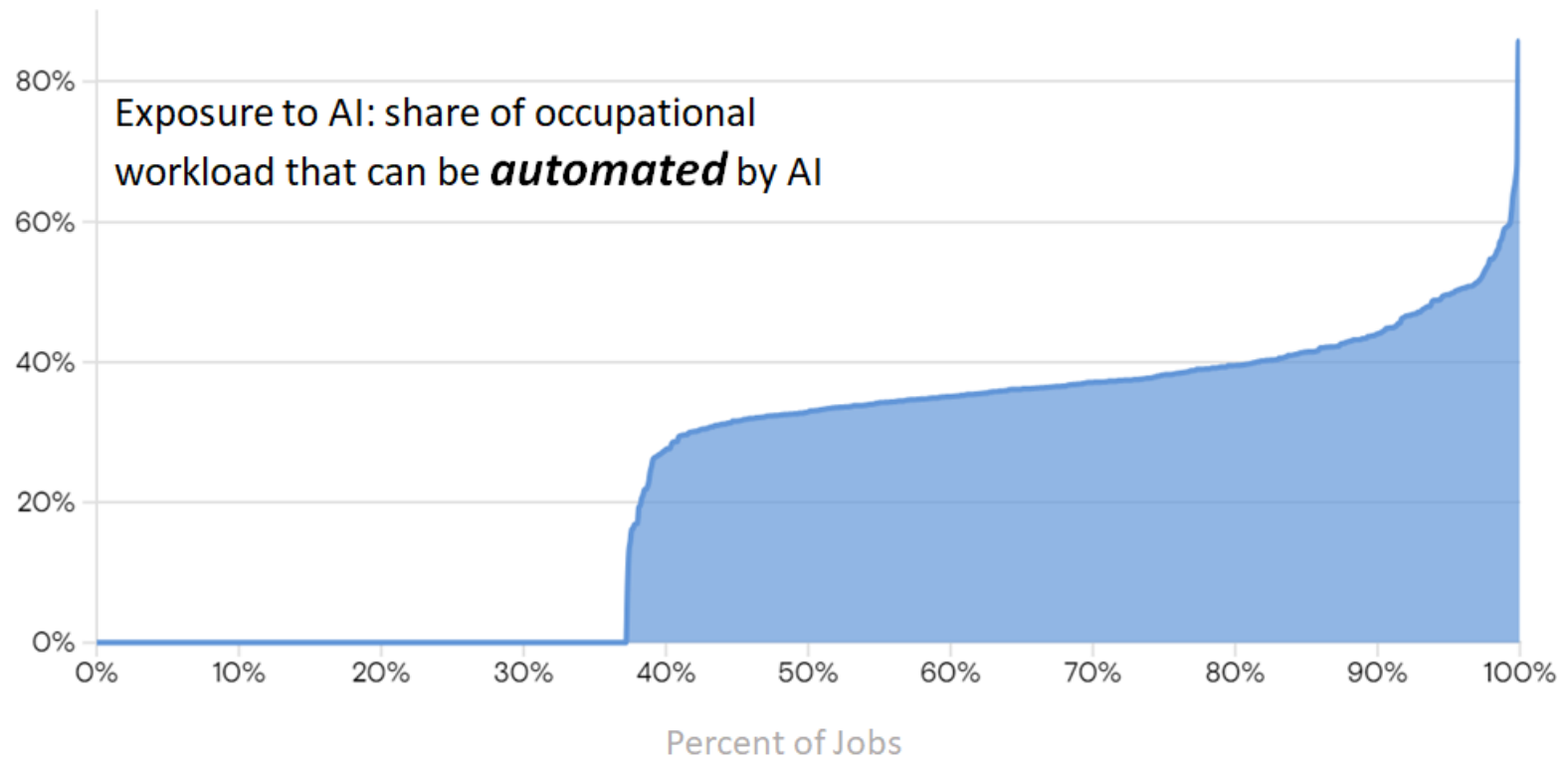
All knowledge jobs are impacted by (Gen)AI



