DESIGNED FOR YOUR WORLD

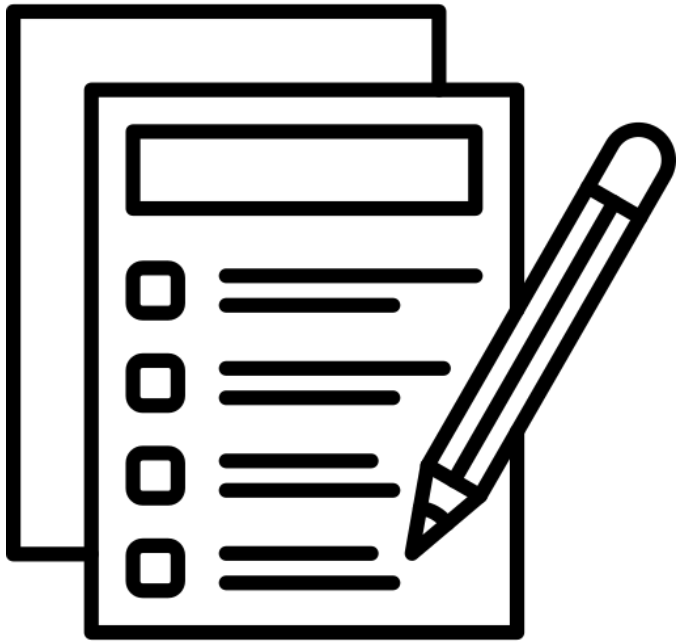
SDA Bocconi
SCHOOL OF MANAGEMENT

Banche e Assicurazioni intelligenti, artificiali e relazionali

17 Marzo 2025

Carlo Alberto Carnevale-Maffè
SDA Bocconi School of Management

TEMI DI DISCUSSIONE



- L'intelligenza artificiale come elemento di svolta per gli intermediari finanziari
- L'intelligenza artificiale come strumento per il ri-apprendimento di un nuovo linguaggio per la relazione con i clienti
- Implicazioni per le competenze e i processi organizzativi di banche e compagnie assicurative

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Professor of Strategy and Entrepreneurship at SDA Bocconi School of Management, Bocconi University, where it has been director of the Master in Strategy. He also taught at MBA and Executive Programs with Wharton School, New York University - Stern School of Business, HEC Paris, Steinbeis University Berlin, IMI New Delhi, Korea University Business School, St. Mary's College of California, Columbia Business School.

He is strategy adviser and independent director of leading international companies in technology and finance, some of them listed on Euronext stock exchange. He is independent director of United Ventures, a high-tech venture capital fund, and Foolfarm, start-up studio for artificial intelligence. He is president of "Fondazione Riccagioia" (genetic and agrifoodtech research), ASM Energia (A2A Group) and Smart Bank / Cirdan Capital, a London-based digital platform for investment management. He has been member of the board of ABI Lab, research consortium of Italian Banking Association. He has been serving as scientific adviser to Euroconsumers Association, CEFRIEL - Politecnico of Milan, Confindustria (ANIE, ASSOMAC, Assolombarda) and Confapi. He has been member of the Data-Driven Task Force of Italian Government for the COVID-19 pandemic, within the eHealth Network of European Commission. He served in many editorial boards of management journals (e.g. Harvard Business Review Italy). He collaborates as columnist and op-ed author for financial newspapers and televisions, and he's economic commentator for Mediaset.

Prezzo, prodotto e processo stanno cambiando…

Siete pronti ad affrontare il nuovo scenario?

1) IL PREZZO

- Geopolitical Uncertainty & Central Bank Dominance by Monetary Policy (and Invasive Supervision…)

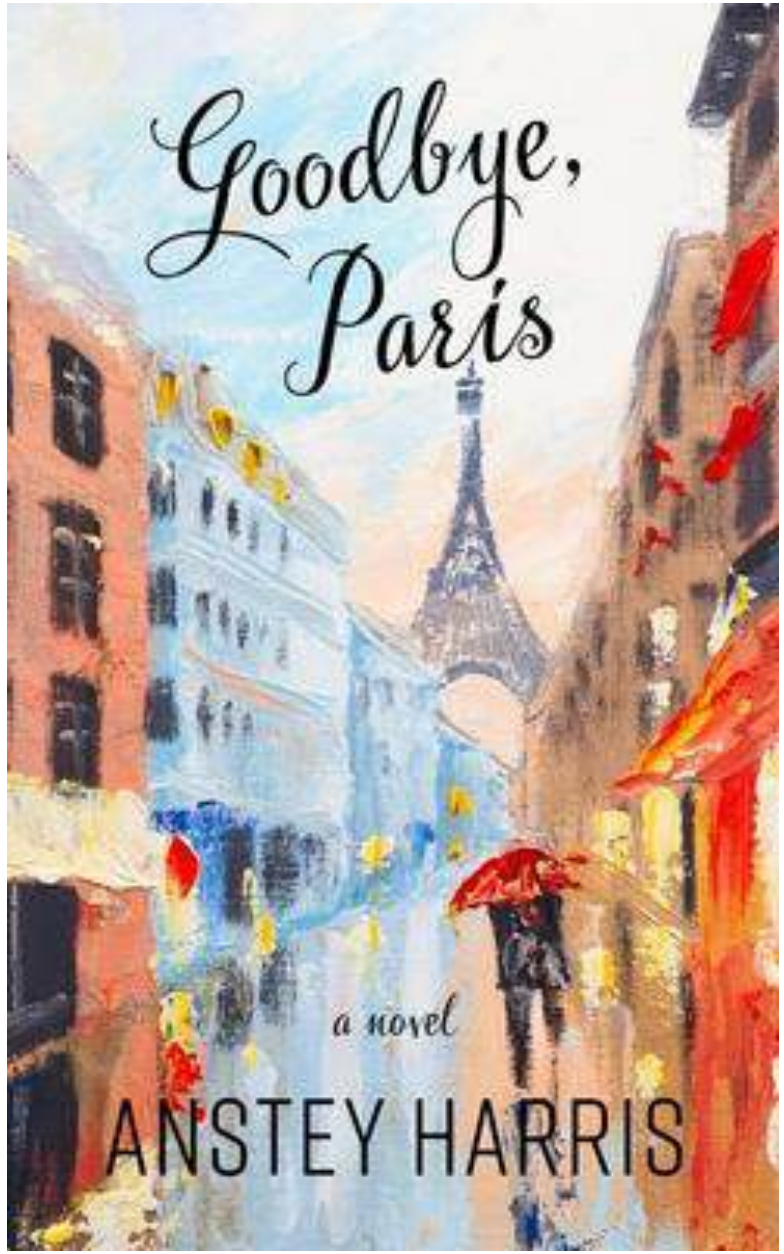
2) IL PRODOTTO

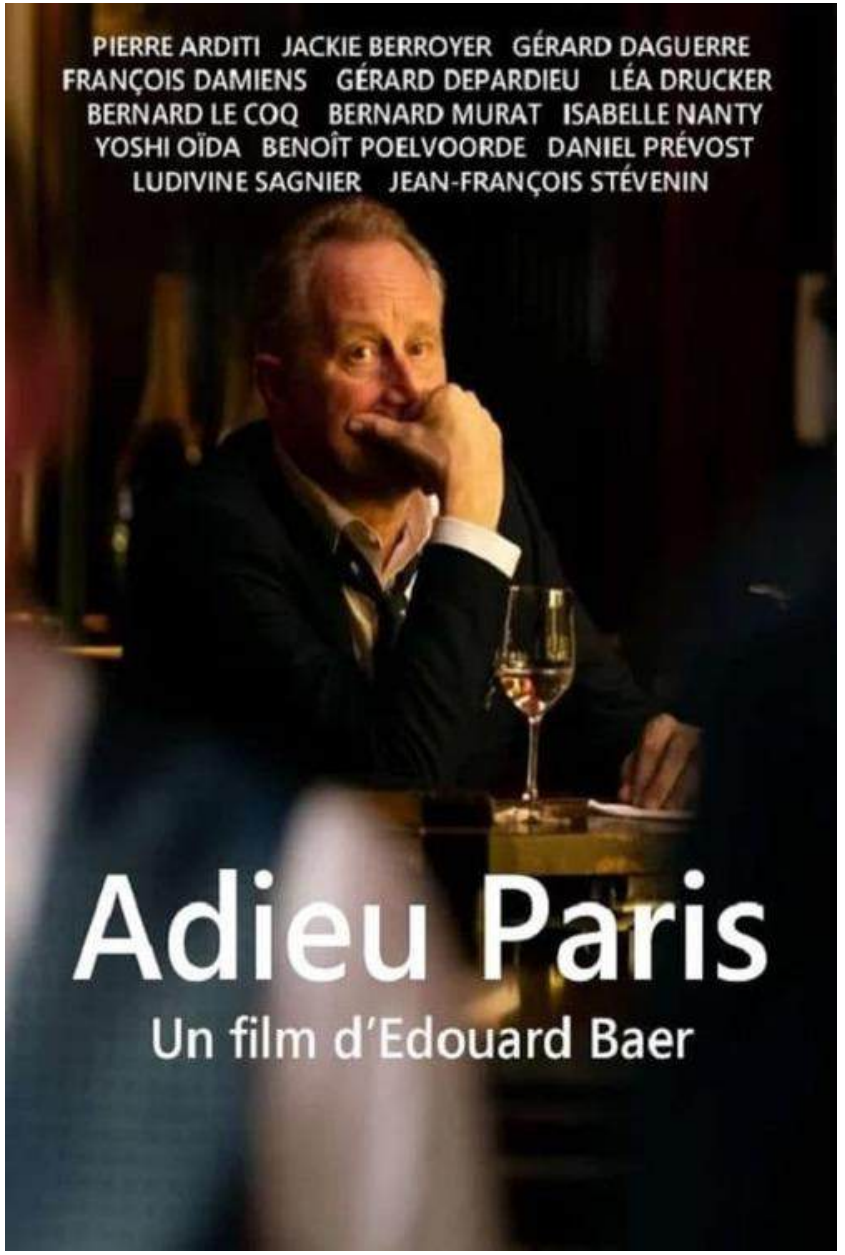
- CBDCs are changing the nature of payments and lending

3) IL PROCESSO

- The impact of Generative Artificial Intelligence on banks' & insurances' organizational structure

Donald vs. Greta





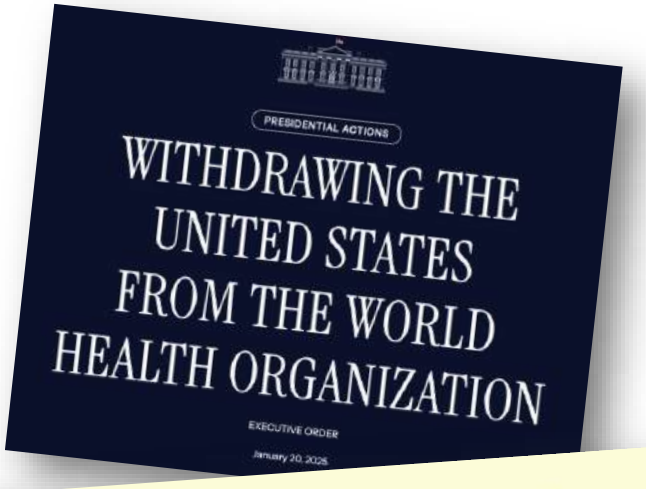
Goodbye, Paris…

UNITED NATIONS
PARIS CLIMATE
AGREEMENT

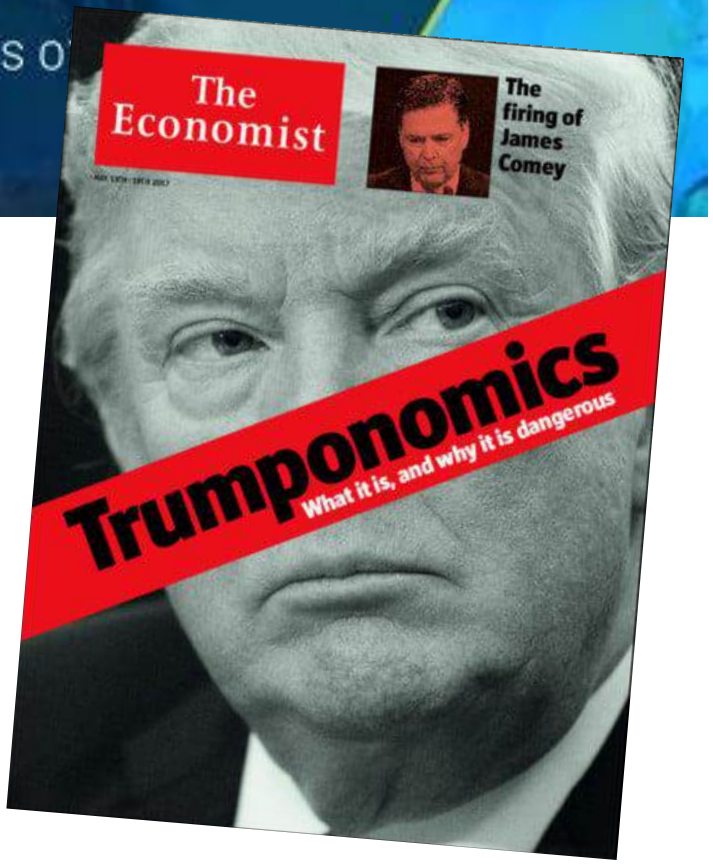
Trumponomics 2.0

«It looks like it's going to be extremely disruptive, it's going to be a big change and, probably, according to a lot of estimates, higher inflation»