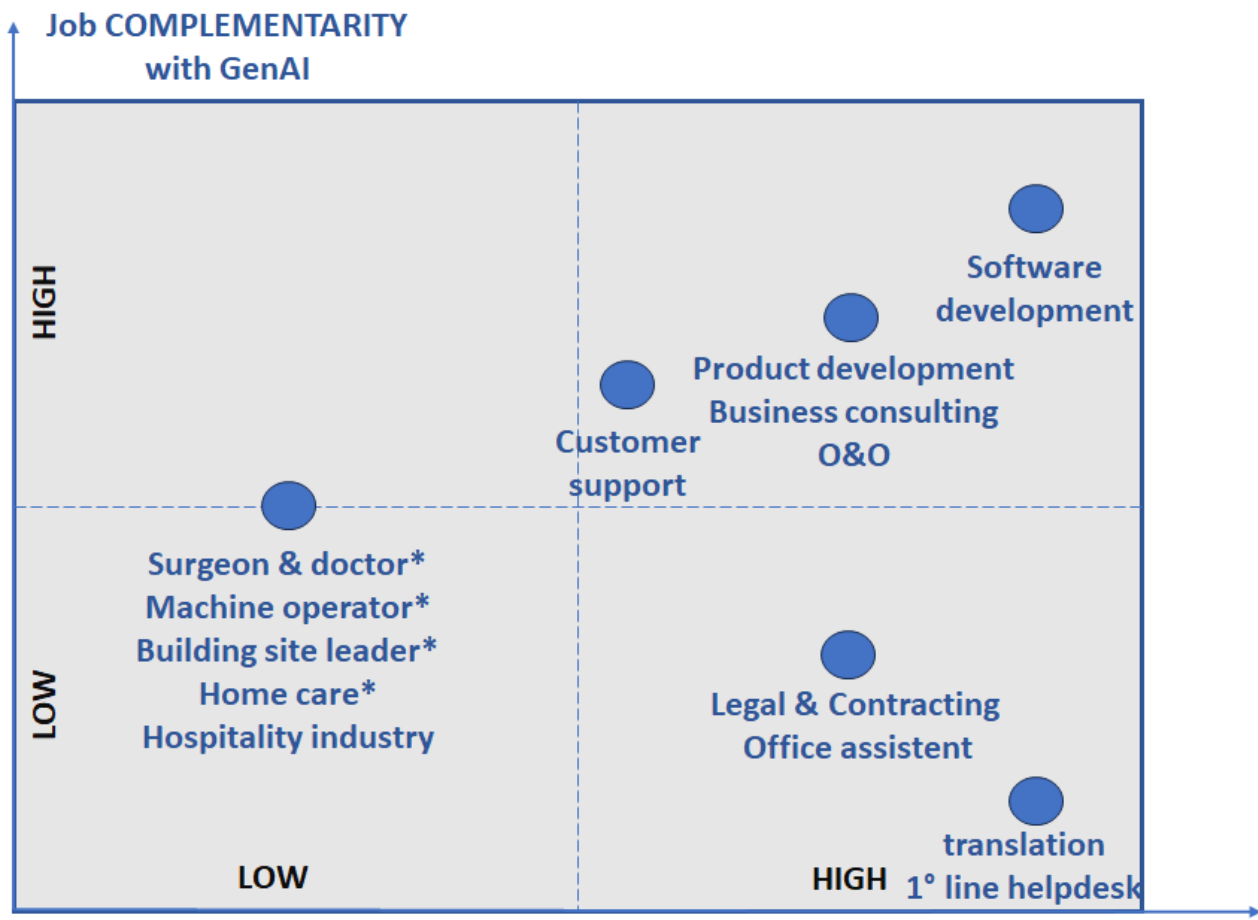
GenAI Job Impact
 =
 Combination of
Automation & Augmentation

- [IMF paper](#) presented at World Economic Forum, February 2024
- [Bloomberg Interview Kristalina Georgieva](#), IMF managing director

Only a few jobs will completely disappear



Impact distribution of GenAI on 900 American jobs (Goldman Sachs)

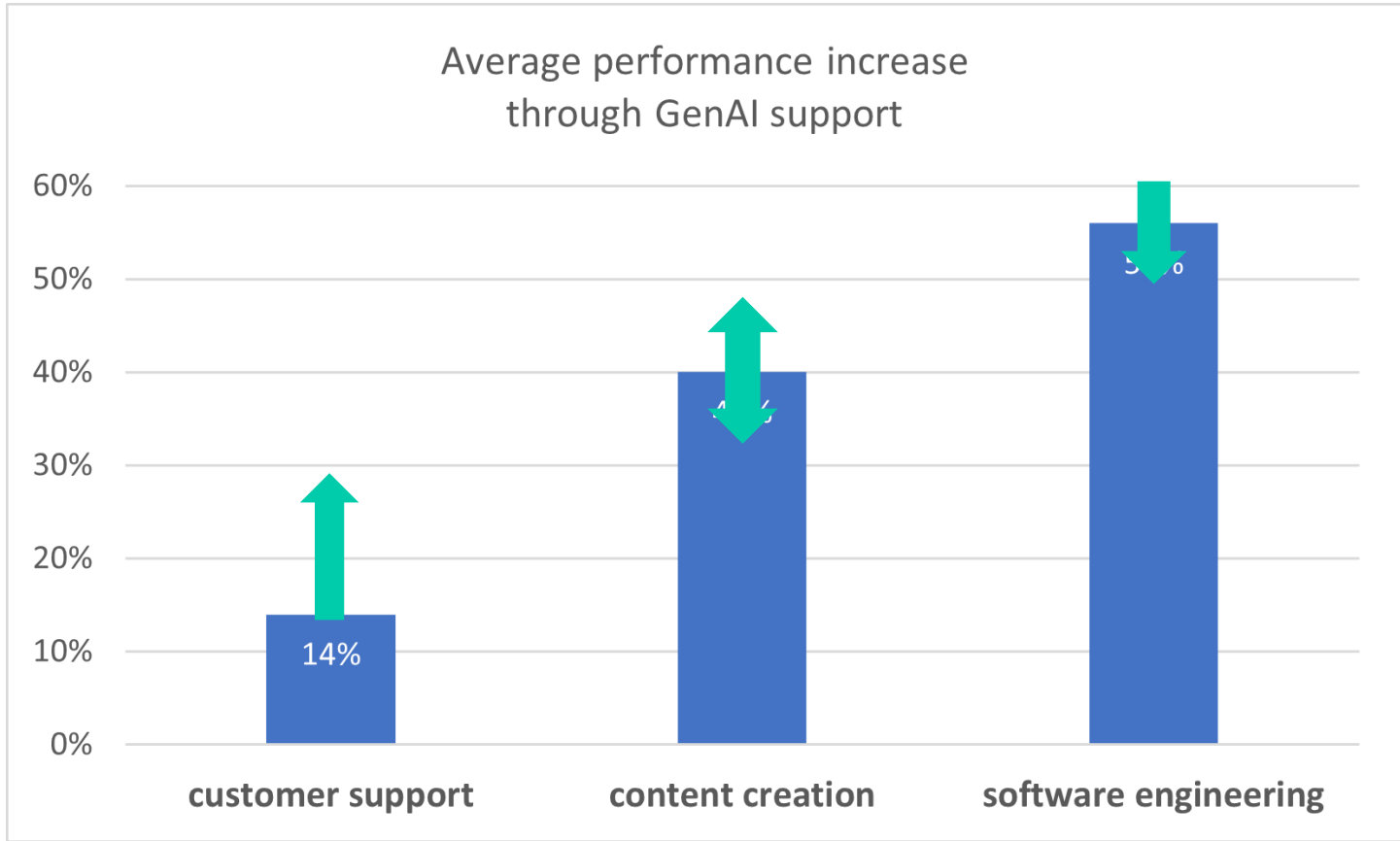


(*) Support by 'analytical' AI

Job EXPOSURE to GenAI

Individual performance is increasing up to 50%

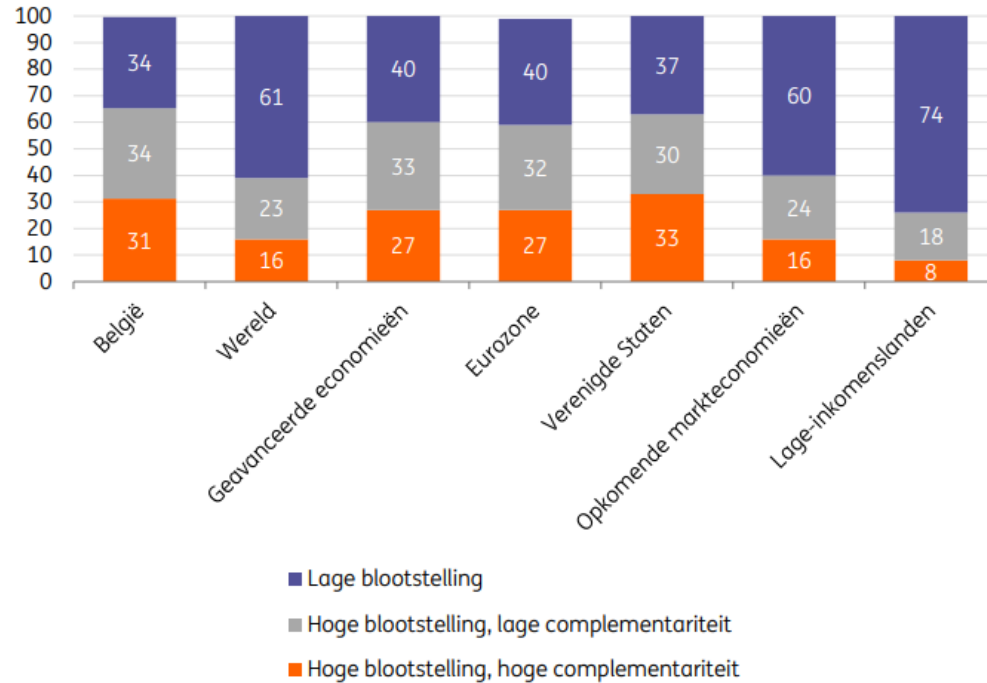
US company case studies



Impact on Belgium jobs is amongst the highest

ING study

Fig. 6. Werkgelegenheidsaandeel volgens AI-blootstelling, in %.