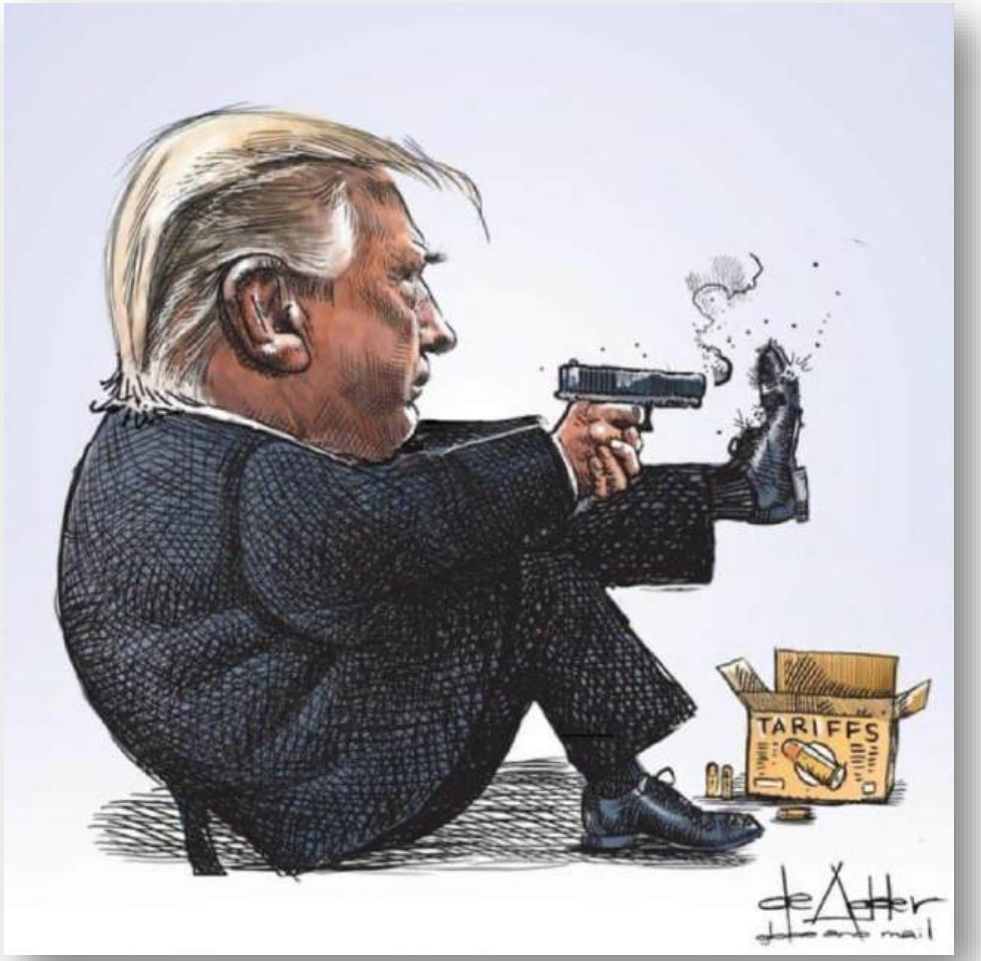
J. Politi, Financial Times

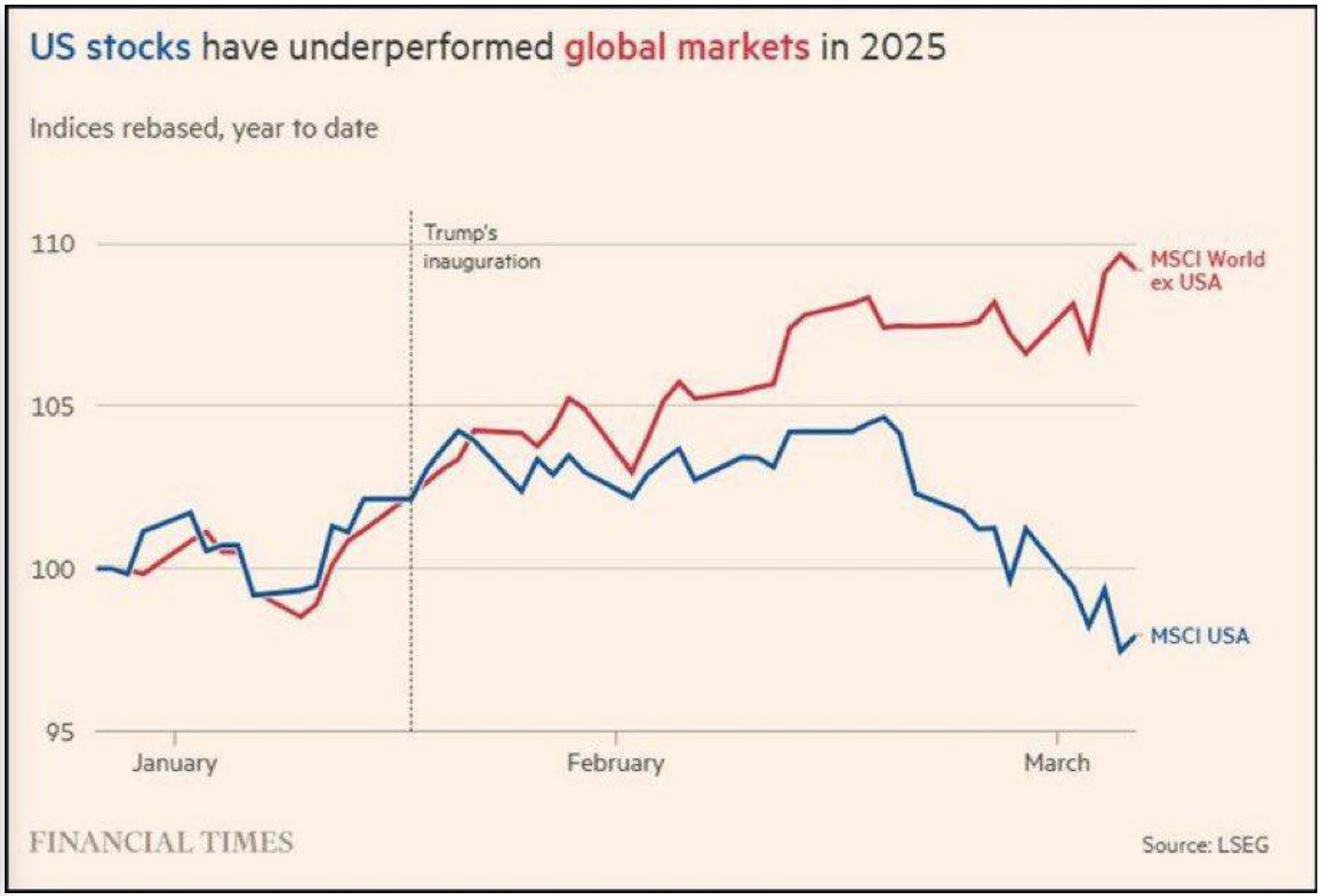


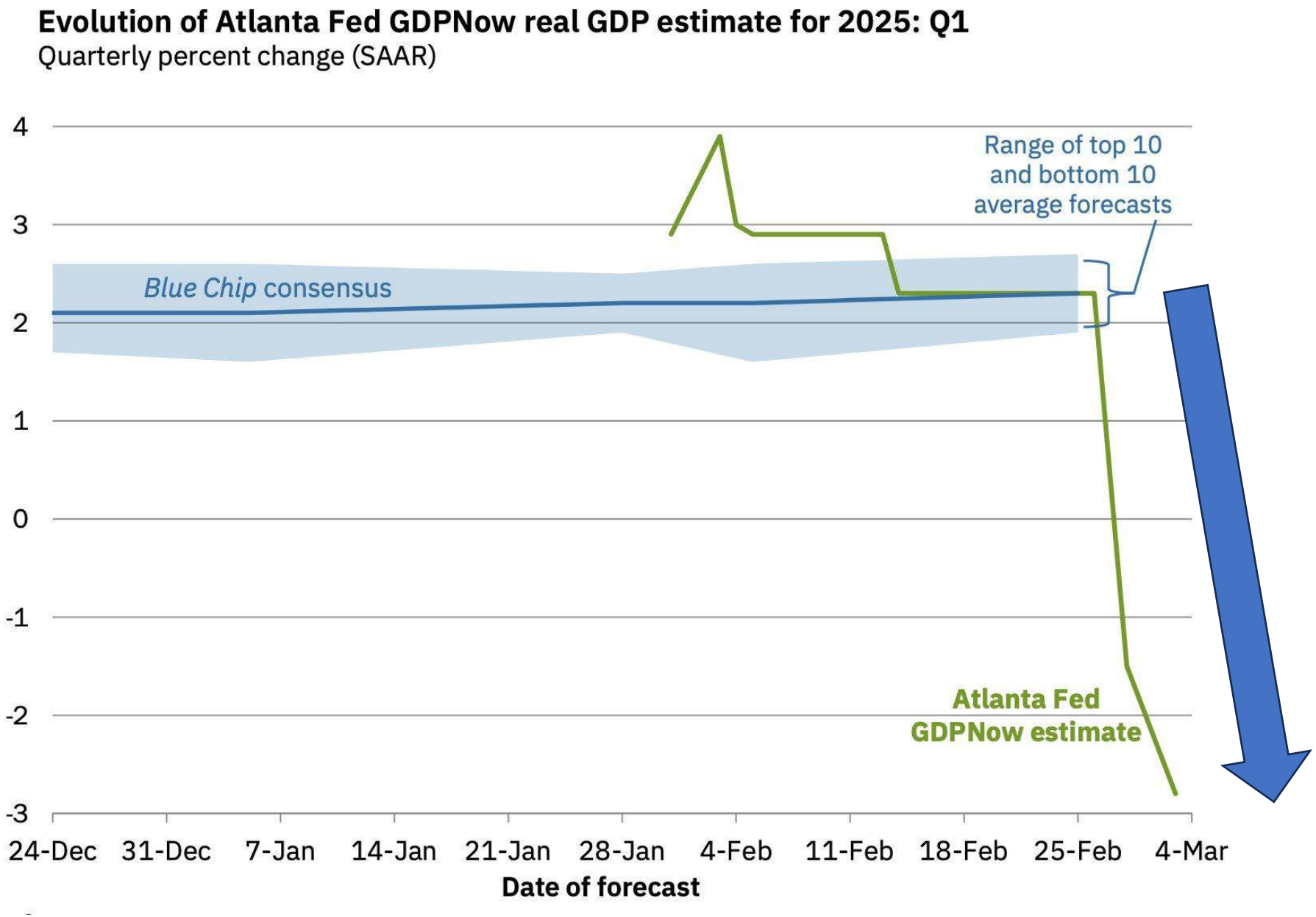
Trump vows to leave Paris climate agreement and 'drill, baby, drill'



Make America Shoot Again…







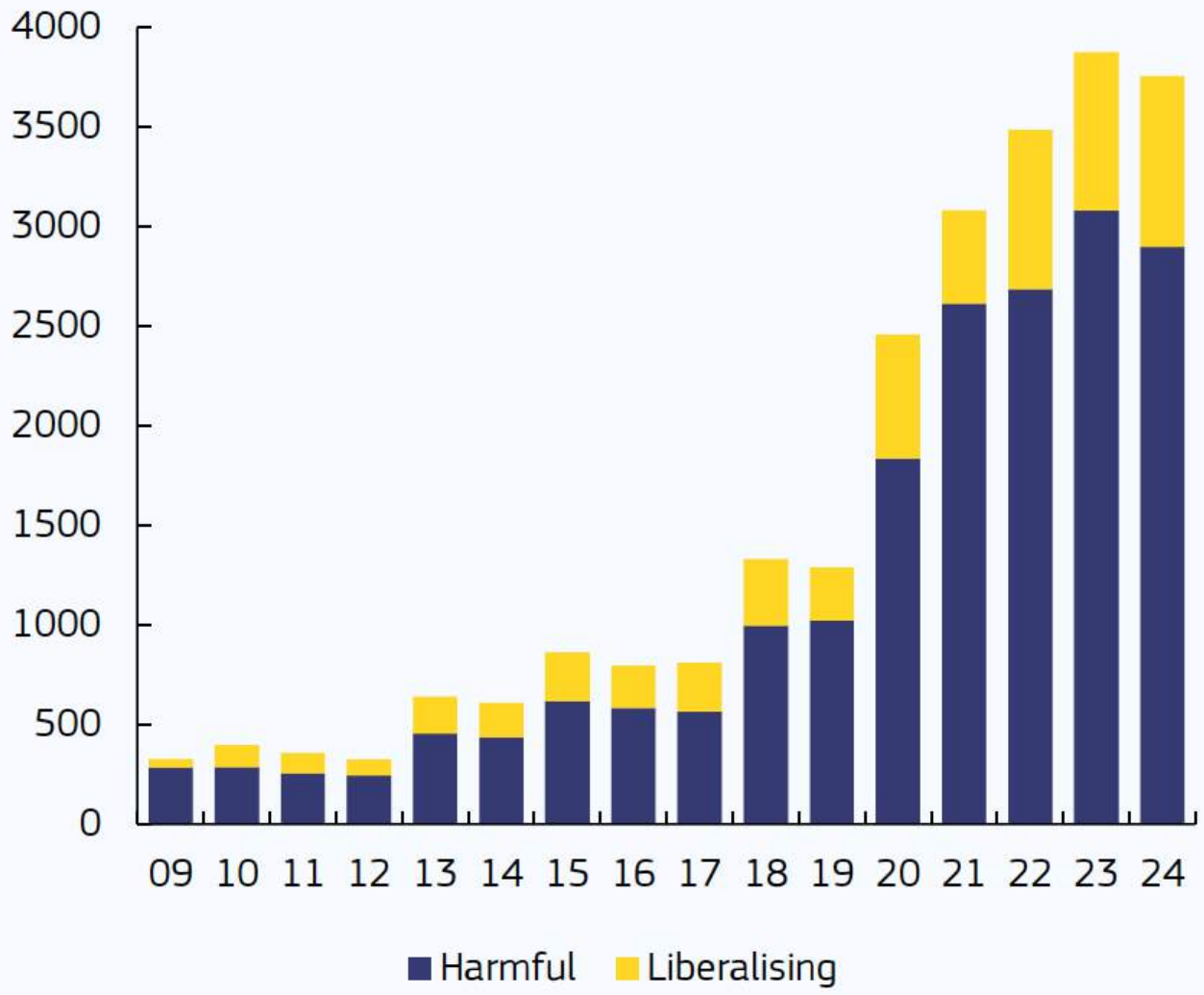
Le paure della FED sugli effetti della Trumponomics

OMS & CO2: una guerra contro i simboli istituzionali e ambientali della globalizzazione

World Health Organization

C’era una volta il «libero commercio»…

Graph 1: **New trade policy interventions**



Source: https://www.globaltradealert.org/

Il protezionismo cresce: oltre 10.000 interventi restrittivi sul commercio internazionale solo negli ultimi 4 anni

Il Dazio Atlantico: impatti del protezionismo USA

Trump: imporremo all'Ue dazi al 25%, «formata per fregare gli Usa». Bruxelles: «Reagiremo subito e con fermezza»

26 febbraio 2025

▲ Donald Trump mostra cappello con uno slogan autocelebrativo, dopo aver firmato un ordine e

IL PRESIDENTE ORSINI

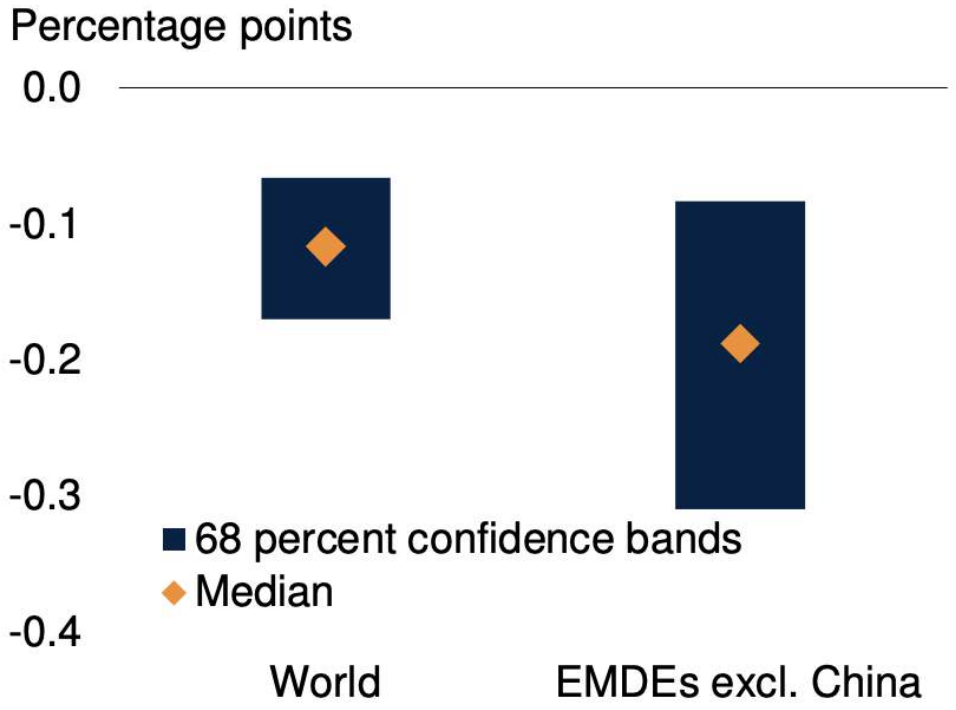
Dazi, Confindustria: "È un'ora buia, dagli Usa attacco all'Ue"

26 Feb 2025 - 22:01

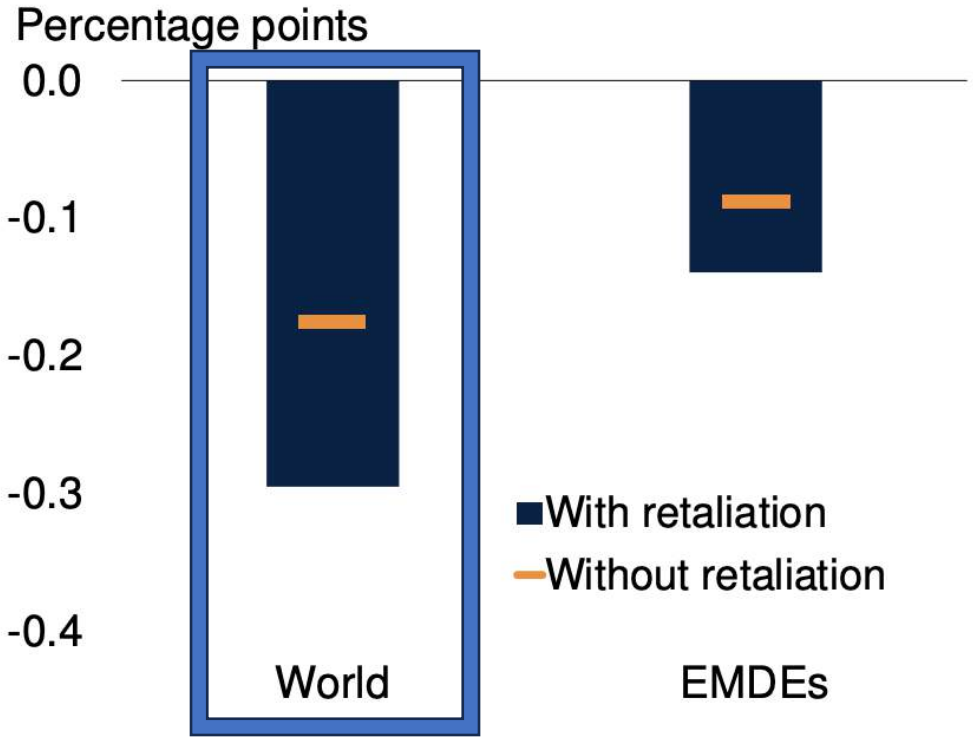
COMMENTA aA

Gli impatti negativi dell'incertezza e dei dazi americano sul PIL mondiale

A. Cumulative impact of a 10 percent rise in global economic policy uncertainty on output growth

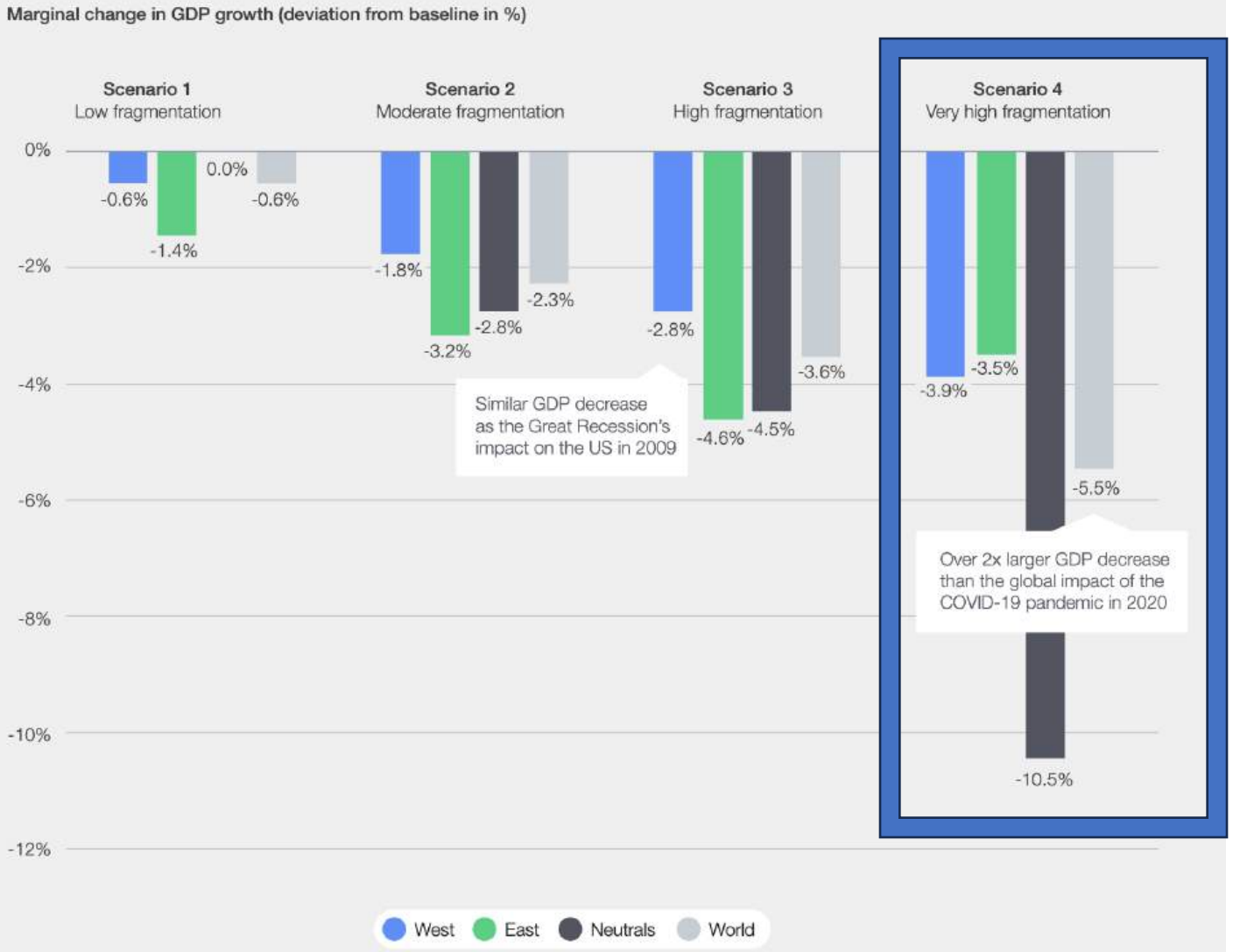


B. Impact of a 10-percentage-point increase in U.S. tariffs on global and EMDE growth



Source: World Bank - Global Economic Prospects, January 2025

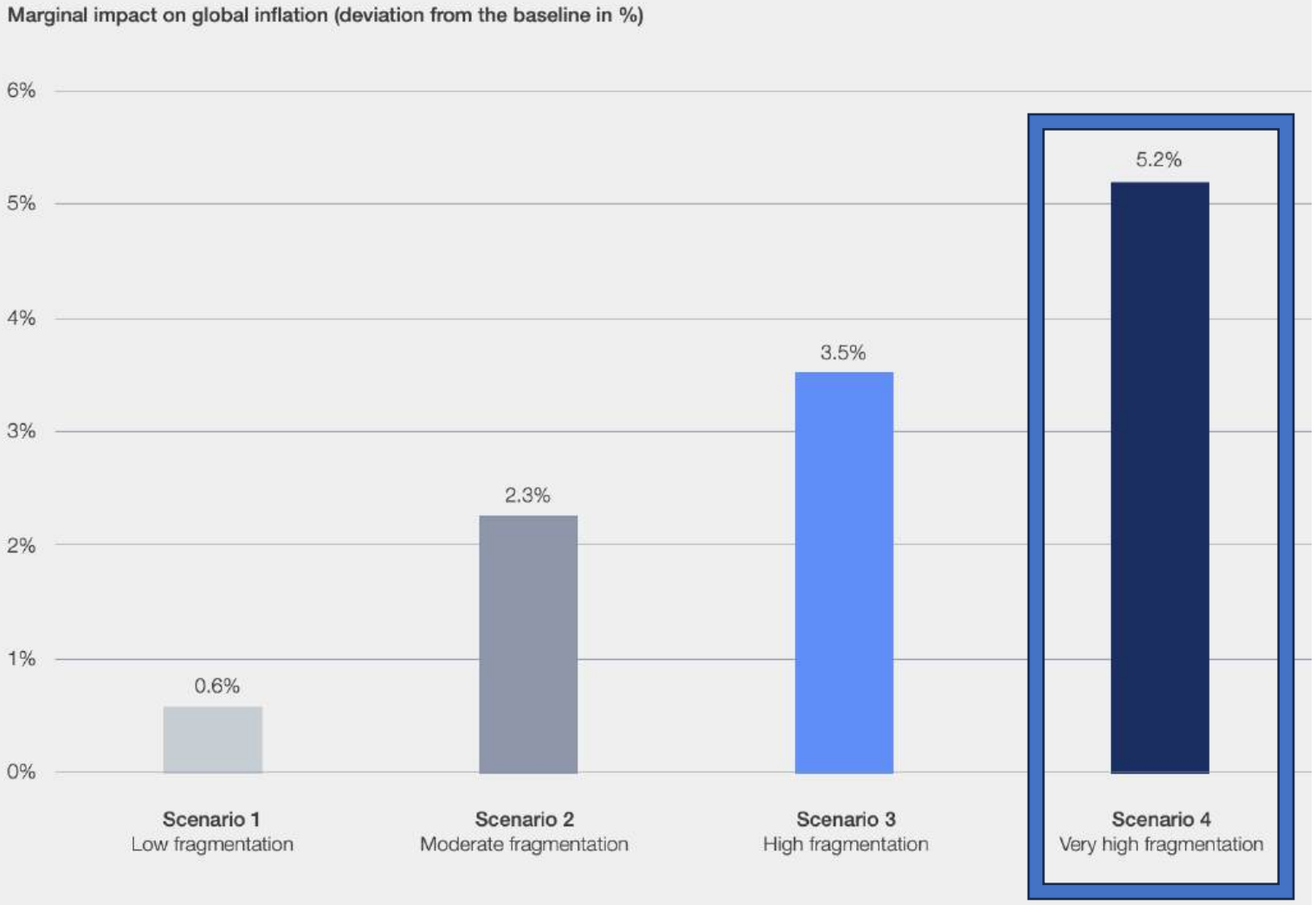
FIGURE 7 **Short-run impact of financial fragmentation on gross domestic product across geopolitical blocs**



Source: NERA analysis based on the multi-country, multisector model of Baqaee & Farhi (2024).[32] Data from 2013 World Input–Output Database and Asian Development Bank's 2023 Input–Output Tables. Short-run impact is defined as the impact measured one year after the shocks and is based on applying the one-year to 10-year trade elasticity ratio found in Boehm et al. (2023)[33] to the elasticities in Baqaee & Farhi (2024), as in Bolhuis et al. (2023)[34]

In uno scenario di guerra commerciale l'impatto sul PIL globale potrebbe essere molto superiore a quello del COVID-19

FIGURE 8 **Short-run impact of geoeconomic fragmentation on global inflation**

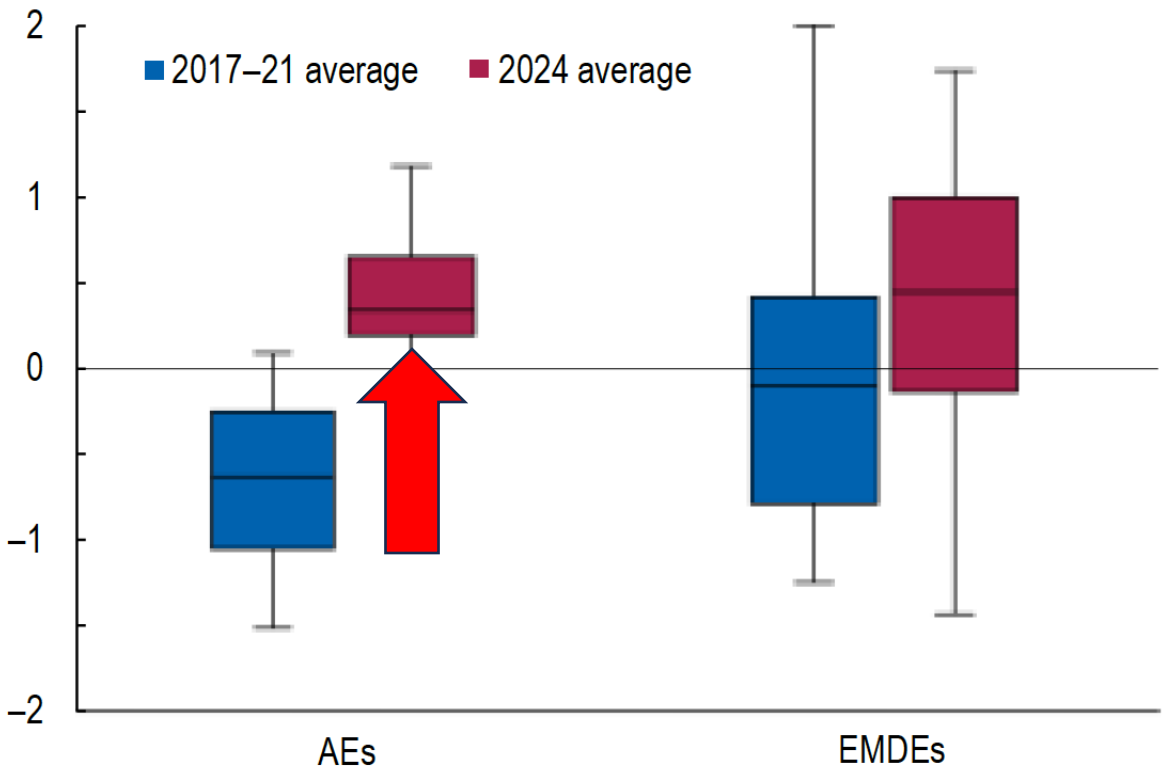


Source: NERA analysis based on multi-country, multisector model of Baqaee & Farhi (2024).[36] Data from 2013 World Input–Output Database and Asian Development Bank's 2023 Input–Output Tables. Short-run impact is defined as the impact measured one year after the shocks and is based on applying the 1-year to 10-year trade elasticity ratio found in Boehm et al. (2023)[37] to the elasticities in Baqaee & Farhi (2024), as in Bolhuis et al. (2023)[38]

Un'elevata frammentazione del commercio internazionale può avere un impatto di oltre il 5% sull'inflazione globale

Figure 3. Cross-Country Inflation Expectations

(Percentage point deviation from target, next 12 months)



Sources: Central bank websites; Consensus Economics; Haver Analytics; and IMF staff calculations.
Note: The horizontal lines in the middle of the boxes are the medians, and the upper (lower) limits of the boxes are the third (first) quartiles. The whiskers show the maximum and minimum within a boundary of 1.5 times the interquartile range from the upper and lower quartiles, respectively. AEs = advanced economies; EMDEs = emerging market and developing economies.

The magnitude of the inflationary effect from tariffs is especially uncertain. While recent empirical studies find high pass-through to import prices, estimates of pass-through to consumer prices are lower and subject to significant uncertainty. Nevertheless, compared with what took place in earlier episodes of trade disputes, several factors suggest that upside risks to inflation from tariff hikes could be higher this time.

First, the global economy is coming out of the most significant inflation surge in recent memory. Inflation expectations, especially in many advanced economies, are farther above the central bank target today than in 2017–21 (Figure 3).

Second, the cyclical positions of many major economies are more conducive to higher inflation today than in 2016.

Third, retaliation in the form of restrictions on specific, difficult-to-substitute materials or intermediate goods may have an outsized impact on aggregate inflation.

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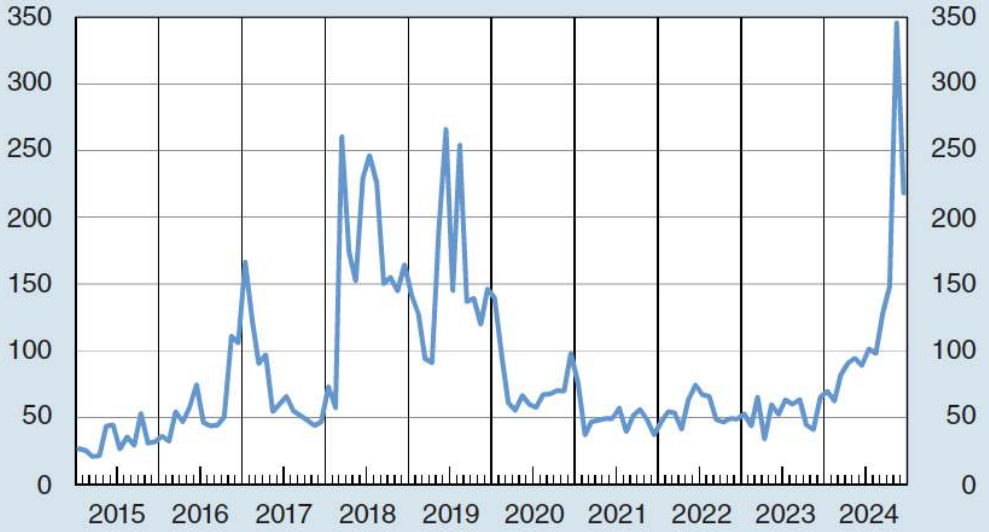
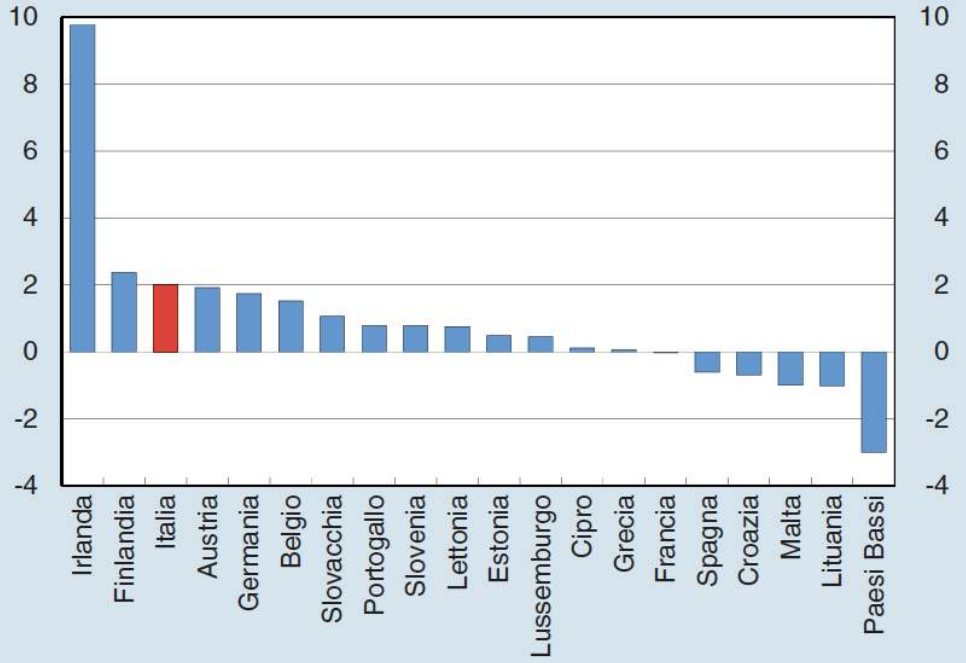
Massima incertezza sulle politiche commerciali, Italia in prima linea per il rischio dazi

Incertezza sulle politiche commerciali e saldo bilaterale del commercio di beni con gli Stati Uniti

(a) indicatore di incertezza sulle politiche commerciali
(numero indice: gennaio 2021=100)



(b) saldi bilaterali del commercio di beni con gli Stati Uniti
(in percentuale del PIL)

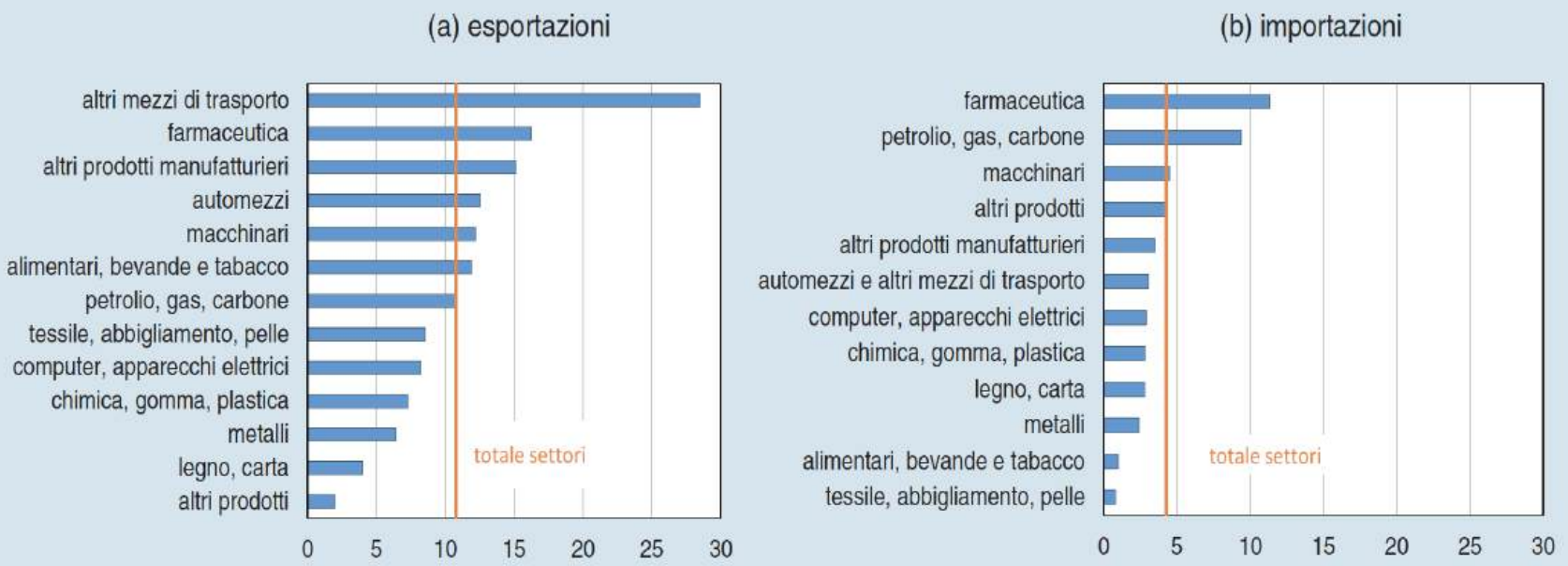


Fonte: *trade policy uncertainty index* ed elaborazioni su dati Eurostat di bilancia dei pagamenti relativi al 2023.

Fonte: Banca d'Italia, Bollettino Economico 1/2025

Le PMI italiane sono le più esposte ai dazi USA: 27% delle loro esportazioni è a rischio dazi

Incidenza del mercato statunitense sulle esportazioni e importazioni dell'Italia per settore
(punti percentuali)



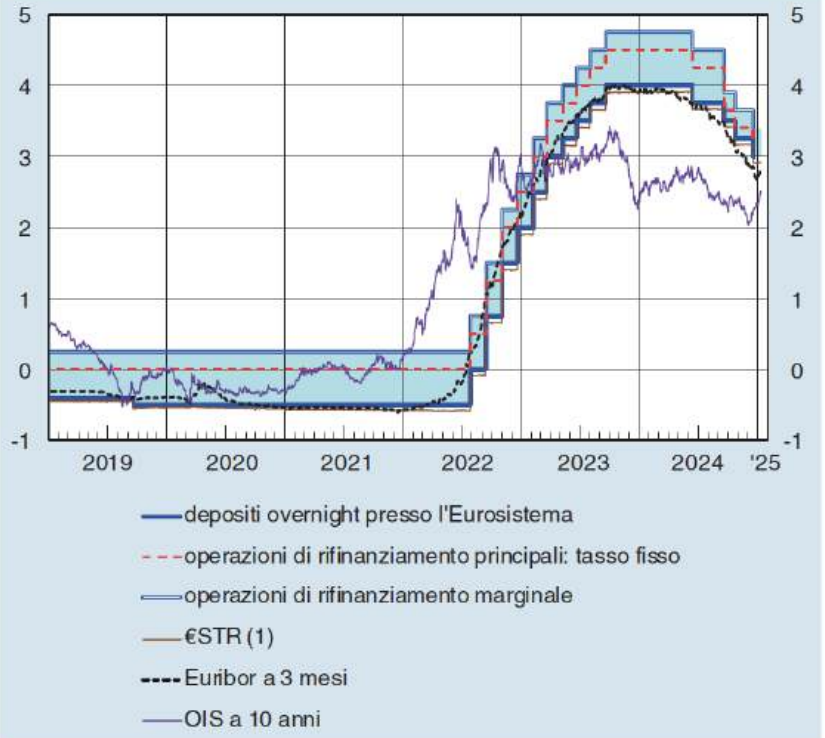
Fonte: Istat, dati di commercio estero relativi al 2023. La linea verticale arancione indica la quota percentuale aggregata del mercato statunitense sul totale delle esportazioni e importazioni italiane.

Gli Stati Uniti costituiscono un mercato di destinazione per quasi un terzo delle aziende esportatrici italiane4. Poco più della metà delle vendite verso questo paese è realizzata da grandi imprese (con almeno 250 addetti), con un'esposizione media pari al 5 per cento del fatturato e al 15 per cento delle proprie esportazioni. Per le imprese piccole e medie il mercato americano risulta relativamente più rilevante (in media, circa il 7 per cento del fatturato e il 27 per cento delle esportazioni). A questa classe dimensionale appartiene inoltre la quasi totalità degli esportatori caratterizzati da un'esposizione particolarmente elevata verso gli Stati Uniti.

In conclusione, un inasprimento dei dazi avrebbe effetti significativi sulle aziende italiane che esportano verso il mercato statunitense, soprattutto le piccole e le medie. In aggiunta agli effetti diretti, le restrizioni commerciali potrebbero colpire anche i produttori che, pur non esportando direttamente, forniscono input intermedi incorporati nei beni destinati agli Stati Uniti6. Peraltro, l'elevata incertezza sulle politiche commerciali può costituire di per sé un freno consistente agli investimenti.

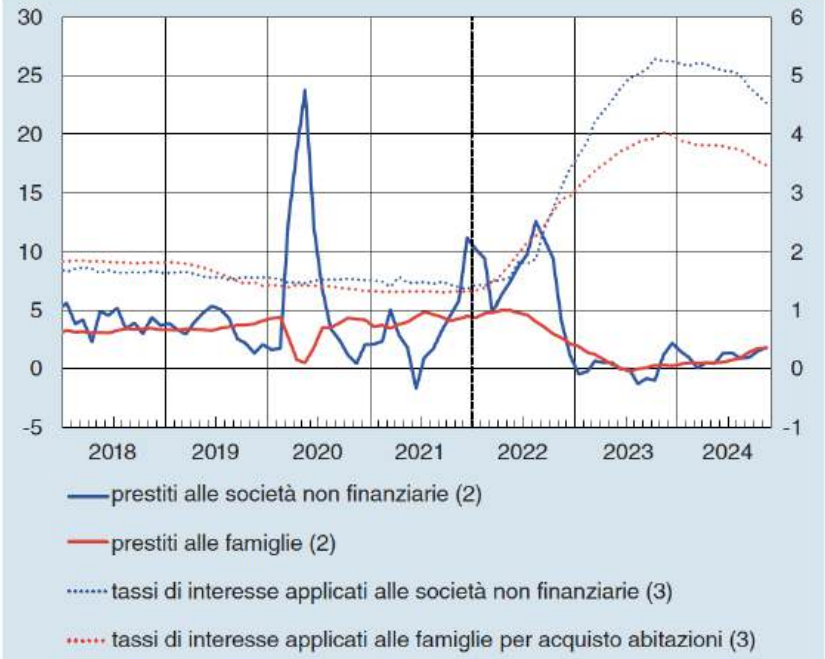
Fonte: Banca d'Italia, Bollettino Economico 1/2025

Tassi di interesse ufficiali e del mercato monetario nell'area dell'euro
(dati giornalieri; valori percentuali)



Fonte: BCE e LSEG.
(1) Dal 1° ottobre 2019 l'Euro short-term rate (€STR) è il tasso di riferimento overnight per il mercato monetario dell'area dell'euro; per il periodo precedente viene riportato il tasso pre-€STR.

Prestiti e tassi di interesse nell'area dell'euro (1)
(dati mensili)

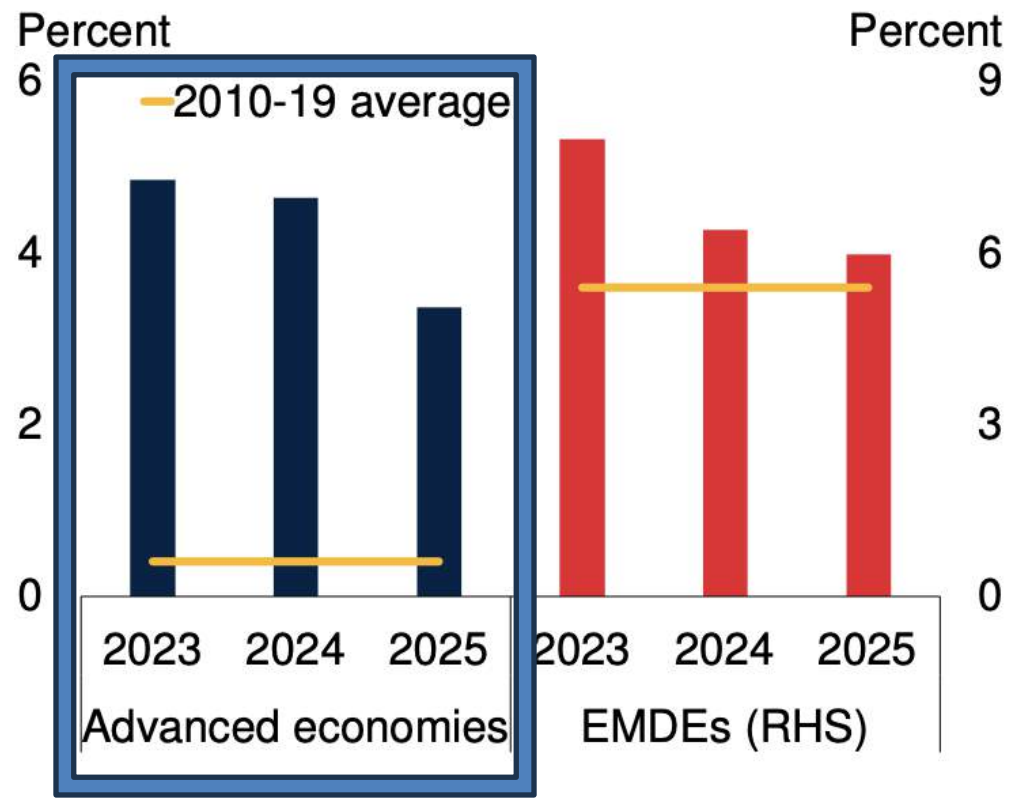


Fonte: BCE.
(1) La linea verticale in corrispondenza del dicembre 2021 indica l'inizio del processo di normalizzazione della politica monetaria della BCE. – (2) Variazioni percentuali sui 3 mesi in ragione d'anno. I prestiti includono le sofferenze e i pronti contro termine, nonché la componente di quelli non rilevati nei bilanci bancari in quanto cartolarizzati. Le variazioni percentuali sono calcolate al netto di riclassificazioni, variazioni del cambio, aggiustamenti di valore e altre variazioni non derivanti da transazioni. I dati sono depurati dalla componente stagionale. – (3) Valori percentuali. Media ponderata dei tassi di interesse sui nuovi prestiti a breve, a medio e a lungo termine, con pesi pari alla media mobile a 24 mesi dei flussi di nuove erogazioni; per le società non finanziarie sono inclusi i finanziamenti in conto corrente. Scala di destra.