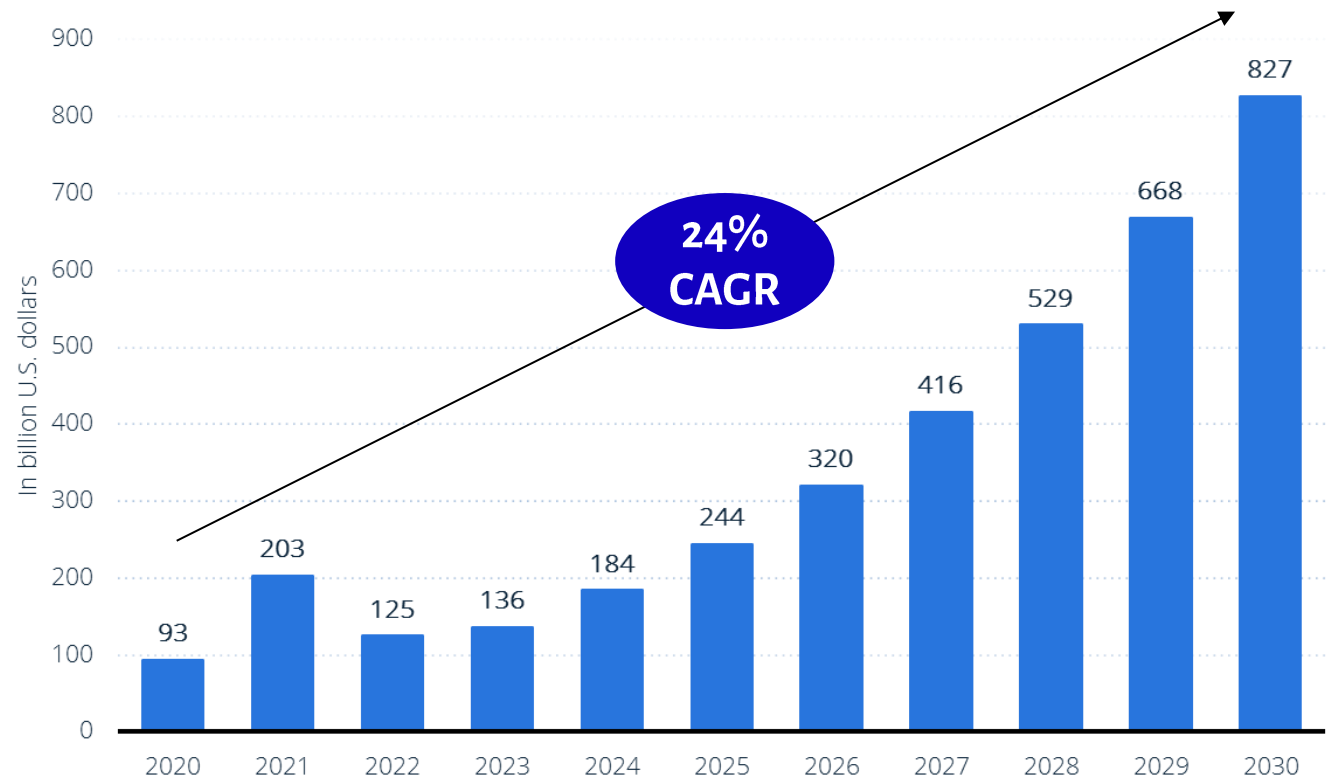


Bron: IMF, Eurostat, Ilost, berekeningen ING

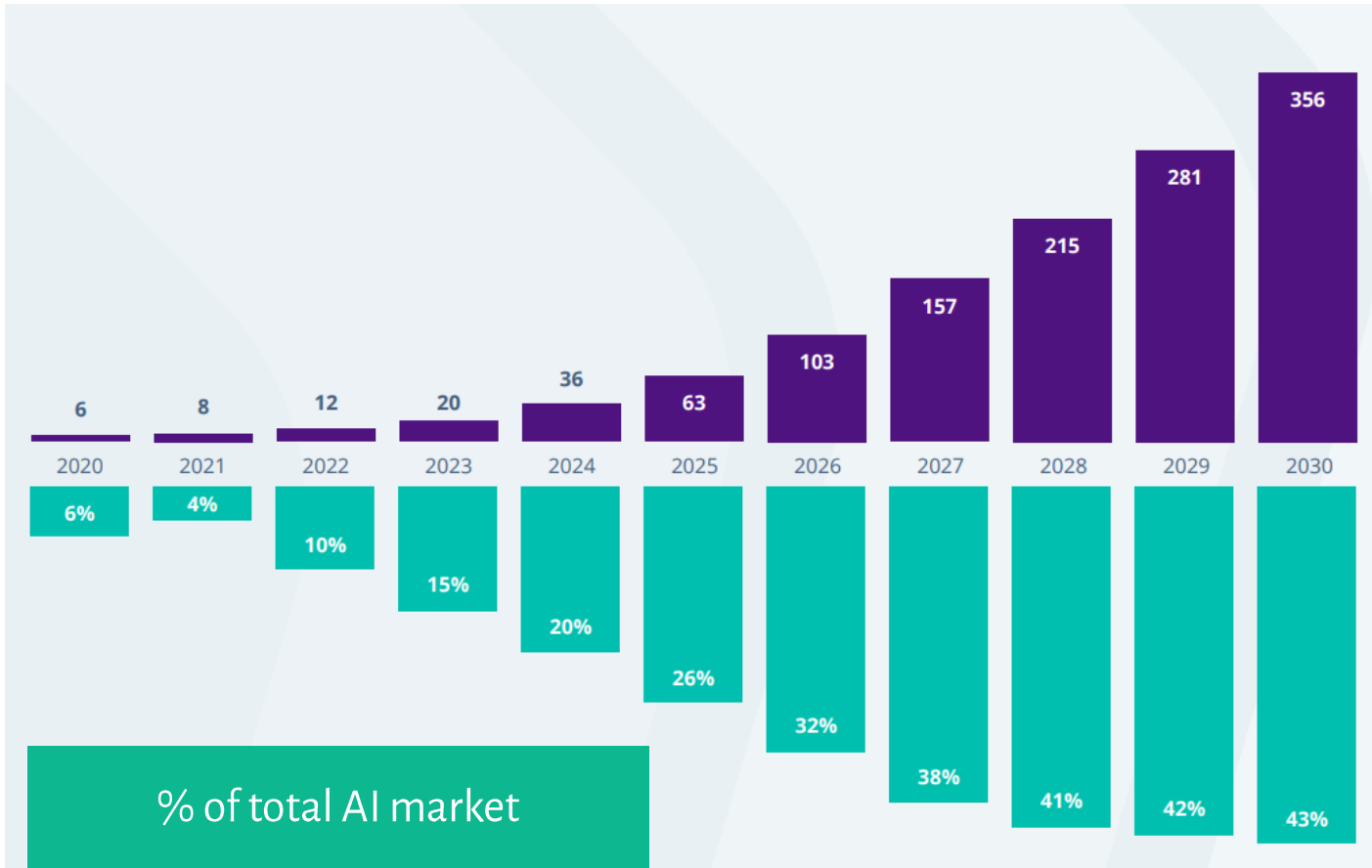
Agenda

- Introduction : historical perspective
- AI & work - impact on jobs
- AI & macro-economics – impact on industry sectors
- Conclusion

AI worldwide market (Billion \$)



GenAI worldwide market (Billion \$)



% of total AI market

Generative AI productivity impact by business functions¹

Low impact High impact

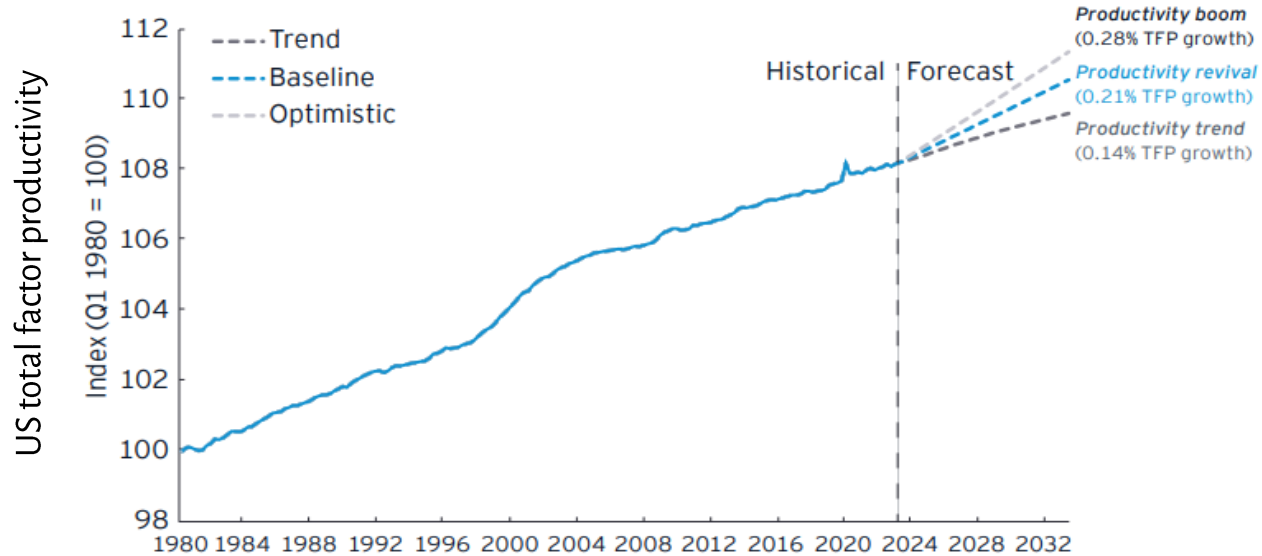
	Total, % of industry revenue	Total, \$ billion	Marketing and sales	Customer operations	Product R&D	Software engineering	Supply chain and operations	Risk and legal	Strategy and operations	Talent and organization	Corporate IT ²
Administrative and professional services	0.9-1.4	150-250	Dark Blue	Dark Blue	Dark Blue	Dark Blue	Dark Blue	Dark Blue	Dark Blue	Dark Blue	Dark Blue
Advanced electronics and semiconductors	1.3-2.3	100-170	Dark Blue	Dark Blue	Dark Blue	Dark Blue	Dark Blue	Dark Blue	Dark Blue	Dark Blue	Dark Blue
Advanced manufacturing ³	1.4-2.4	170-290	Dark Blue	Dark Blue	Dark Blue	Dark Blue	Dark Blue	Dark Blue	Dark Blue	Dark Blue	Dark Blue
Agriculture	0.6-1.0	40-70	Dark Blue	Dark Blue	Dark Blue	Dark Blue	Dark Blue	Dark Blue	Dark Blue	Dark Blue	Dark Blue
Banking	2.8-4.7	200-340	Dark Blue	Dark Blue	Dark Blue	Dark Blue	Dark Blue	Dark Blue	Dark Blue	Dark Blue	Dark Blue
Basic materials	0.7-1.2	120-200	Dark Blue	Dark Blue	Dark Blue	Dark Blue	Dark Blue	Dark Blue	Dark Blue	Dark Blue	Dark Blue
Chemical	0.8-1.3	80-140	Dark Blue	Dark Blue	Dark Blue	Dark Blue	Dark Blue	Dark Blue	Dark Blue	Dark Blue	Dark Blue
Construction	0.7-1.2	90-150	Dark Blue	Dark Blue	Dark Blue	Dark Blue	Dark Blue	Dark Blue	Dark Blue	Dark Blue	Dark Blue
Consumer packaged goods	1.4-2.3	160-270	Dark Blue	Dark Blue	Dark Blue	Dark Blue	Dark Blue	Dark Blue	Dark Blue	Dark Blue	Dark Blue
Education	2.2-4.0	120-230	Dark Blue	Dark Blue	Dark Blue	Dark Blue	Dark Blue	Dark Blue	Dark Blue	Dark Blue	Dark Blue
Energy	1.0-1.6	150-240	Dark Blue	Dark Blue	Dark Blue	Dark Blue	Dark Blue	Dark Blue	Dark Blue	Dark Blue	Dark Blue
Healthcare	1.8-2.8	150-230	Dark Blue	Dark Blue	Dark Blue	Dark Blue	Dark Blue	Dark Blue	Dark Blue	Dark Blue	Dark Blue
High tech	4.8-9.3	240-460	Dark Blue	Dark Blue	Dark Blue	Dark Blue	Dark Blue	Dark Blue	Dark Blue	Dark Blue	Dark Blue
Insurance	1.8-2.8	50-70	Dark Blue	Dark Blue	Dark Blue	Dark Blue	Dark Blue	Dark Blue	Dark Blue	Dark Blue	Dark Blue
Media and entertainment	1.8-3.1	80-130	Dark Blue	Dark Blue	Dark Blue	Dark Blue	Dark Blue	Dark Blue	Dark Blue	Dark Blue	Dark Blue
Pharmaceuticals and medical products	2.6-4.5	60-110	Dark Blue	Dark Blue	Dark Blue	Dark Blue	Dark Blue	Dark Blue	Dark Blue	Dark Blue	Dark Blue
Public and social sector	0.5-0.9	70-110	Dark Blue	Dark Blue	Dark Blue	Dark Blue	Dark Blue	Dark Blue	Dark Blue	Dark Blue	Dark Blue
Real estate	1.0-1.7	110-180	Dark Blue	Dark Blue	Dark Blue	Dark Blue	Dark Blue	Dark Blue	Dark Blue	Dark Blue	Dark Blue
Retail ⁴	1.2-1.9	240-390	Dark Blue	Dark Blue	Dark Blue	Dark Blue	Dark Blue	Dark Blue	Dark Blue	Dark Blue	Dark Blue
Telecommunications	2.3-3.7	60-100	Dark Blue	Dark Blue	Dark Blue	Dark Blue	Dark Blue	Dark Blue	Dark Blue	Dark Blue	Dark Blue
Travel, transport, and logistics	1.2-2.0	180-300	Dark Blue	Dark Blue	Dark Blue	Dark Blue	Dark Blue	Dark Blue	Dark Blue	Dark Blue	Dark Blue