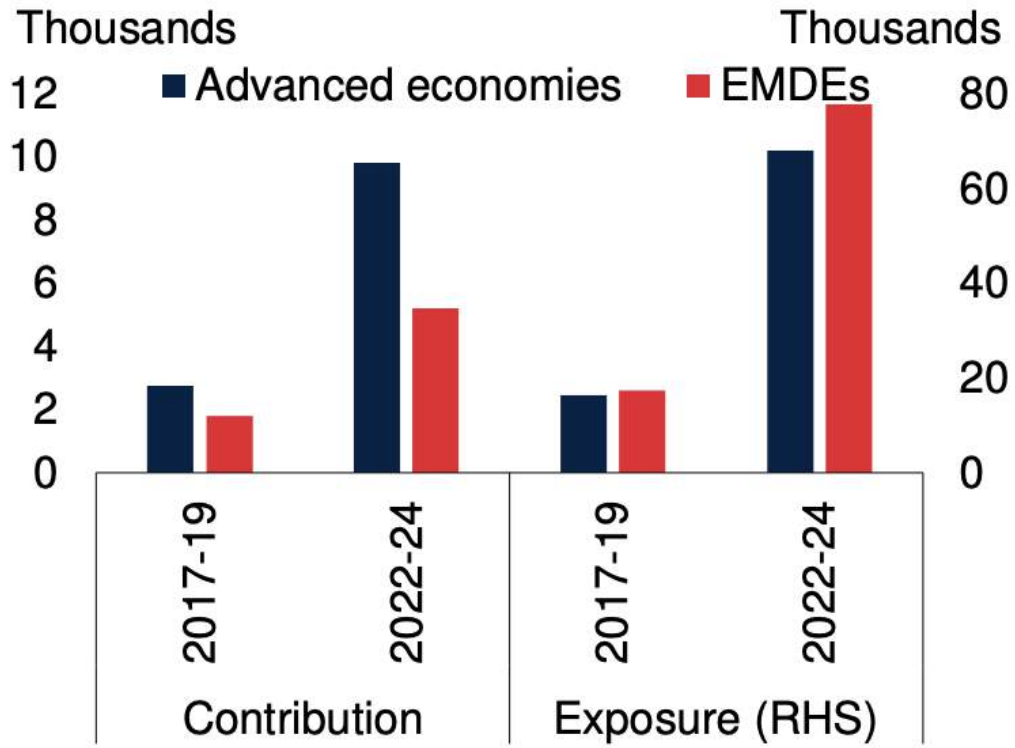
Sta passando l'onda nera dei tassi?

Fonte: Banca d'Italia, Bollettino Economico 1/2025

E. Policy rates in advanced economies and EMDEs



F. New trade-distorting policy measures

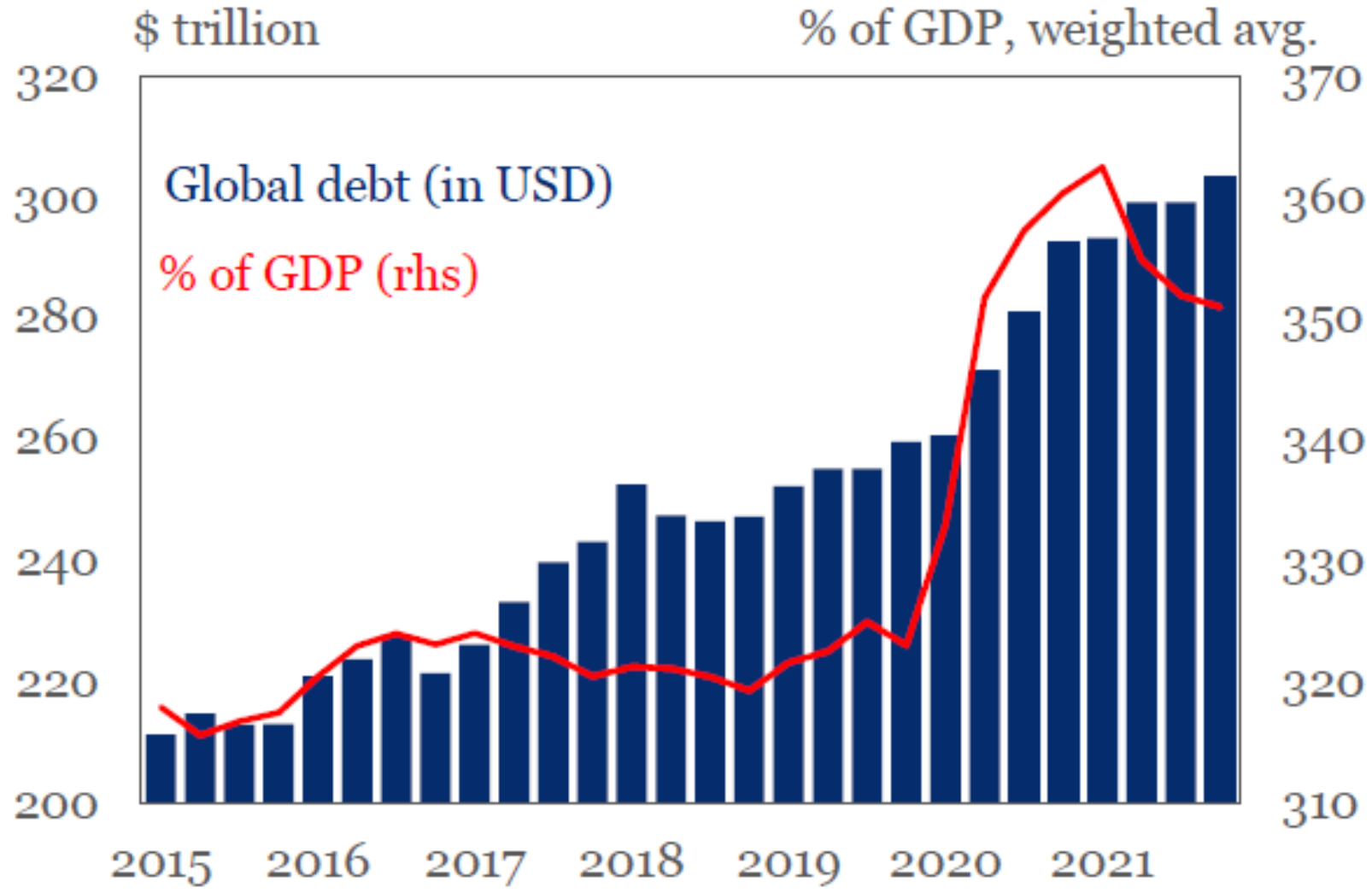


Sources: Bloomberg; Consensus Economics; Global Trade Alert (database); Haver Analytics; International Energy Agency (IEA); World Bank.

Note: AEs = advanced economies; avg. = average; e = estimate; EMDEs = emerging market and developing economies; f = forecast; RHS = right-hand scale. Unless otherwise indicated, aggregates are calculated using real U.S. dollar GDP weights at average 2010-19 prices and market exchange rates.

Source: World Bank - Global Economic Prospects, January 2025

300.000.000.000.000 (trecentomilamiliardi) di dollari di debito totale



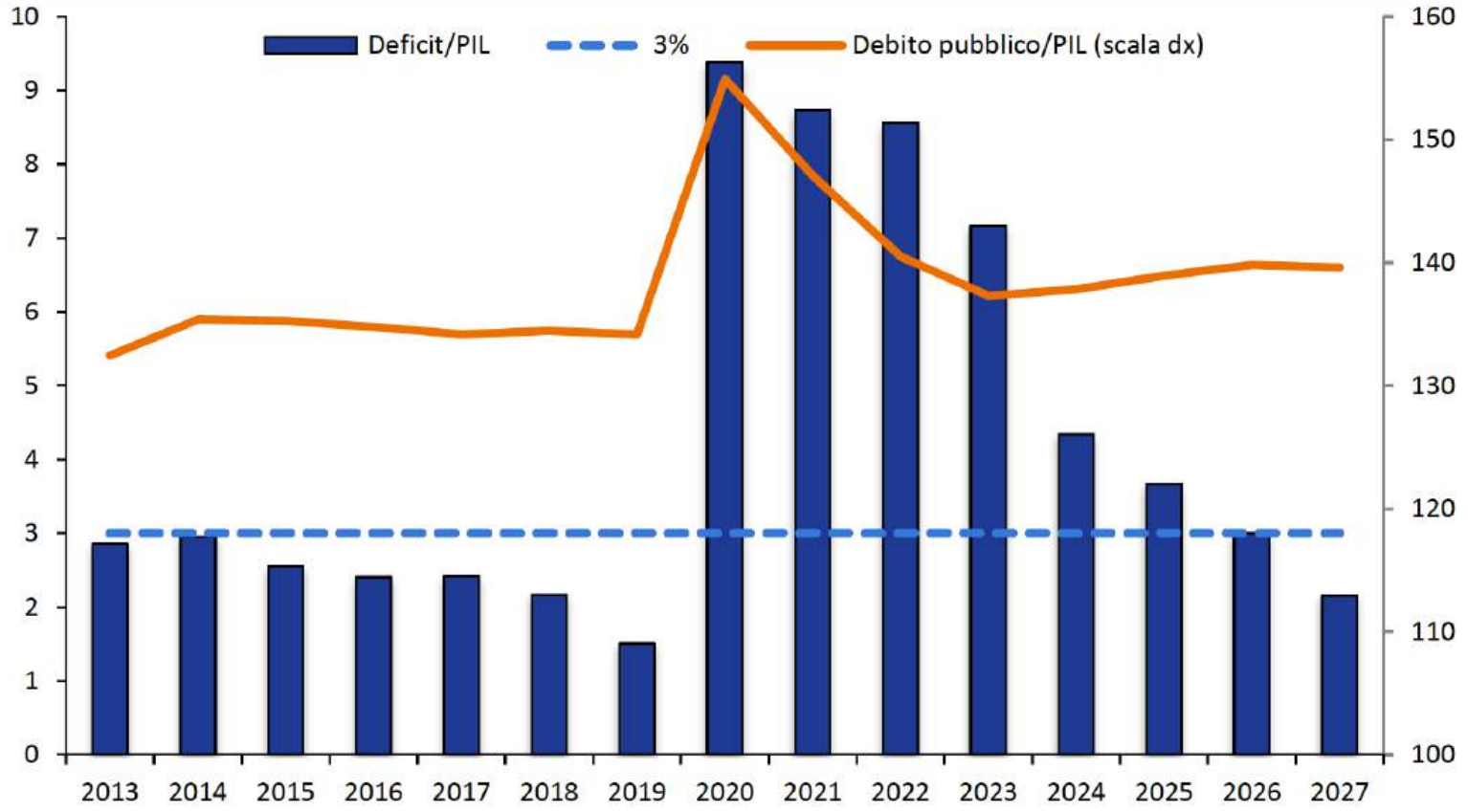
Source: IIF, BIS, IMF, National sources, Haver

L'impennata del debito pubblico e privato globale, arrivato a oltre 350% del PIL mondiale in media ponderata.

Lo Stato non è più il «garante di ultima istanza»

500 miliardi di extra deficit in 4 anni per le politiche populiste sui bonus

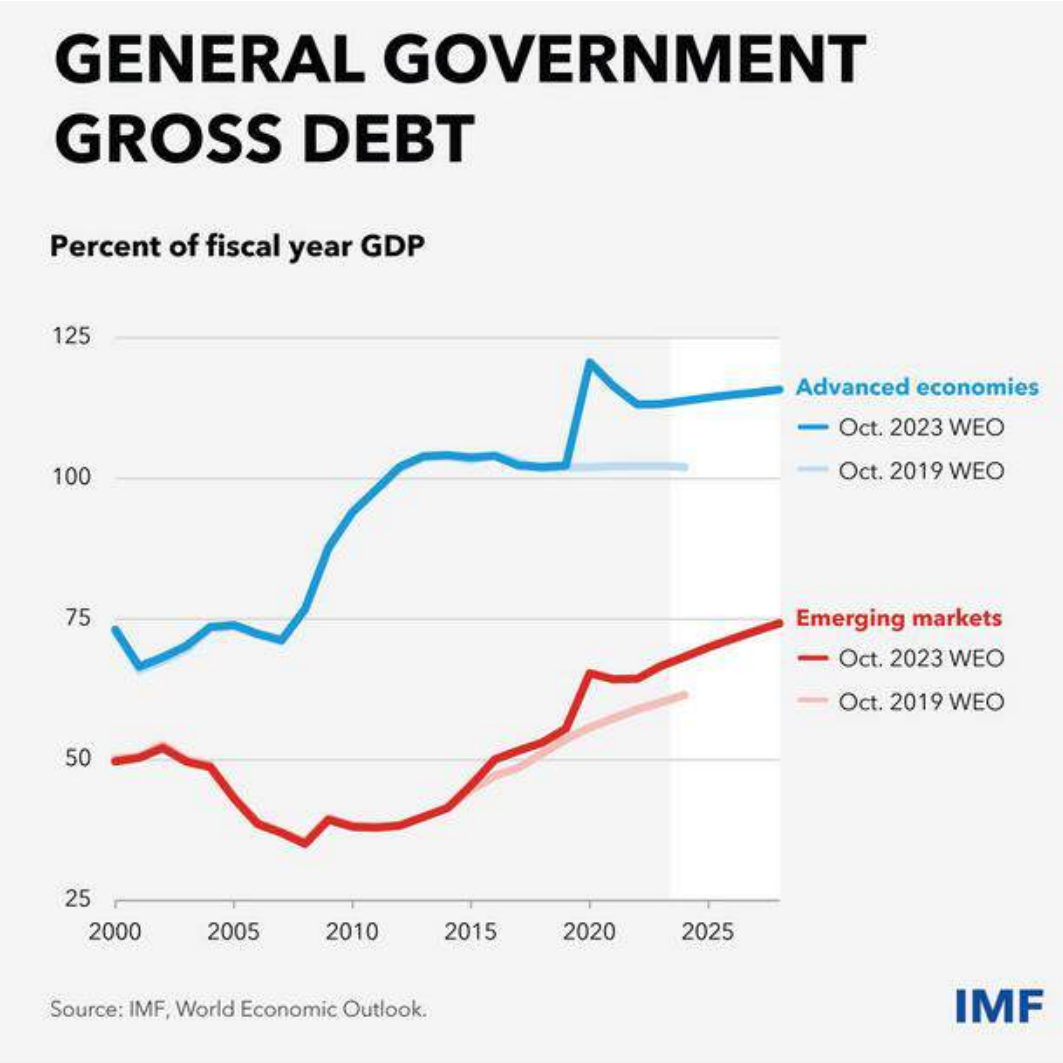
FIGURA I.2: INDEBITAMENTO NETTO E DEBITO LORDO DELLA PA IN RAPPORTO AL PIL

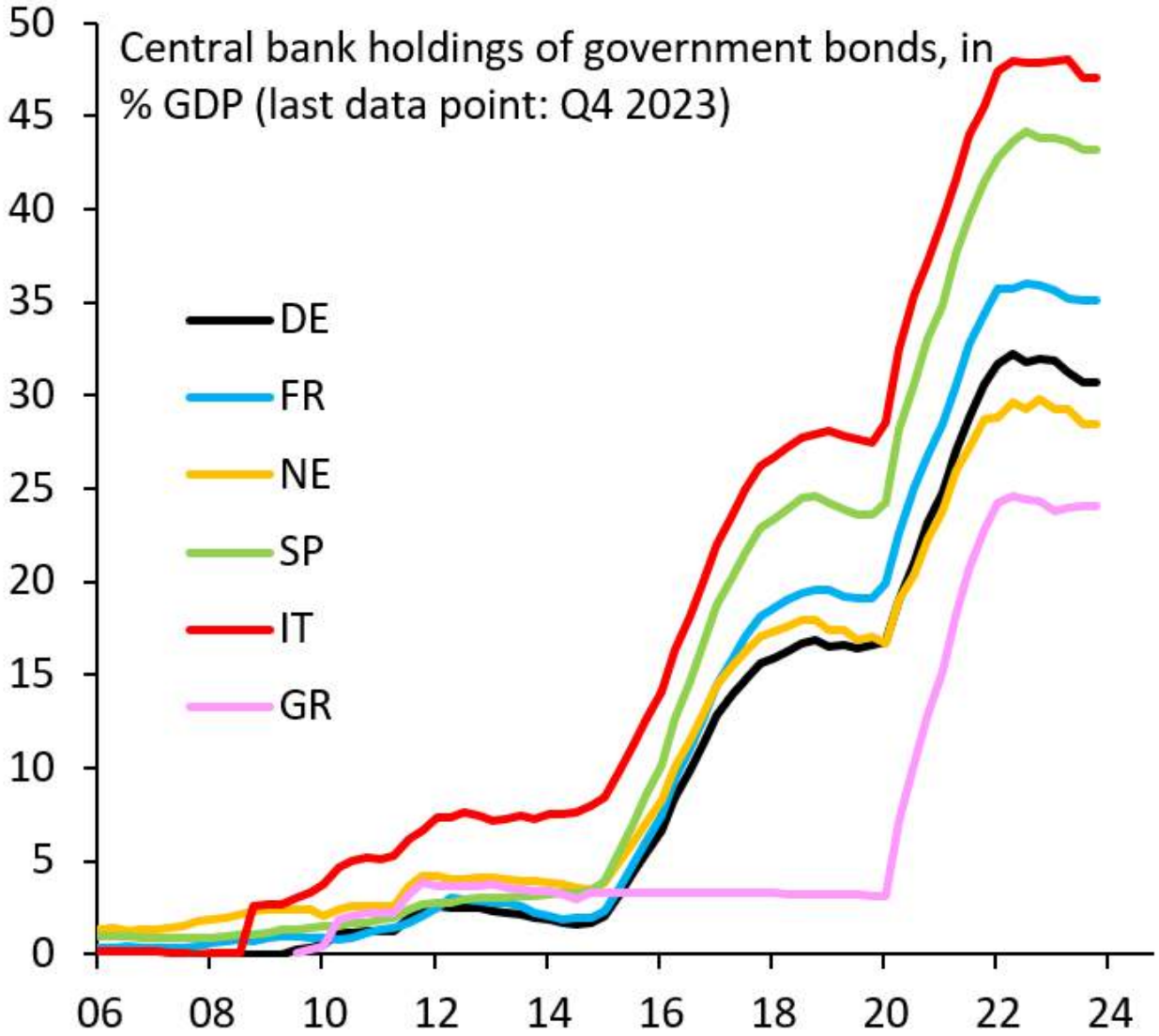


Fonte: Istat e Banca d'Italia. Dal 2024, previsioni dello scenario tendenziale.

La Repubblica Italiana è un gestore del risparmio e una compagnia di assicurazione poco affidabile e sempre sull'orlo della crisi finanziaria, e promette a tutti generosi rendimenti intergenerazionali che non potrà onorare.

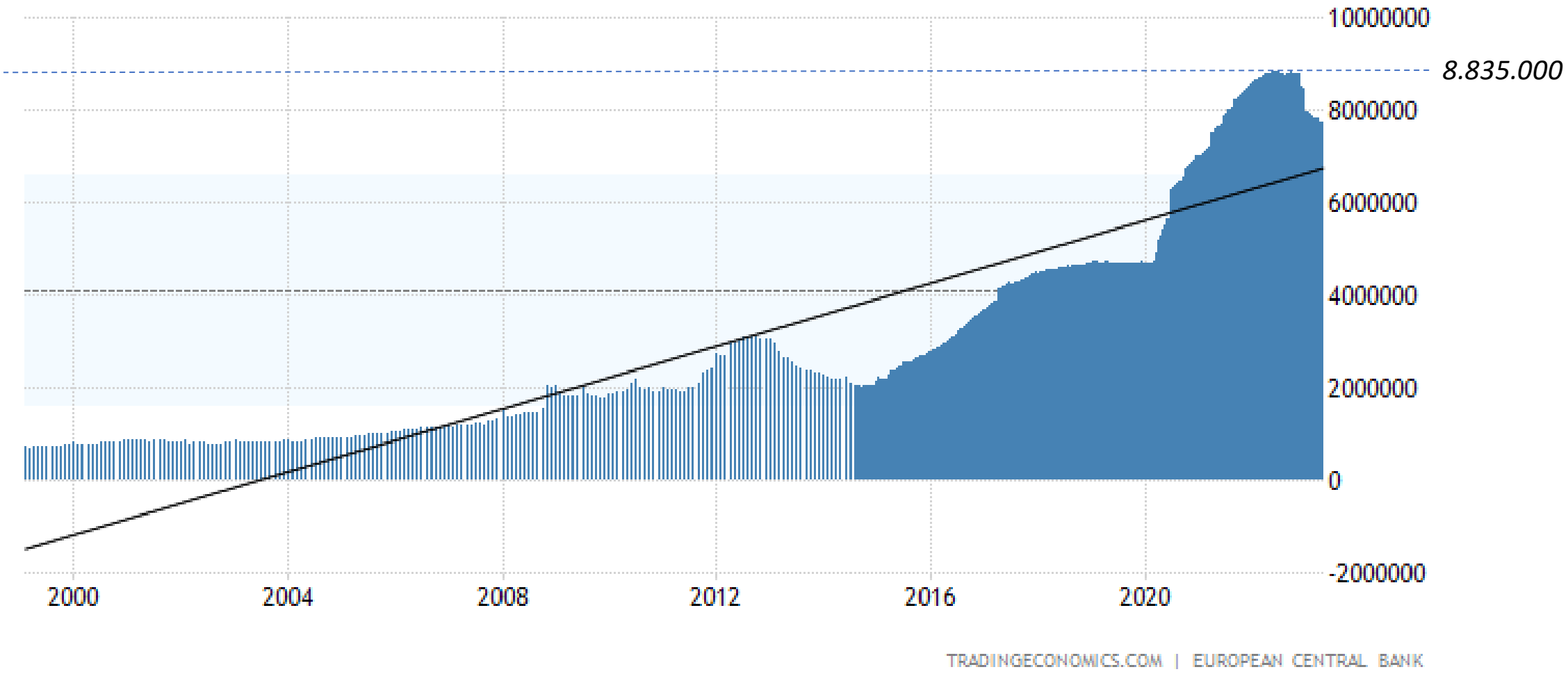
L’esplosione del debito pubblico è stata assorbita dalle banche centrali





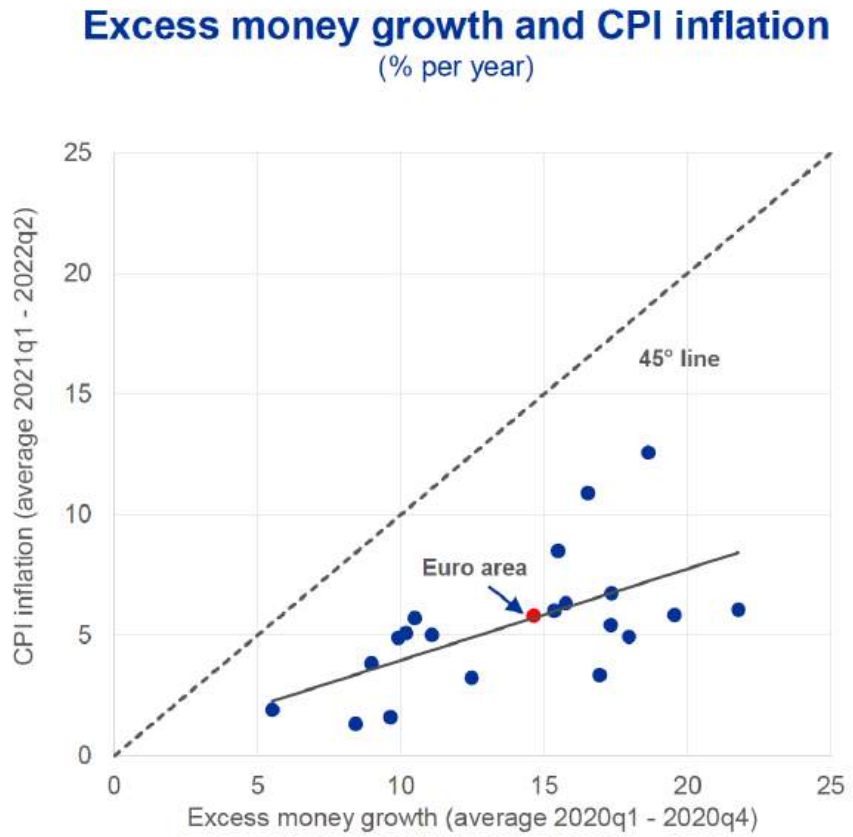
L’inflazione ha sempre un padre e una madre

La BCE ha espanso il bilancio fino a 8.835 miliardi, pari all'83% del PIL dell'Eurozona (la FED il 37%)



La crescita del debito post pandemia è correlata positivamente con l'eccesso di base monetaria

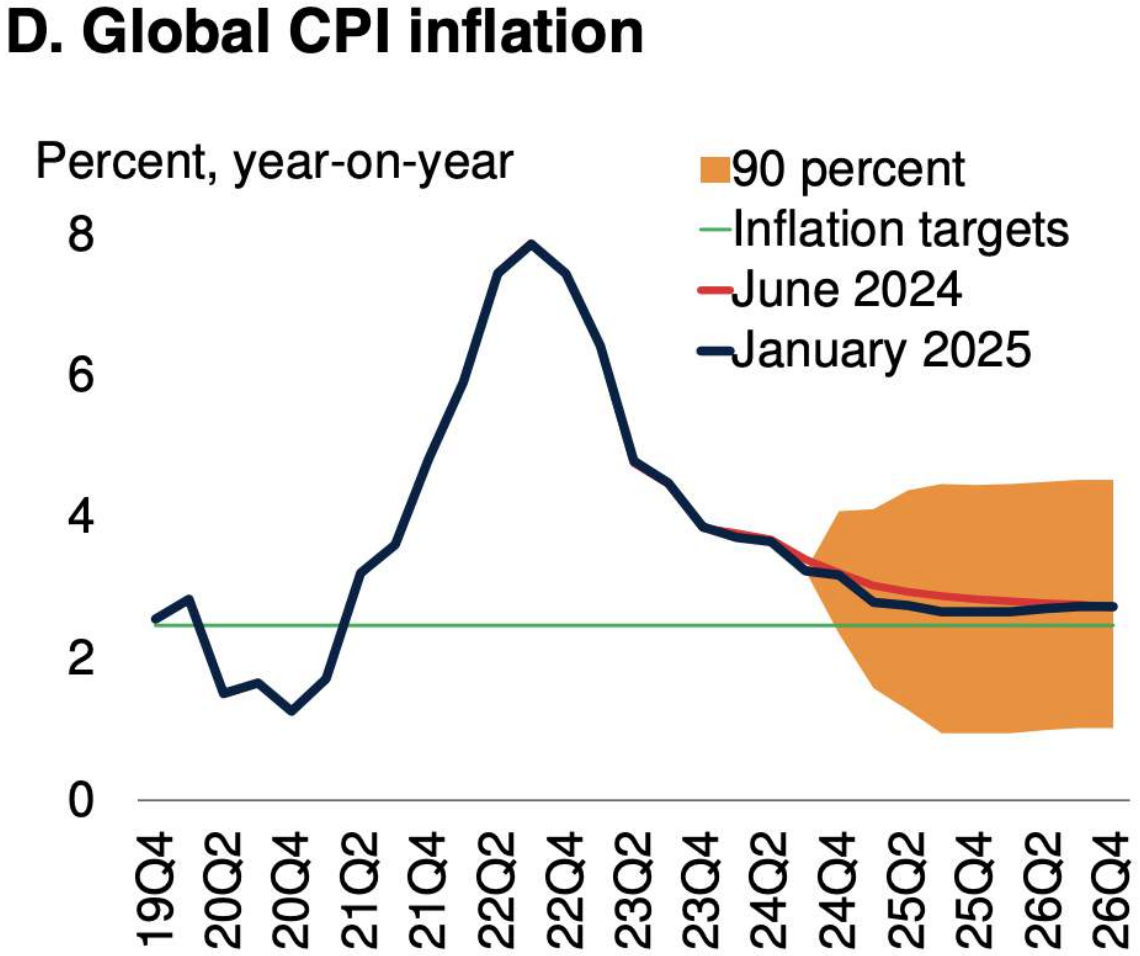
Post-pandemic inflation surge was positively correlated with excess money growth



Source: ECB.
Notes: The chart plots excess money growth in 2020 against average CPI inflation between 2021 Q1 and 2022 Q2. Red dot denotes euro area. Countries included are Australia, Canada, Chile, China, Denmark, Euro area, Hungary, India, Indonesia, Israel, Japan, Korea, Mexico, New Zealand, Norway, Poland, South Africa, Sweden, Switzerland, U.K. and U.S.

Perché l’inflazione non tornerà facilmente ai livelli precedenti alla crisi e rischia di rimanere elevata

1. **Debito enorme**: 300.000 miliardi di dollari di debito pubblico e privato globale, il 350% del Pil mondiale.
2. **Catene di approvvigionamento** più frammentate, con investimenti duplicati e risorse eccessive/scarse per garantire maggiore resilienza.
3. **Demografia:** mercato del lavoro e fattori finanziari in Cina e in Occidente.
4. **Transizione energetica**, con investimenti in conto capitale più elevati a livello globale e crescita inferiore nelle regioni dipendenti dall’energia.



ReArm Europe:
Il libro è ancora bianco…

European Parliament
2024-2029

TEXTS ADOPTED

P10_TA(2025)0034

White paper on the future of European defence

European Parliament resolution of 12 March 2025 on the white paper on the future of European de

White Paper on Defense: Joint EU procurement and industrial integration with Ukraine

The follow-up document to the 'Rearm Europe' plan is taking shape. The Commission tries to take the role of a steering cabin, as it did with COVID-19. It includes new direct support to Kyiv.

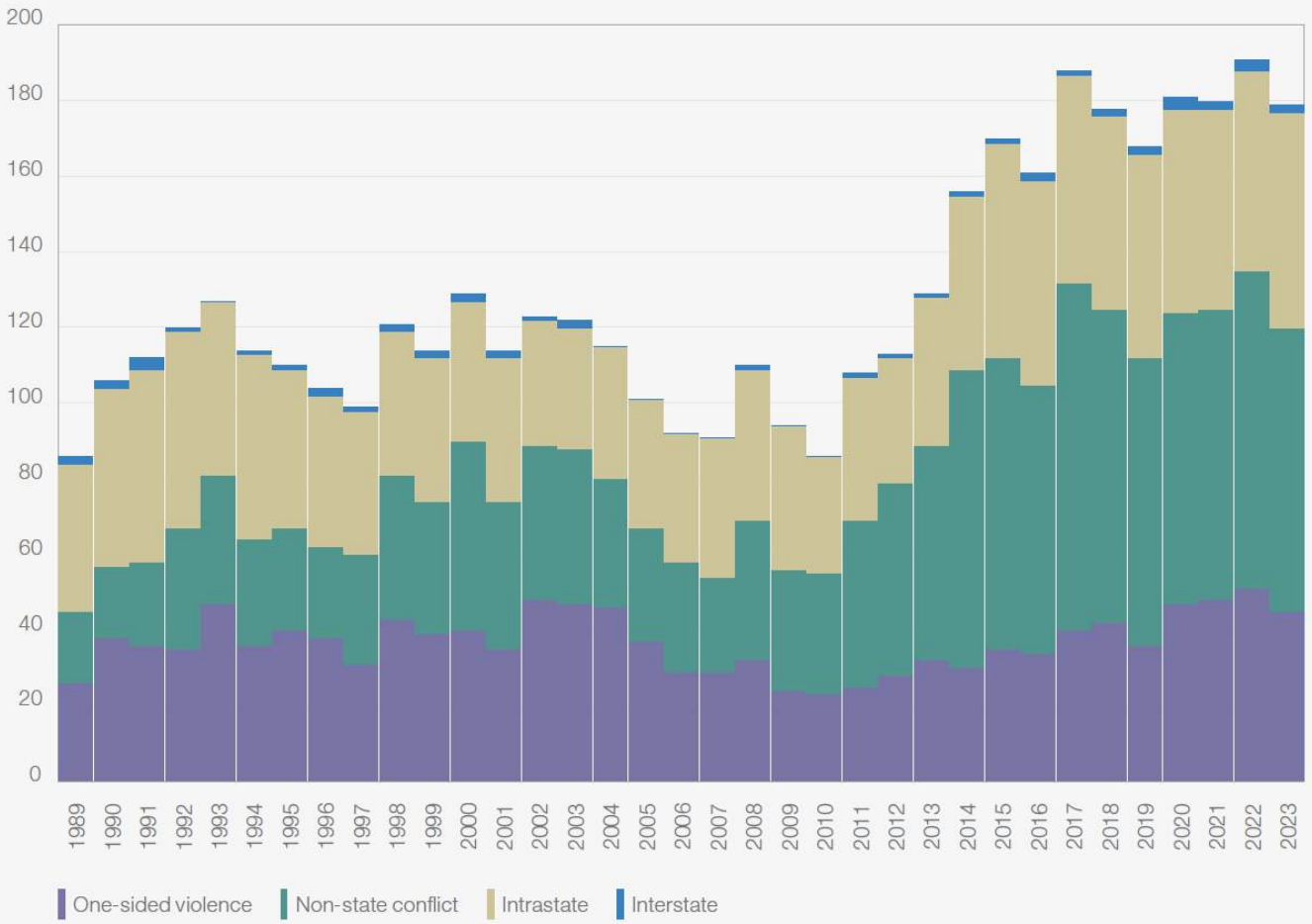
by Emanuele Bonini emanuelebonini — 14 March 2025 in Politics, In the spotlight

Defence

EU Commission White Paper sets out steps for 'single market for defence'

The Commission also listed seven areas in which there are "several different critical capability projects" and where EU countries needed to prioritise spending.

FIGURE 1.12 | Number of armed conflicts since the end of the Cold War (1989-2023)



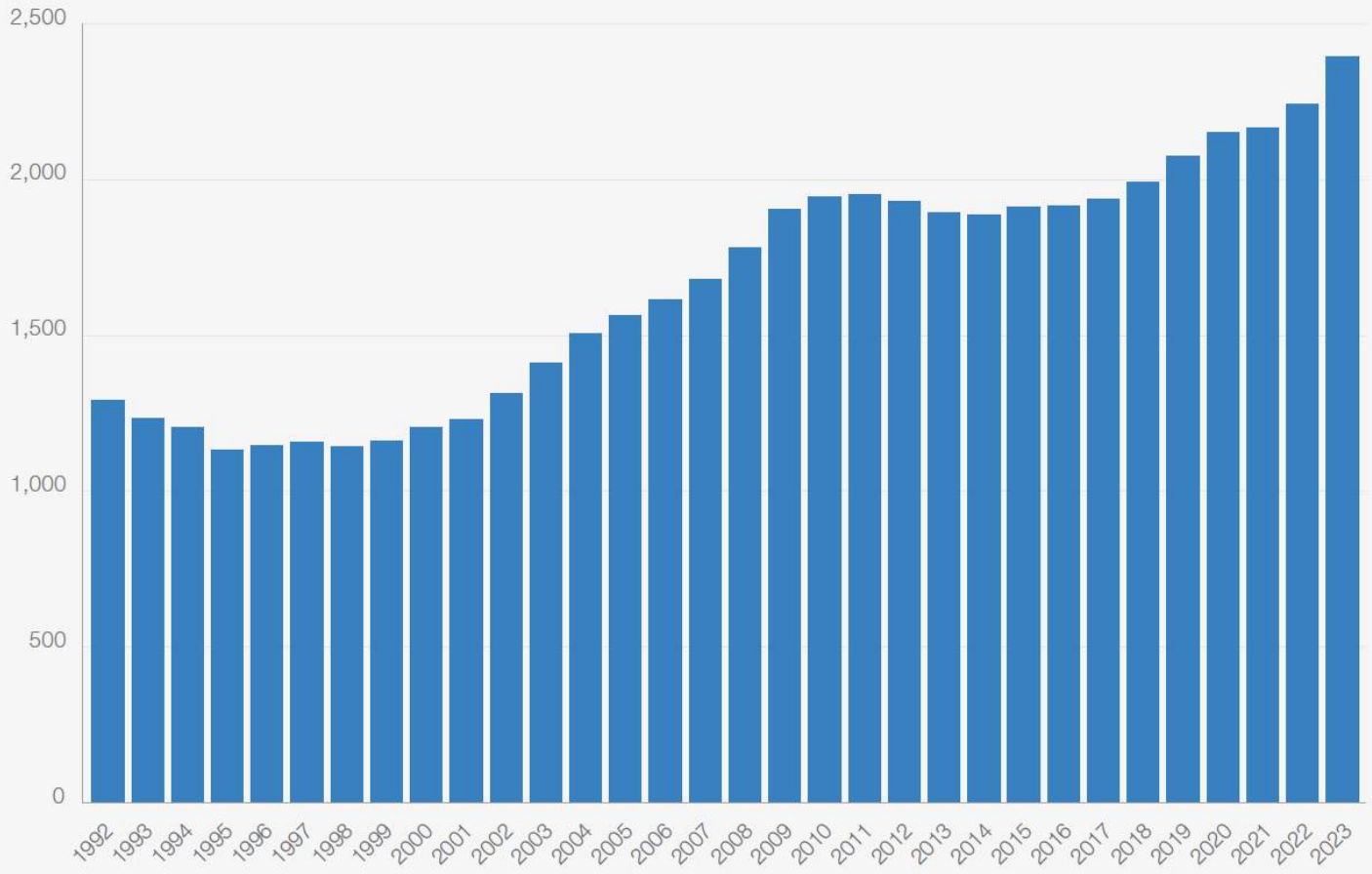
Source

The Uppsala Conflict Data Program (UCDP).

Conflitti armati: +60% in 10 anni.

Since 2014, the number of armed conflicts has been elevated compared to the period from the 1990s to the early 2010s. Interstate conflicts, while they tend to present the greatest threats to global stability, only constitute a small proportion of the total number of armed conflicts, which also include one-sided, nonstate and intrastate armed conflicts.

FIGURE 1.13 | World military expenditure (billion $), 1992-2023



Source

Stockholm International Peace Research Institute, Military Expenditure Database.

Note

Values are in billion $ at constant 2022 prices and exchange rates.

2023: record storico di spese militari: 2.400 miliardi di US$

World military expenditure increased for the ninth consecutive year in 2023, reaching a total of $2.4 trillion,11 with 2023 seeing a steep rise over 2022 (see Figure 1.13). The top five countries accounted for 61% of the total. As governments with strengthening militaries perceive that multilateral constraints on unilateral military action are weaker, there could be more instances of cross-border military interventions in the coming years.