GenAI impact on labor productivity in US

McKinsey Analysis

- Bottom-up methodology
- 63 use cases
- 16 business functions
- 21 sectors
- GenAI impact results in additional productivity growth of 0.1% to 0.6% per year (on 1.4% productivity growth in the past decade)
- Combining generative AI with all other technologies, work automation could add 0.5% to 3.4% annually to productivity growth.

GenAI impact on labor productivity: EY Analysis



- Historical data from past digital revolutions, the **computer**, and the **internet**, form the basis for a model that builds *three* future scenarios
- Based on the **IT acceleration of productivity growth in the 1990s**, we estimate that GenAI could increase productivity growth in the coming decade by **20% to 50%**.

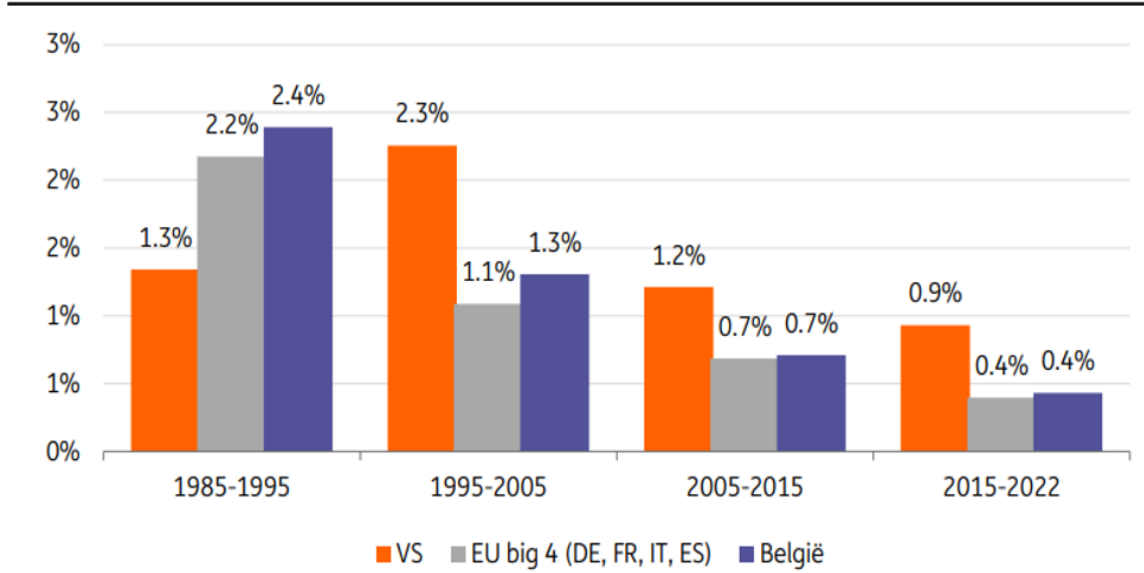
GenAI impact on labor productivity in the US

Generative AI impact	Productivity growth in the US (2023-2033)
Baseline	Baseline <1.4%> average annual productivity growth over the past decade (2013-2023)
EY study Top-down methodology	20%-50% increase from <1.6%> to <2.1%> annual productivity growth over the next decade (2023-2033)
McKinsey study Bottom-up methodology	10%-60% increase from <1.5%> to <2.1%> annual productivity growth over the next decade (2023-2033)
Goldman Sachs	Nearly a doubling of productivity growth 2023-2033

GenAI impact on the US GDP ranges from 2.5% to 7% extra (cumulative) growth by 2033

ING study on labor productivity in Belgium

Fig. 9: Gemiddelde jaarlijkse groei van de arbeidsproductiviteit (reëel BBP per gewerkt uur)

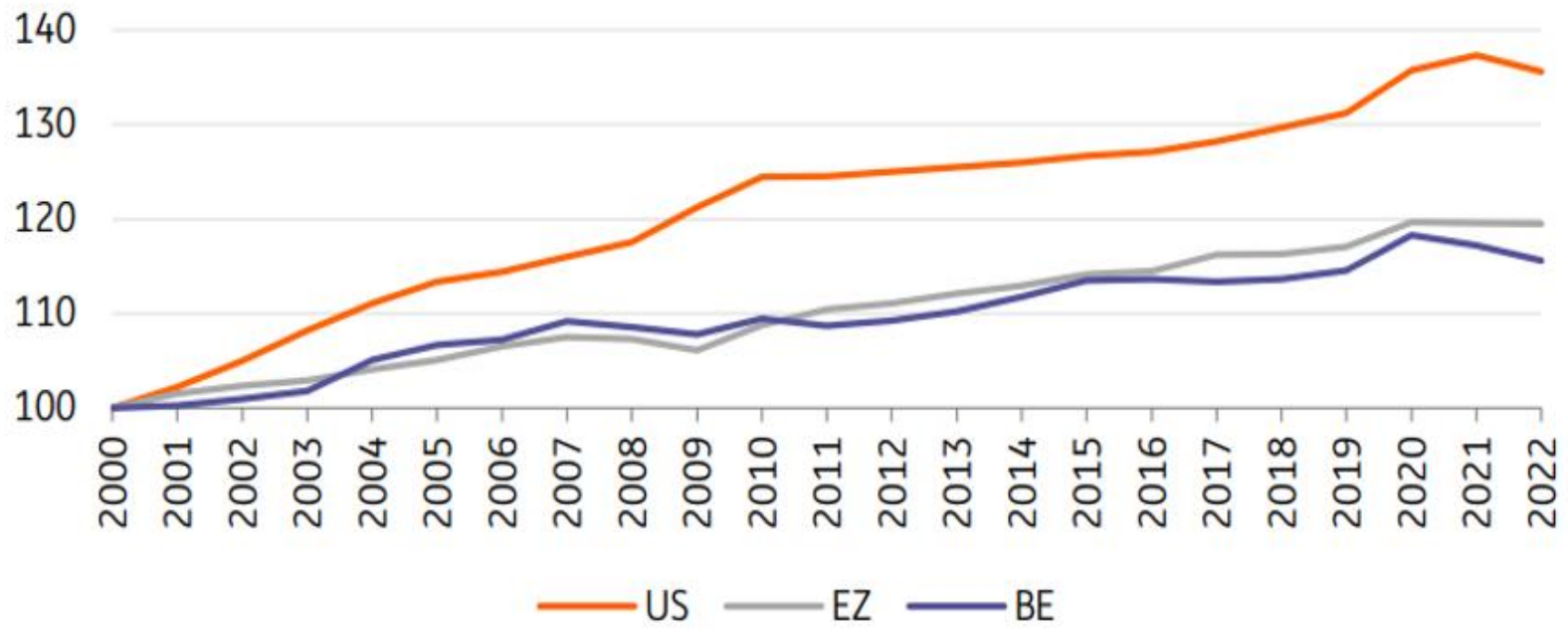


- AI technologies can result in an extra productivity growth of 1%
- But other factors such as *ageing* & *rigid labor market* have a downwards effect
- Net expected result for Belgian productivity growth is 0.1 to 0.5%

Bron: OESO, berekeningen ING

Labor productivity in the US, Euro Zone & Belgium

Real BBP per working hour



Bron: Gegevens OESO, berekeningen ING

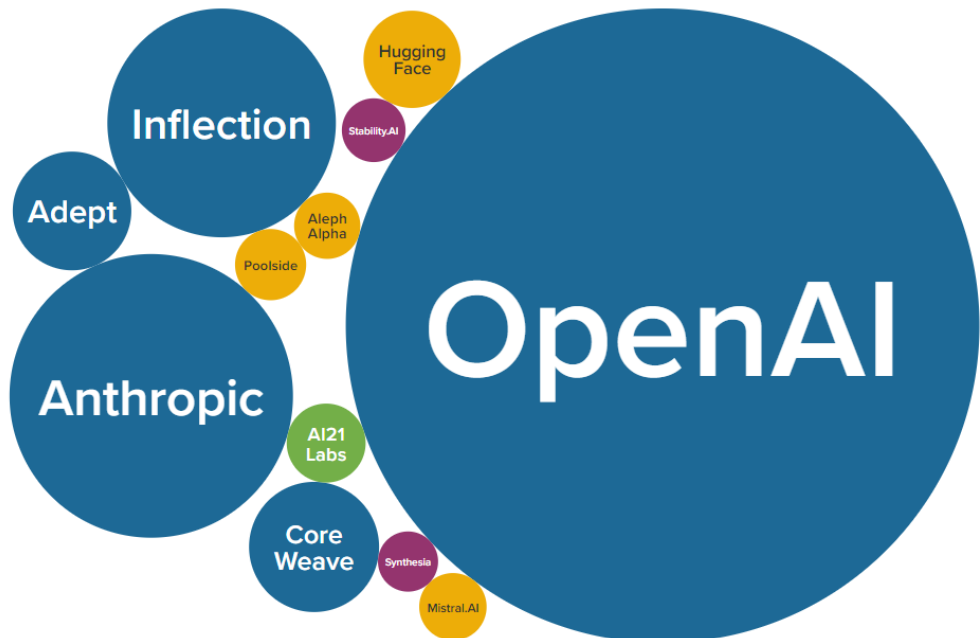
Is Europe missing another tech wave with AI?