Figure 5. Share of Total Defence Expenditure Allocated to Defence Investment

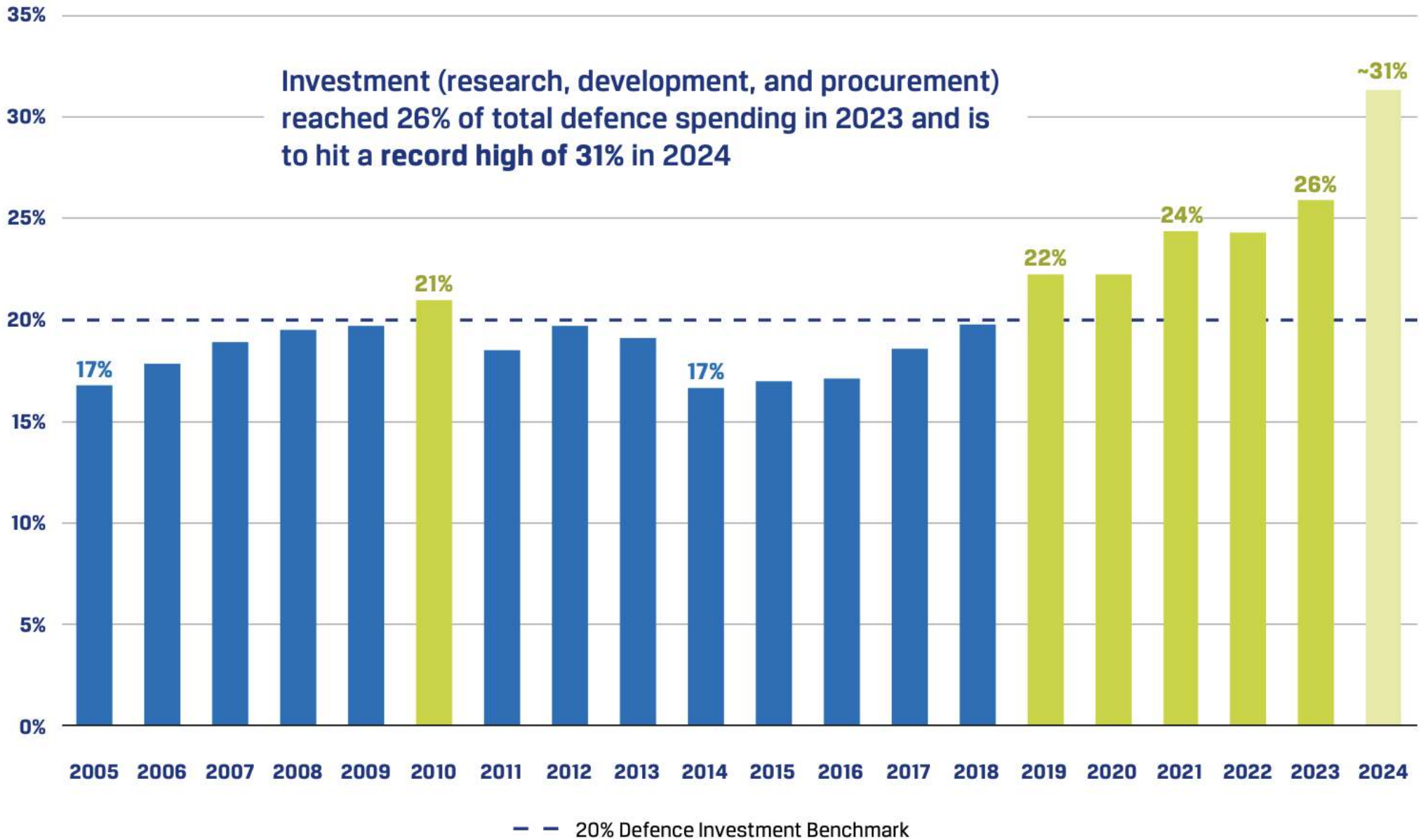
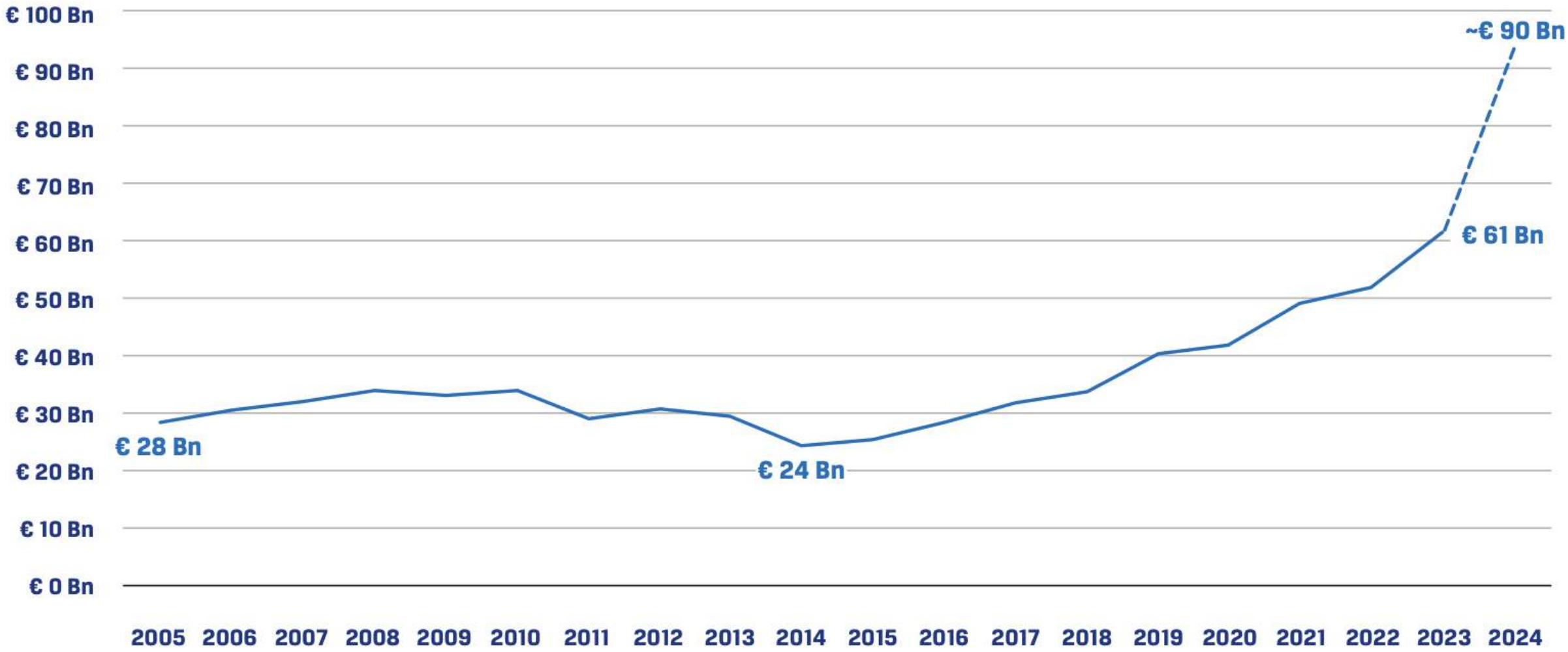


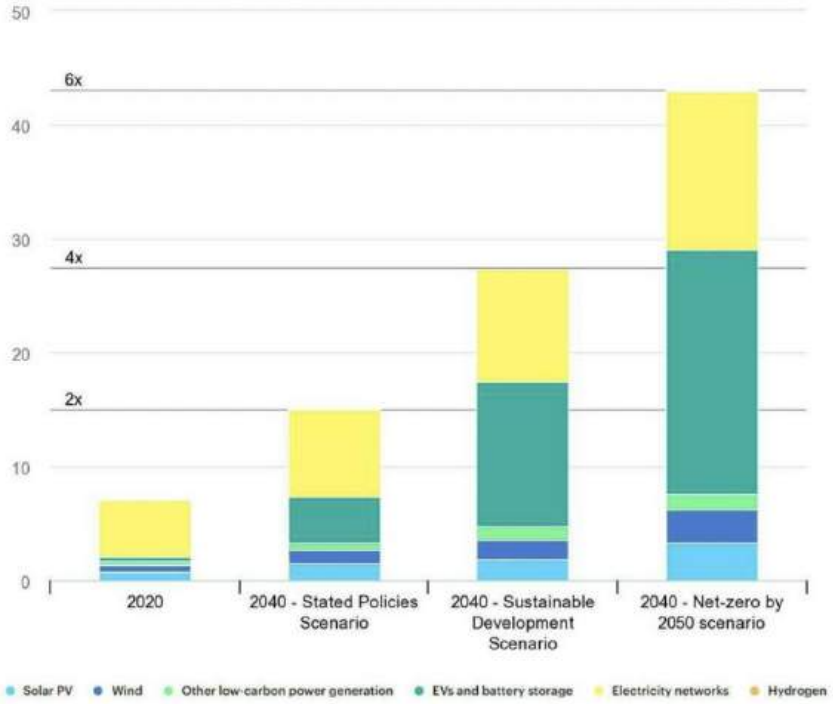
Figure 6. Defence Equipment Procurement

Figures are in constant 2023 prices



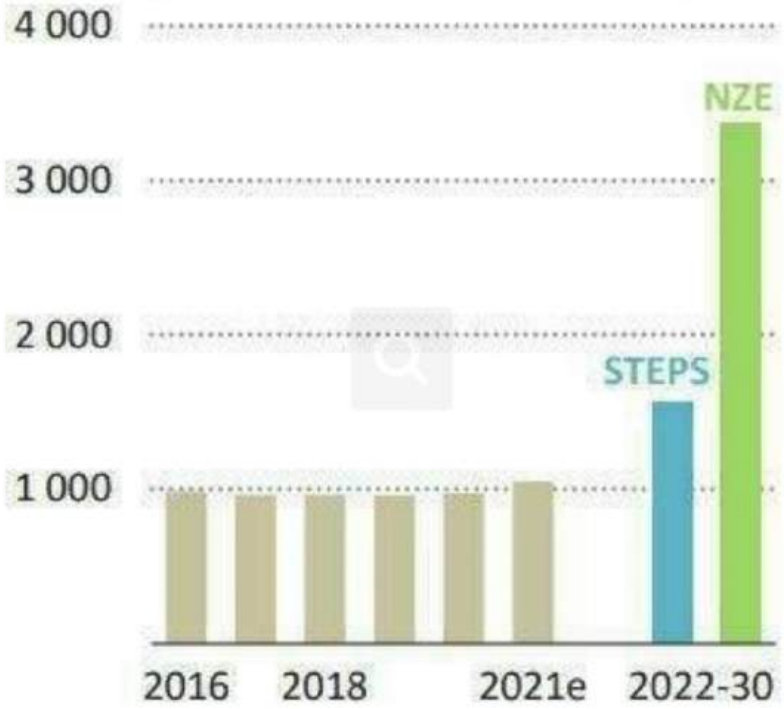
La «Greenflation» è uno scenario molto probabile

Figure 5: Total mineral demand for clean energy technologies (in Mt)



Source: IEA, The role of critical materials in clean energy transitions, March 2022

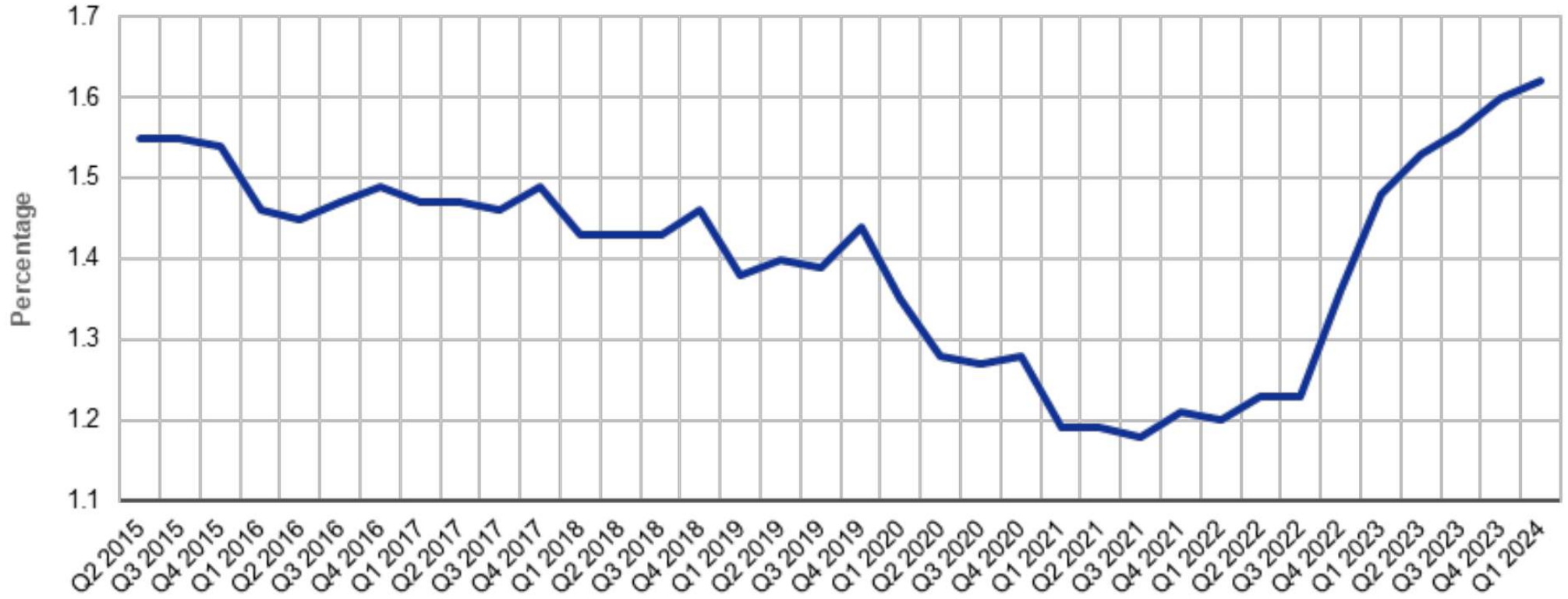
Investment clean energy in the Stated Policies and Net Zero Emissions by 2050 scenarios (Bn USD)



Source: World Energy Outlook 2021, (Oct. 2021) IEA

L’inflazione, oggi, non è un accidente. L’inflazione è una strategia fiscale inconfessata.

Chart 3: Aggregate net interest margin



Sources: Statistical Data Warehouse, ECB based on financial reporting submissions.

Notes: Net interest margin is equal to interest income divided by interest expenses. It is calculated as an aggregate for all significant institutions in countries participating in European banking supervision. The composition of the sample has changed over time to reflect changes in the list of supervised entities.

AGENDA

1) IL PREZZO
- Geopolitical Uncertainty & Central Bank Dominance by Monetary Policy (and Invasive Supervision…)

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- The impact of Generative Artificial Intelligence on banks' & insurances' organizational structure

Money follows Data

$TRUMP vs CBDC: la risposta della BCE

La BCE cita la spinta di Trump verso le stablecoin nella richiesta di euro digitale

By **Abdelaziz Fathi** Gennaio 24, 2025 Gennaio 24, 2025

Condividi

Trump lancia la sua moneta, la cripto $TRUMP vale già miliardi di dollari: è forse una truffa?

Nelle ultime ore gli account ufficiali di Donald Trump hanno lanciato $TRUMP, una meme coin basata sulla piattaforma Solana e creata per celebrare l'insediamento di Trump alla Casa Bianca. Qualche utente chiede se sia una truffa, anche ai danni del presidente eletto. Al momento però non ci sono inidizi certi.

Le decisioni di Trump fanno paura alla BCE: Serve l'Euro Digitale!

Di Daniele Corno

Il supporto di Trump allo sviluppo del settore Stablecoin mette in allarme la BCE: Serve l'Euro Digitale, dice l'ex vice direttore di Banca D'Italia

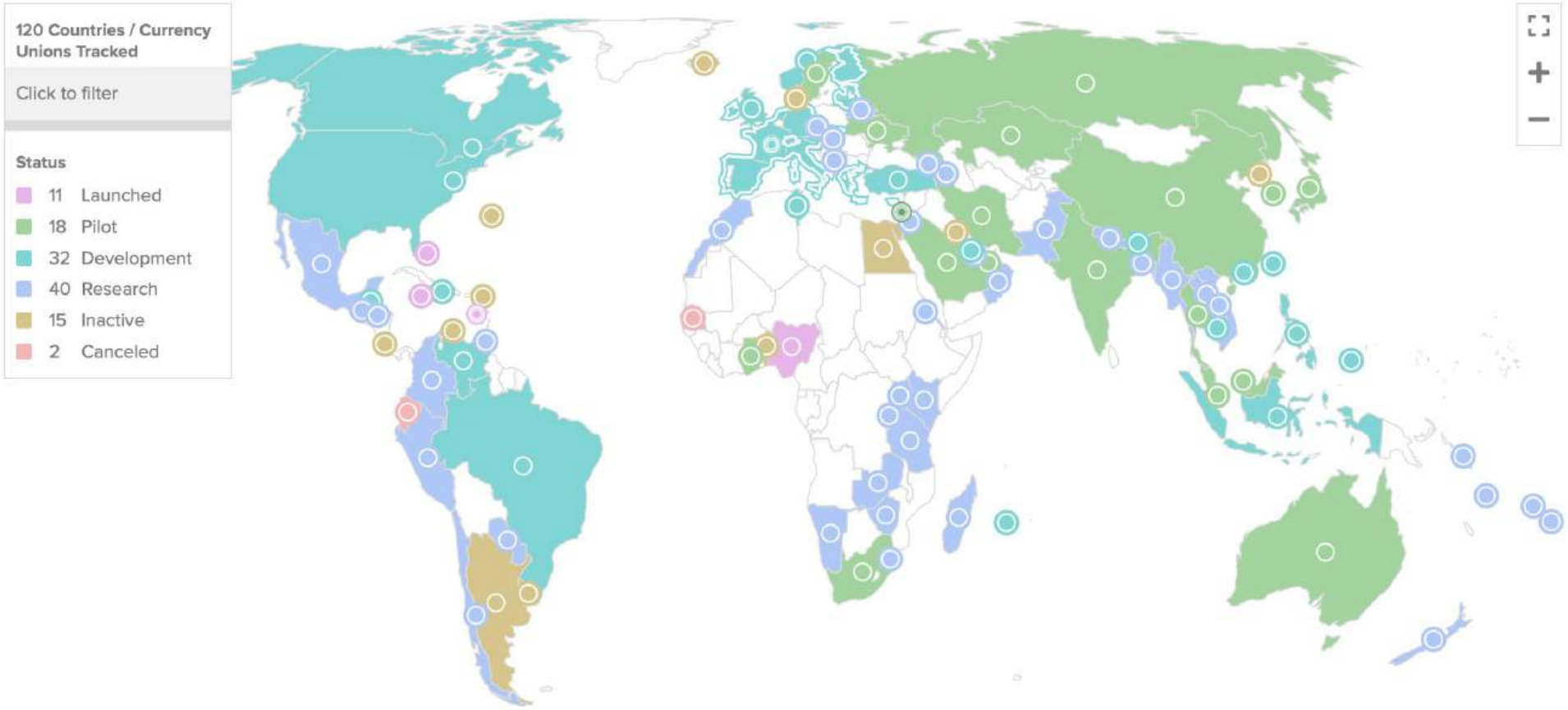
EUROPEAN CENTRAL BANK

EUROSYSTEM

Central Bank Digital Currencies

The future of money

114 projects for CBDCs, covering 95% of global GDP



114 countries, representing over 95 percent of global GDP, are exploring a CBDC. In May 2020, only 35 countries were considering a CBDC. A new high of 60 countries are in an advanced phase of exploration (development, pilot, or launch).

11 countries have fully launched a digital currency, and China's pilot, which reaches 260 million people, is set to expand to most of the country in 2023. Jamaica is the latest country to launch its CBDC, the JAM-DEX.

Financial sanctions on Russia have led countries to consider payment systems that avoid the dollar. There are now 9 cross-border wholesale CBDC tests and 7 cross-border retail projects, nearly double the number from 2021.

Majority of central banks are working on CBDC

- **More than 90%** of central banks are exploring CBDCs,
- **More than half** of the central banks develop CBDC or run concrete experiments,
- **More than two thirds** of central banks consider it likely or might possibly issue a retail CBDC in short or medium term.

Reasons behind the increased work on CBDC		
The **emergence of crypto assets and the Covid-19 pandemic** accelerated the work on CBDCs.	In the advanced economics, **financial stability concerns** have become more important for central banks to deal with CBDCs.	CBDCs could **alleviate limited operating hours of current payment systems** and the **length of current transaction chains** according to central banks.

Source: 2021 BIS survey on central bank digital currencies (2022) of 81 central banks.

China: 260 ml users for e-CNY

China heats up digital currency race w
CNY debut at Olympics

As the digital yuan debuts during the Winter Games, DW looks at how other co
with virtual money ambitions are faring. Spoiler alert: Beijing has been beaten
line and won't be bringing home gold.

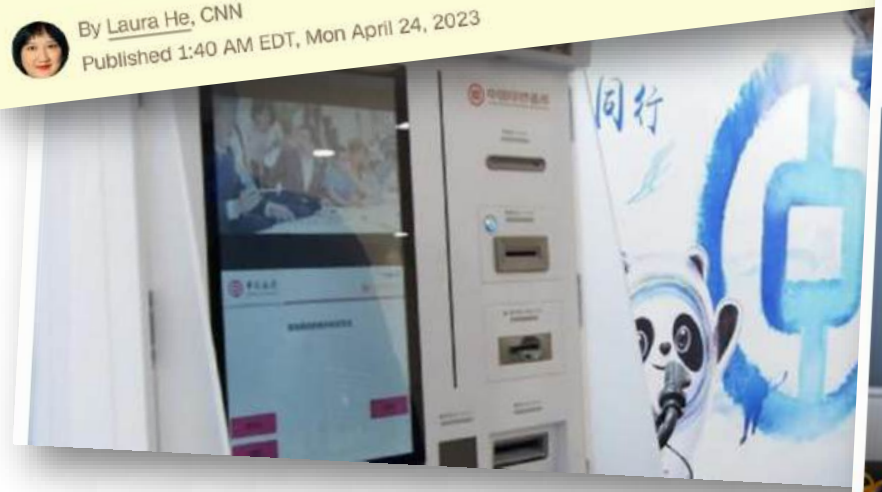
China's digital currency: e-CNY wallet nearly doubles user base in two months to 261 million ahead of Winter Olympics

- The e-CNY app had been used in transactions totalling US$13.8 billion by the end of
ank pushed adoption of its digital currency
l nationwide launch date, but is being trialled in several cities
ues

Why you can trust SCMP

China makes major push in its ambitious digital yuan project

By Laura He, CNN
Published 1:40 AM EDT, Mon April 24, 2023



Future of Money

2 minute read · April 24, 2023 8:27 AM GMT+2 · Last Updated 13 days ago

Chinese digital currency stocks surge amid new efforts to promote e-CNY

Reuters

A sign indicating digital yuan, also referred to as e-CNY, is pictured at a shopping mall in Shanghai,

BUSINESS

China heats up digital currency race with e-CNY debut at Olympics

As the digital yuan debuts during the Winter Games, DW looks at how other countries with virtual money ambitions are faring. Spoiler alert: Beijing has been beaten to the finish line and won't be bringing home gold.