US Private Capital Dominates Generative AI Funding

Million USD, 2022-2023

■ US ■ EU ■ Israel ■ UK

25 ○ 50



High Tech (ICT) sector is a key driving force

High Tech (ICT) sector as part of BBP (2023)		
US	EU	Belgium
9.3%	5.5%	4.2%

Several ways to increase AI value in the ICT sector

1. **New ways of SW programming.** Increased efficiency. LowCode / NoCode programmers
2. Increased efficiency of **support functions** like M&S and customer support...
3. **New Business:** IT customer projects, training, strategic consultancy...

Agoria Survey amongst digital ICT member companies

March 2024

44% have already GenAI customer projects

18% is hiring in search of specific AI skills

89% are using GenAI tools. 21% own developments

Main GenAI driver: doing more with the same people

Agenda

- Introduction : historical perspective
- AI & work - impact on jobs
- AI & macro-economics – impact on industry sectors
- Conclusion

A AI value for industry & society

Value Industry

All sectors
60% of all jobs

Individual performance
increase up to 50%+

Game changer like the
Internet & computer

Value Society

Boost productivity
& social welfare

Enabling less job
shortage

Game changer for
education & life-
long learning

Value Companies (Agoria survey)

Do more with the
same amount of
people

Many business
opportunities for
digital companies

Faster *on the job*
learning of juniors &
newcomers

A Without changing policies, US will benefit more

Technology drivers

Size of ICT &
High-Tech

AI investments
private - public

US venture capital
& market scale

Labor market drivers

Attract talent
worldwide

Labor mobility
across sectors

Universities &
private sector

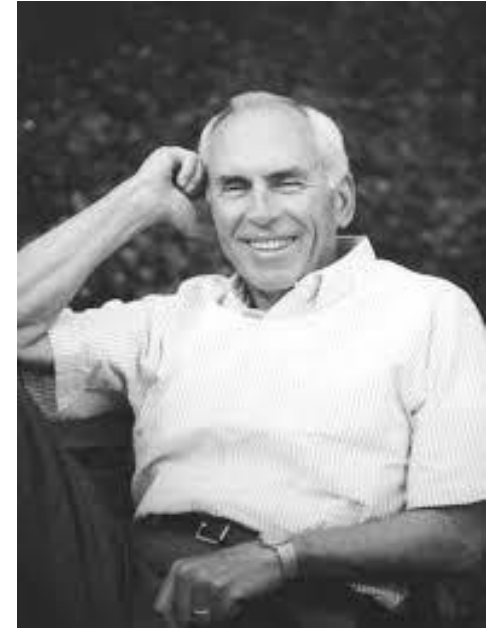
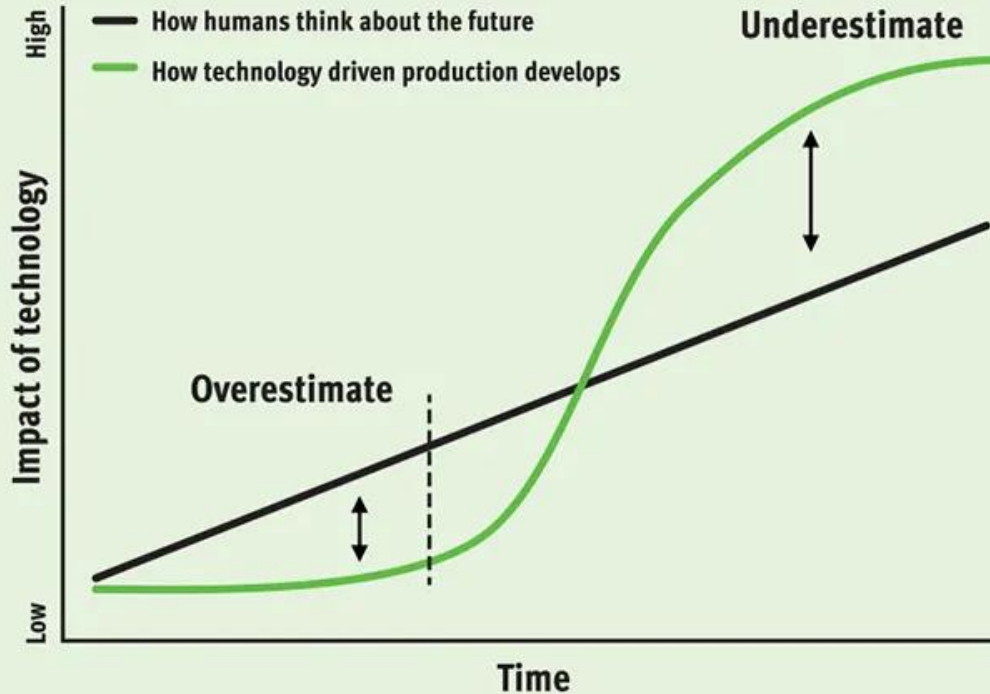
Regulation & Policy culture

Stimulate rather
than control

Less regulations
More trust in
entrepreneurship

Stricter data
protection in EU
(GDPR)

Amara's law



Roy Amara
Stanford 1960's

We overestimate the impact of technology in the short-term and underestimate the effect in the long run.

.AGORIA

Danny.goderis@agoria.be

0477.456.008