PBOC's development of digital yuan

2014
PBOC set up a research group to study central bank digital currency (CBDC)

Jan. 2017
PBOC established the Digital Currency Research Institute. Hiring IT/cryptography experts

Aug. 2019
PBOC official reveals that its CBDC is "on the verge of release"

Apr. 2020
PBOC ran CBDC internal testing together with the Agricultural Bank of China

Apr. 2021
e-CNY pilot program expanded to 10 cities and Winter Olympics

Sep, 2016
PBOC staff published a series of research papers on digital currencies including CBDC

Dec. 2017
PBOC invited Chinese commercial banks and payment institutions to join efforts in developing its CBDC

DEC. 2019
PBOC announces CBDC pilot project is expected to be launched in 4 cities

Nov. 2020
First public e-CNY pilot run launched in Shenzhen

Feb. 2022
Live launch during the Winter Olympic Games

DW Source: Deutsche Bank Research

March 16, 2022
11:18 AM GMT+1
Last Updated 18 days ago

Future of Money

Ukraine crisis may reshape role of c.bank digital currency, says ex-BOJ official

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By Leika Kihara and Takahiko Wada

2 minute read

CBDC networks could defang sanction threats

by Lewis McLellan 2 March 2022

Russia-Ukraine: Could Central Bank Digital Currencies Help Countries Bypass Sanctions?

BloombergQuintOpinion

Sabyasachi Kar @Sabya_K

Priyadarshini D

Bookmark

Published on March 16 2022, 12:19 PM
Last Updated on March 16 2022, 9:18 PM

Russia's biggest bank has been cut out of the global financial markets — and now it's launched a cryptocurrency.

Adam Morgan McCarthy Apr 2, 2022, 5:00 A

- Russia's biggest bank got permission to issue a digital currency just weeks after the invasion of Ukraine.
- Sberbank launched sbercoin as Western sanctions hampered Russia's access to the global financial system.
- The US and its allies are concerned about Russian use of crypto to circumvent sanctions.

EUROPEAN CURRENCY NEWS MARCH 17, 2022 / 5:46 PM / UPDATED 17 DAYS AGO

Russian c.bank gives Sberbank licence to issue, exchange digital assets

2 MIN READ

By Reuters Staff

India Central Bank boosts Digital Rupie with Unified Payment Interface

India central bank, banks plan new features to boost digital-currency transactions

By Jaspreet K...

Sept...

La rupia digitale guadagna una notevole fruibilità grazie all'integrazione di Yes Bank con UPI

L'integrazione UPI dell'app di Yes Bank è la principale novità per la CBDC indiana, che vanta una serie di progetti dal lancio pilota avvenuto a dicembre.

Digital Rupee gets big boost: SBI, six other bank customers can scan UPI QR code and pay via digital rupee. Here is how

1 min read • 05 Sep 2023, 12...

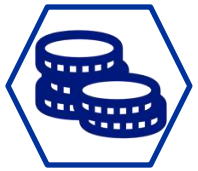
YES BANK
@YESBANK · Segui

We are pleased to share that YES BANK has gone live with Unified Payments Interface (UPI) interoperability on the Reserve Bank of India (RBI) Central Bank Digital Currency (CBDC) app.

With this, users can simply scan any UPI enabled QR Code through the YES BANK Digital Rupee... Mostra altro

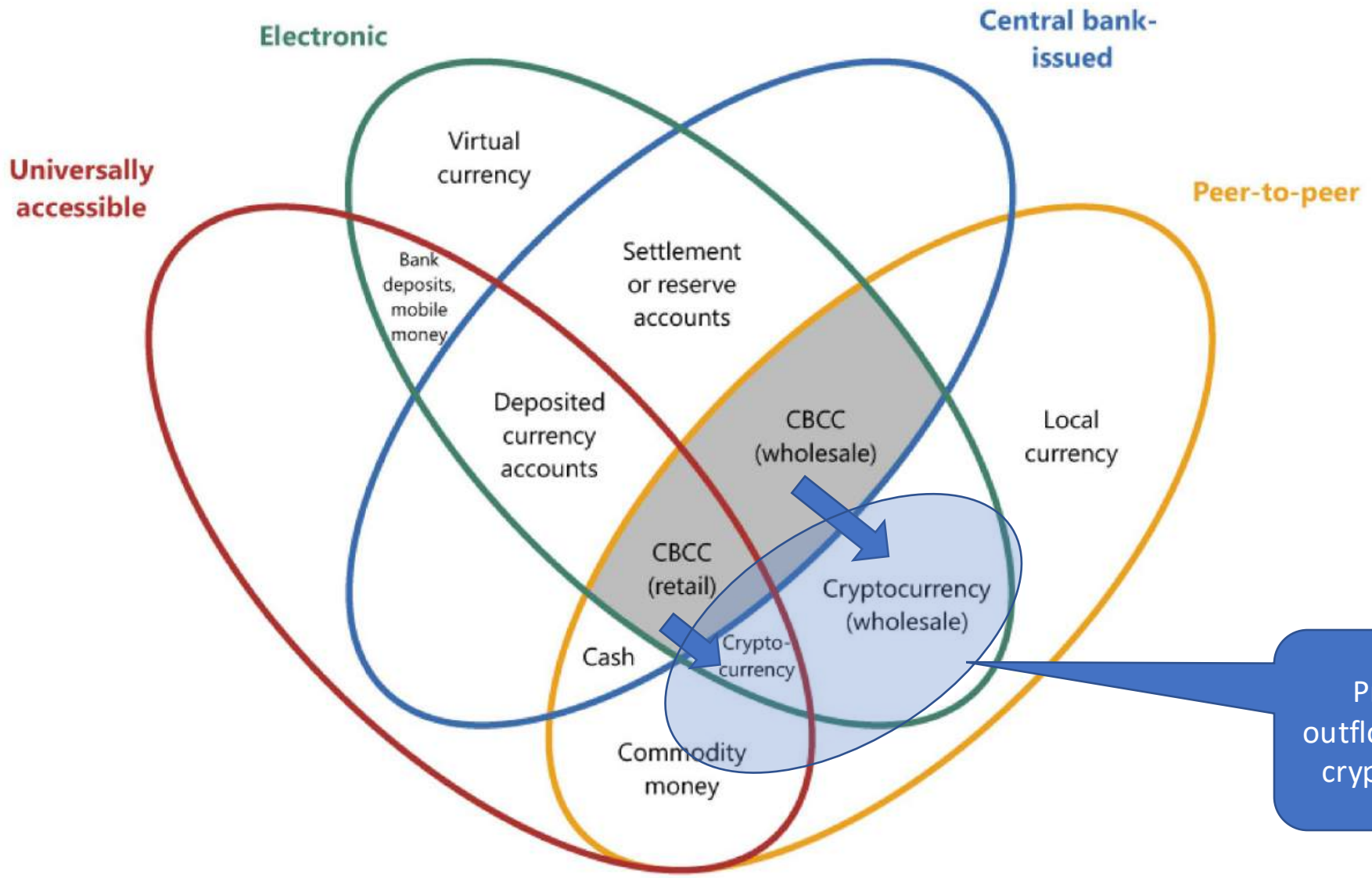
Why issue a digital euro?

The digital euro as **monetary anchor** would preserve public access to central bank money being **widely accessible to prospective users in all euro area countries.**



A digital euro would strengthen the **strategic autonomy** of the euro area by increasing the independence from non-European payment solutions and would increase **economic efficiency** as the (latent) competition from central bank money to private money providers can curb market-abusive behaviour.

"Money flower" graph



Digital Euro: the Roadmap

Q4 – 2023

- Setting up the preparation phase
- Publication of **ECB legal opinion**

Q2 - 2024

- Start engagement with market on **calibration of holding limits**

Q4 - 2024

- **Evaluation** and **negotiation** of procurement offers

Q2 - 2025

- **Selection of providers**
- Finalise **Architecture**
- **Data Protection Impact Assessment**
- **Positioning and Outreach plan**
- Detail out piloting and rollout approach

Q1 - 2024

- RDG review of **Rulebook**
- Publication of **Call for Applications** (CfA)
- Draft **requirements** related to sourcing

Q3 - 2024

- **Procurement documentation** sent to tenderers
- Initiate **user research**

Q1 - 2025

- **Negotiation** of procurement offers
- Initiate activities for 2nd round of **procurement** procedures
- **Initiate** planning for next phase

Q3 - 2025

- **Draft rulebook** ready
- Preparation of **Governing Council** decision

October 2025
Governing Council decision for potential launch of next phase

Digital euro use cases

A digital euro use case describes a common payment scenario

- **Person-to-person** (P2P): a payment between two people
- **Consumer-to-business:** a payment for goods or services purchased in a **physical store** (point-of-sale payment) or online via **e-commerce**
- **Business initiated payments:** a payment from a firm to another firm (B2B) or to an individual (B2P, e.g., wages)
- **Payments to the government** (X2G, e.g., taxes) and **by the government** (G2X, e.g., allowances and subsidies)
- **Machine-initiated** (M2X): a fully automated payment initiated by a device and/or software based on predetermined conditions.

Forms of digital central bank money

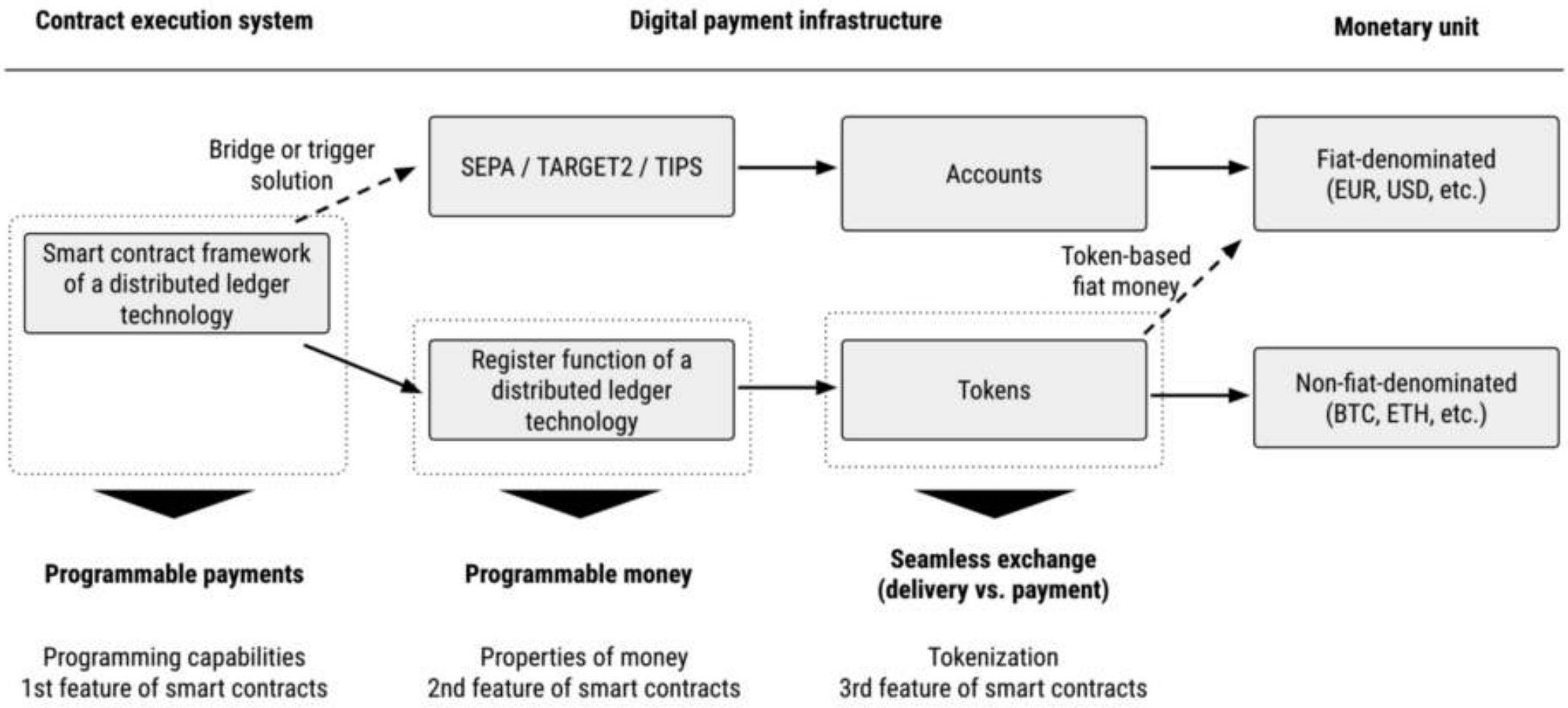
Source: BIS elaboration

Relevance

- **Wholesale CBDCs would similarly be restricted to financial institutions.** Retail CBDCs in contrast are available to the general economy.
- **Account-based retail CBDCs would be tied to an identification scheme** and all users would need to identify themselves.
- **Token-based retail CBDCs would be accessed via password-like digital signatures** and could be accessed anonymously.

Digital Access (account) or Token Signature

Programmable Money & Smart Contract



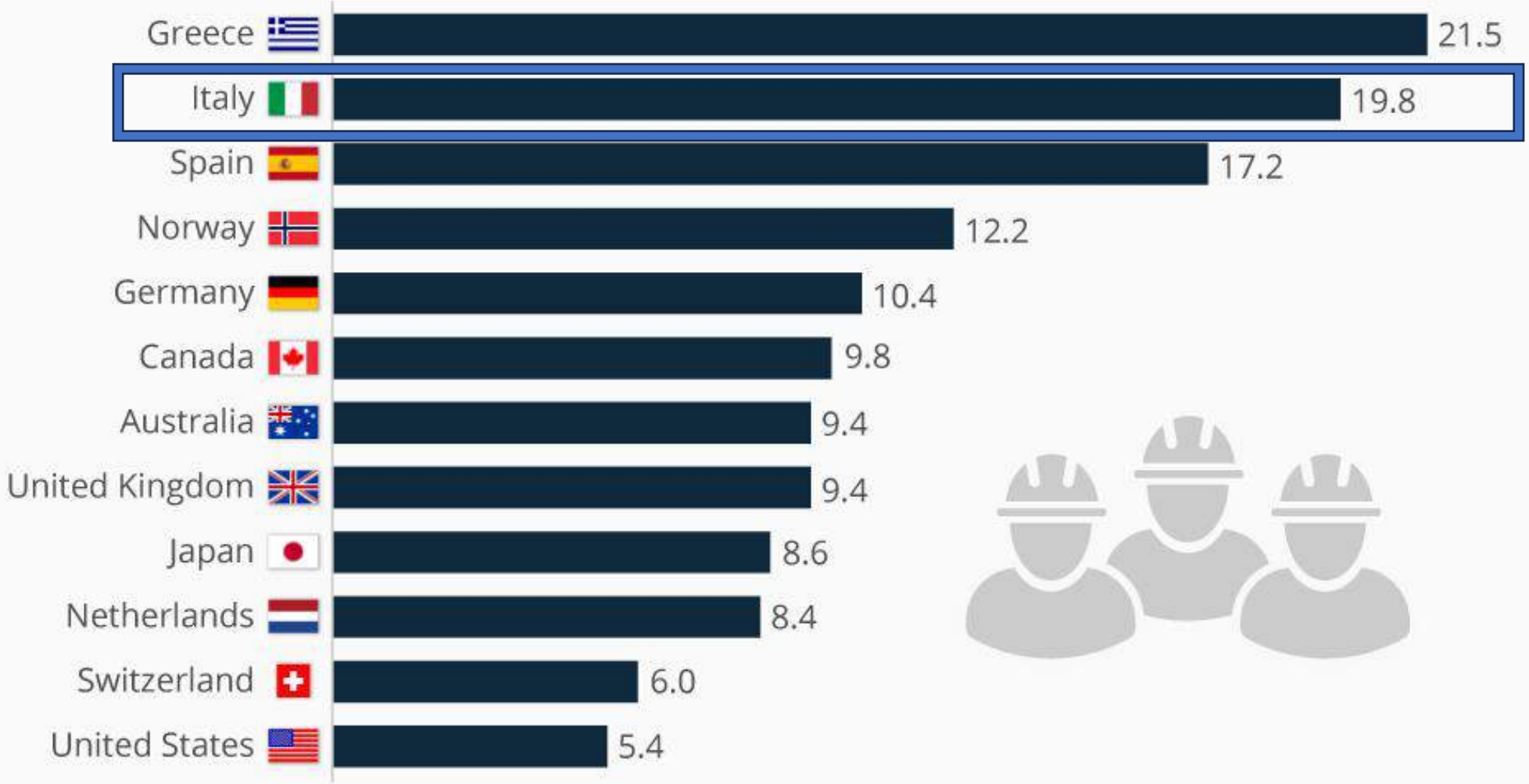
Meet the Digital Currency: smart contract in pseudo-code

```
1  function transfer(parcel, recipient, service, amount)
2    require([...]); //initial checks: spender authorized? Amount available?
3    newPolicies[] = [];
4    foreach (policy in parcel.policies)
5      if (!policy.check(sender, recipient, service, amount))
6        return false; //if the policy forbids the transfer, terminate
7      else
8        newPolicies.append(policy.getNextPolicies(sender, recipient, service,
             amount));
9    parcel.subtract(amount); //remove amount from old parcel
10   newParcel = Parcel(recipient, newPolicies, amount); // new parcel with new
       policies
```

Listing 1: Pseudo code of policy-aware transfer function

Where Shadow Economies Are Well Established

Shadow economy as a percentage of GDP in selected countries (2017)*



Shadow economy is the part of an economy involving goods and services which are paid for in cash, not declared for tax and therefore not actually part of the GDP

Source: IAW

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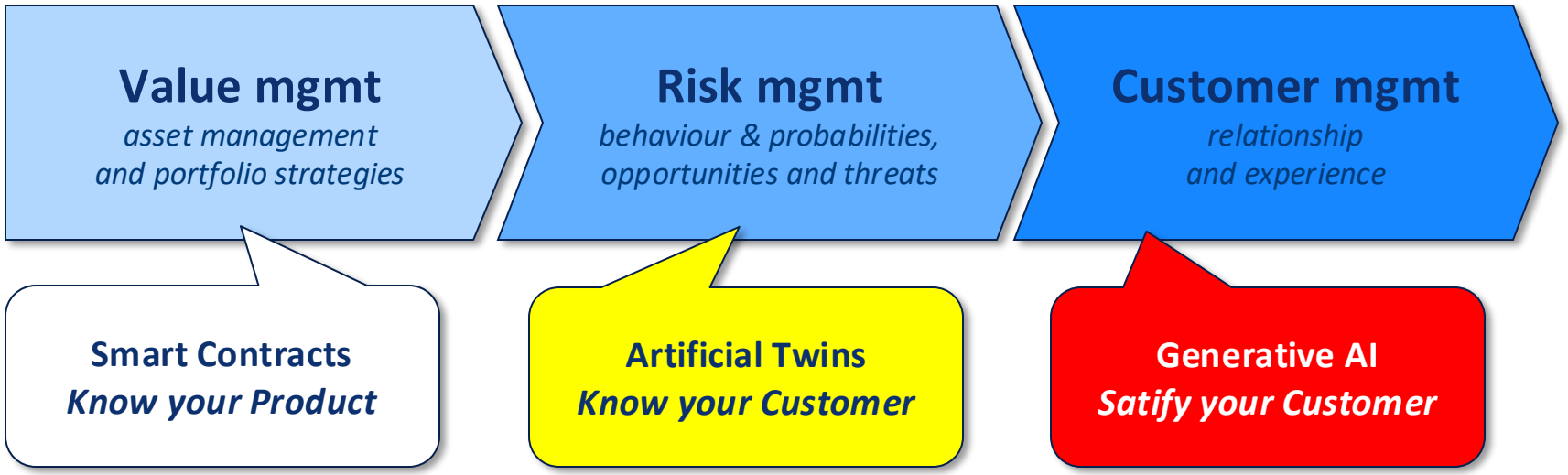
La tecnologia cambia i processi di banking e assicurazione

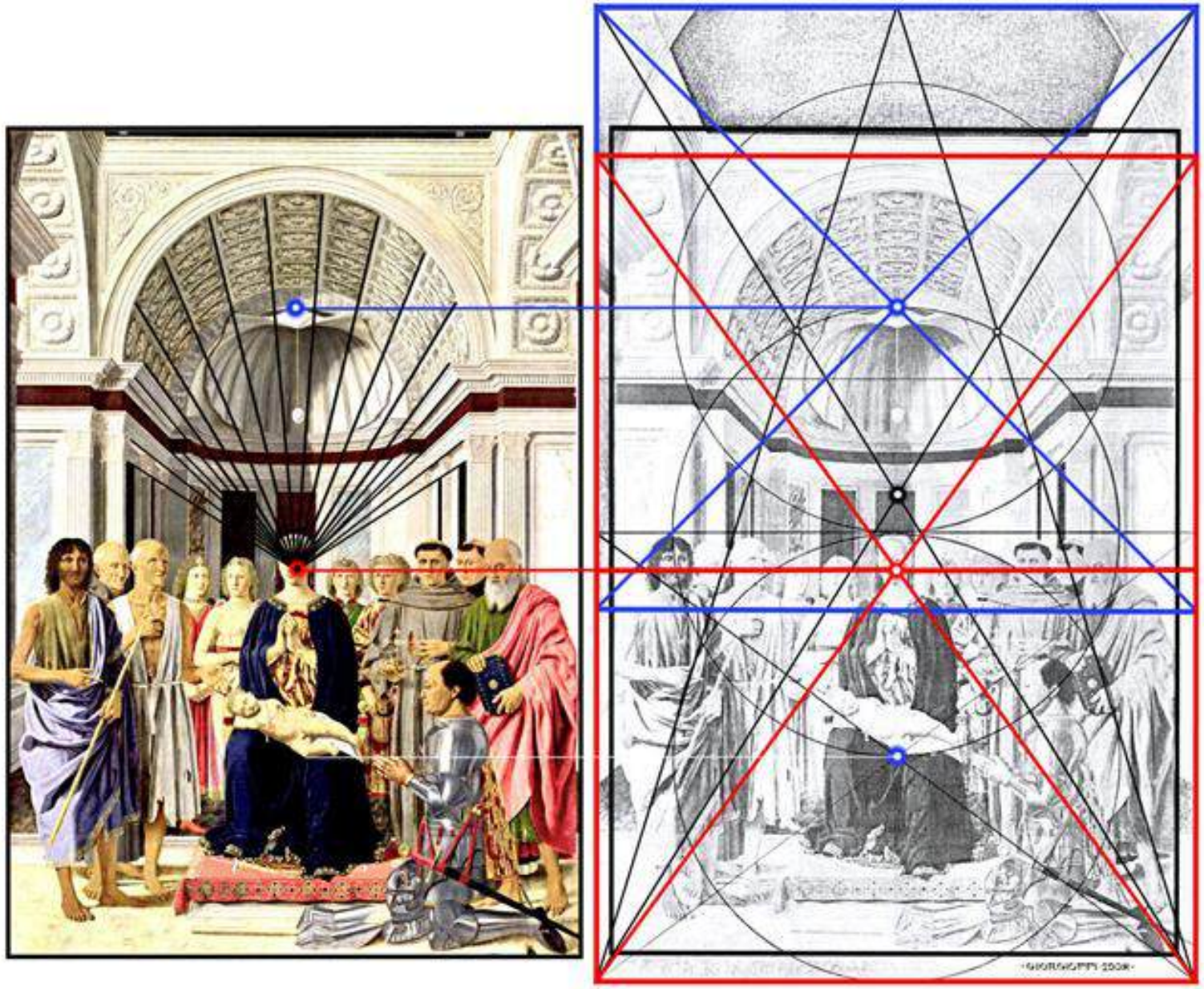


Business Fintech Needs	Personal Customers	Corporate Customers
KYP - Know Your Product	*Asset/Portfolio Mngm*	*Lending/Fund Raising*
KYC – Know Your Customer	*Behavioural Profiling*	*Risk Mngm-as-a-Service*
SYC – Satisfy Your Customer	*Customer Experience*	*Capital-as-a-Service*

Source: Chen & al., NLP in FinTech Applications: Past, Present and Future, Cornell University, 2021. https://arxiv.org/abs/2005.01320

Il pappagallo di Pico della Mirandola

ChatGPT? Un incrocio tra Pico della Mirandola e un pappagallo stocastico (nonché un vampiro semantico…)

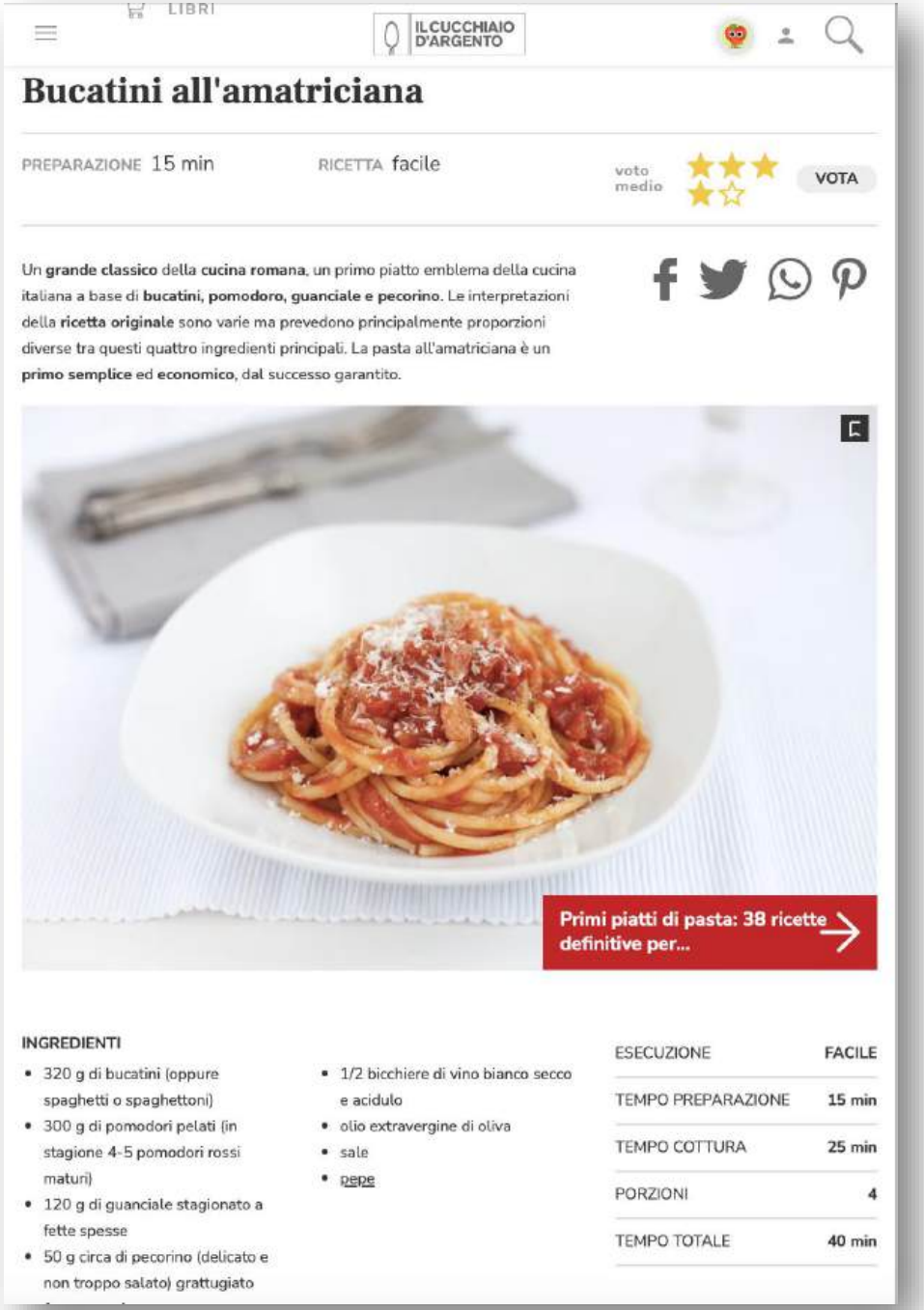


La «Generative AI»? L'ha inventata Piero della Francesca…

L'ILLUSIONE DELLA PROFONDITÀ E L'ILLUSIONE DEL SENSO

Ci sono due modi per fare l'amatriciana…

(voi dovete fare la «mamma»…)



LIBRI

IL CUCCHIAIO D'ARGENTO

Bucatini all'amatriciana

PREPARAZIONE 15 min RICETTA facile voto medio VOTA

Un **grande classico** della **cucina romana**, un primo piatto emblema della cucina italiana a base di **bucatini, pomodoro, guanciale e pecorino**. Le interpretazioni della **ricetta originale** sono varie ma prevedono principalmente proporzioni diverse tra questi quattro ingredienti principali. La pasta all'amatriciana è un **primo semplice** ed **economico**, dal successo garantito.

Primi piatti di pasta: 38 ricette definitive per...

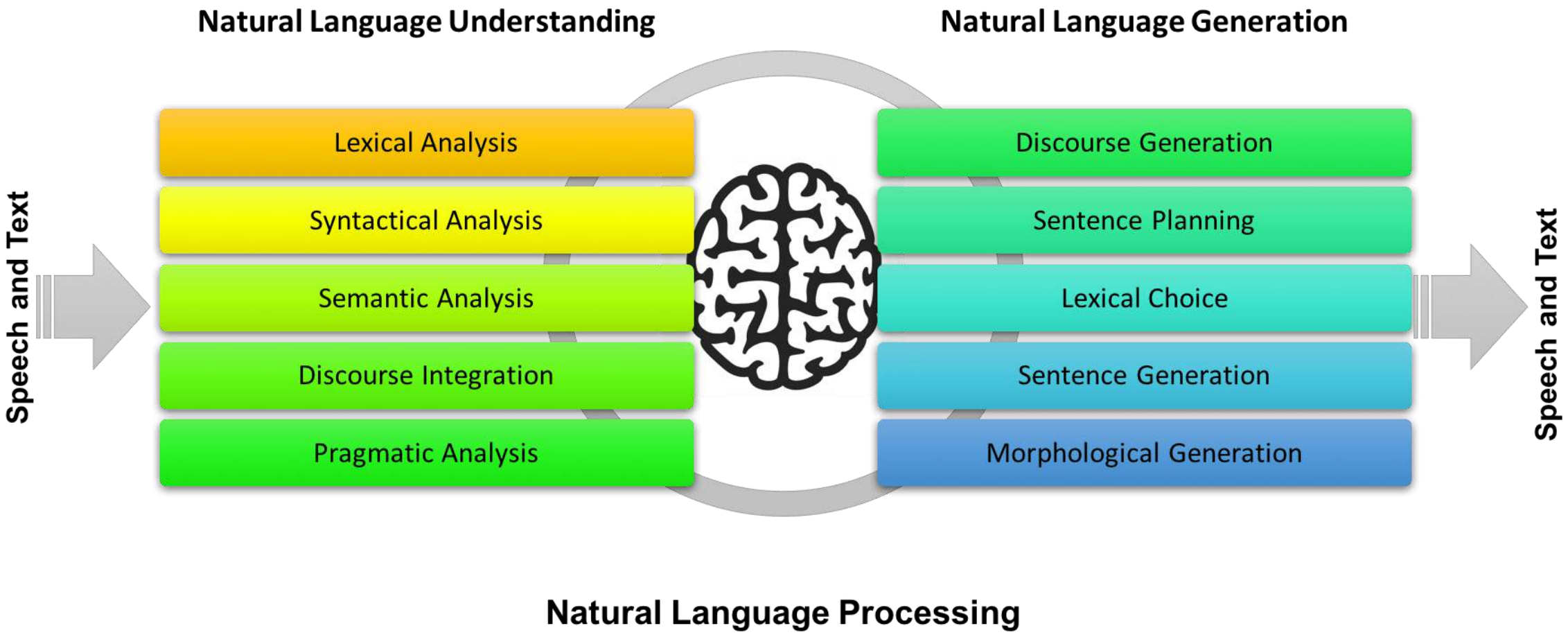
INGREDIENTI

- 320 g di bucatini (oppure spaghetti o spaghettoni)
- 300 g di pomodori pelati (in stagione 4-5 pomodori rossi maturi)
- 120 g di guanciale stagionato a fette spesse
- 50 g circa di pecorino (delicato e non troppo salato) grattugiato
- 1/2 bicchiere di vino bianco secco e acidulo
- olio extravergine di oliva
- sale
- pepe

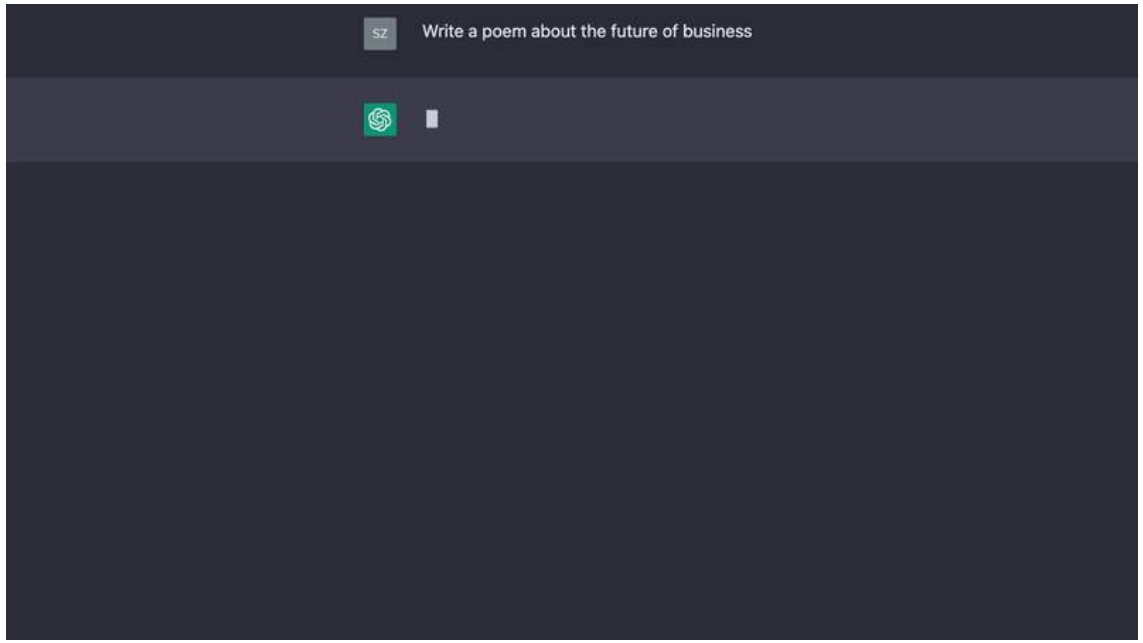
ESECUZIONE	FACILE
TEMPO PREPARAZIONE	15 min
TEMPO COTTURA	25 min
PORZIONI	4
TEMPO TOTALE	40 min

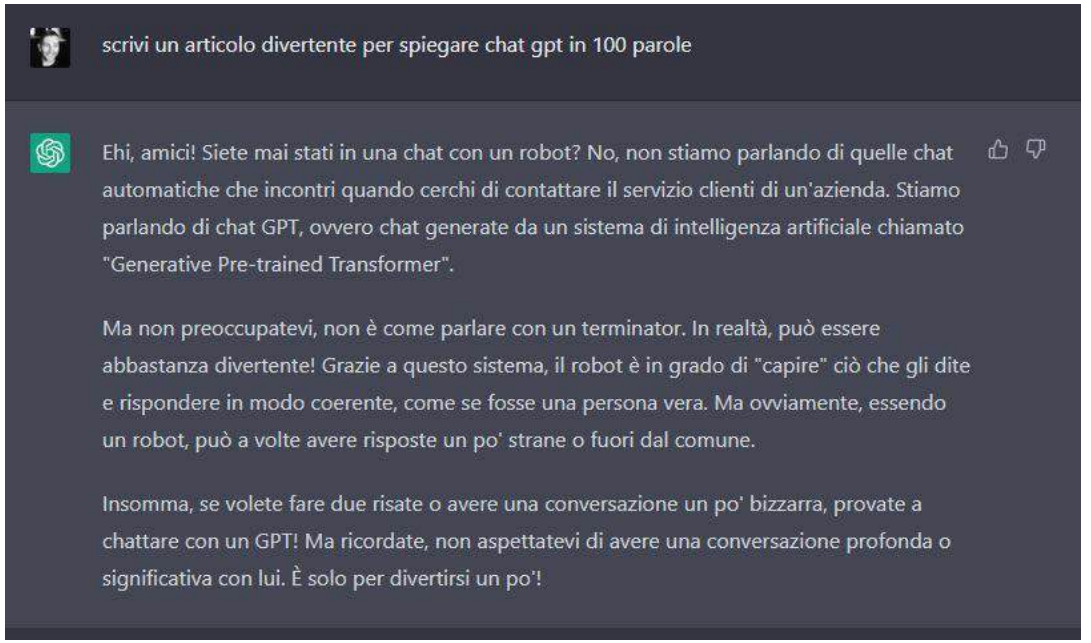
L'AI sapeva già leggere e ascoltare.
Oggi ha imparato a scrivere e a dialogare.

(mentre noi siamo ancora qui a far compilare moduli…)



ChatGPT: la rivoluzione del linguaggio naturale con la Generative AI





DeepSeek scuote la Silicon Valley

	Benchmark (Metric)	Claude-3.5-Sonnet-1022	GPT-4o 0513	DeepSeek V3	OpenAI o1-mini	OpenAI o1-1217	DeepSeek R1
	Architecture	-	-	MoE	-	-	MoE
	# Activated Params	-	-	37B	-	-	37B
	# Total Params	-	-	671B	-	-	671B
English	MMLU (Pass@1)	88.3	87.2	88.5	85.2	**91.8**	90.8
	MMLU-Redux (EM)	88.9	88.0	89.1	86.7	-	**92.9**
	MMLU-Pro (EM)	78.0	72.6	75.9	80.3	-	**84.0**
	DROP (3-shot F1)	88.3	83.7	91.6	83.9	90.2	**92.2**
	IF-Eval (Prompt Strict)	**86.5**	84.3	86.1	84.8	-	83.3
	GPQA Diamond (Pass@1)	65.0	49.9	59.1	60.0	**75.7**	71.5
	SimpleQA (Correct)	28.4	38.2	24.9	7.0	**47.0**	30.1
	FRAMES (Acc.)	72.5	80.5	73.3	76.9	-	**82.5**
	AlpacaEval2.0 (LC-winrate)	52.0	51.1	70.0	57.8	-	**87.6**
	ArenaHard (GPT-4-1106)	85.2	80.4	85.5	92.0	-	**92.3**
Code	LiveCodeBench (Pass@1-COT)	38.9	32.9	36.2	53.8	63.4	**65.9**
	Codeforces (Percentile)	20.3	23.6	58.7	93.4	**96.6**	96.3
	Codeforces (Rating)	717	759	1134	1820	**2061**	2029
	SWE Verified (Resolved)	**50.8**	38.8	42.0	41.6	48.9	49.2
	Aider-Polyglot (Acc.)	45.3	16.0	49.6	32.9	**61.7**	53.3
Math	AIME 2024 (Pass@1)	16.0	9.3	39.2	63.6	79.2	**79.8**
	MATH-500 (Pass@1)	78.3	74.6	90.2	90.0	96.4	**97.3**
	CNMO 2024 (Pass@1)	13.1	10.8	43.2	67.6	-	**78.8**
Chinese	CLUEWSC (EM)	85.4	87.9	90.9	89.9	-	**92.8**
	C-Eval (EM)	76.7	76.0	86.5	68.9	-	**91.8**
	C-SimpleQA (Correct)	55.4	58.7	**68.0**	40.3	-	63.7

Poonam Soni

Table 4 | Comparison between DeepSeek-R1 and other representative models.

Differenti strategie per la rivoluzione della Generative AI

- **USA**: a trillion dollar investment
- **China**: a billion technicians and engineers
- **European Union**: a thousand-page regulation

L’Europa ha finalmente l’AI Act. Adesso manca solo l‘AI.

AI Act, il Parlamento europeo approva la prima legge al mondo sull'intelligenza artificiale

di Francesca Basso

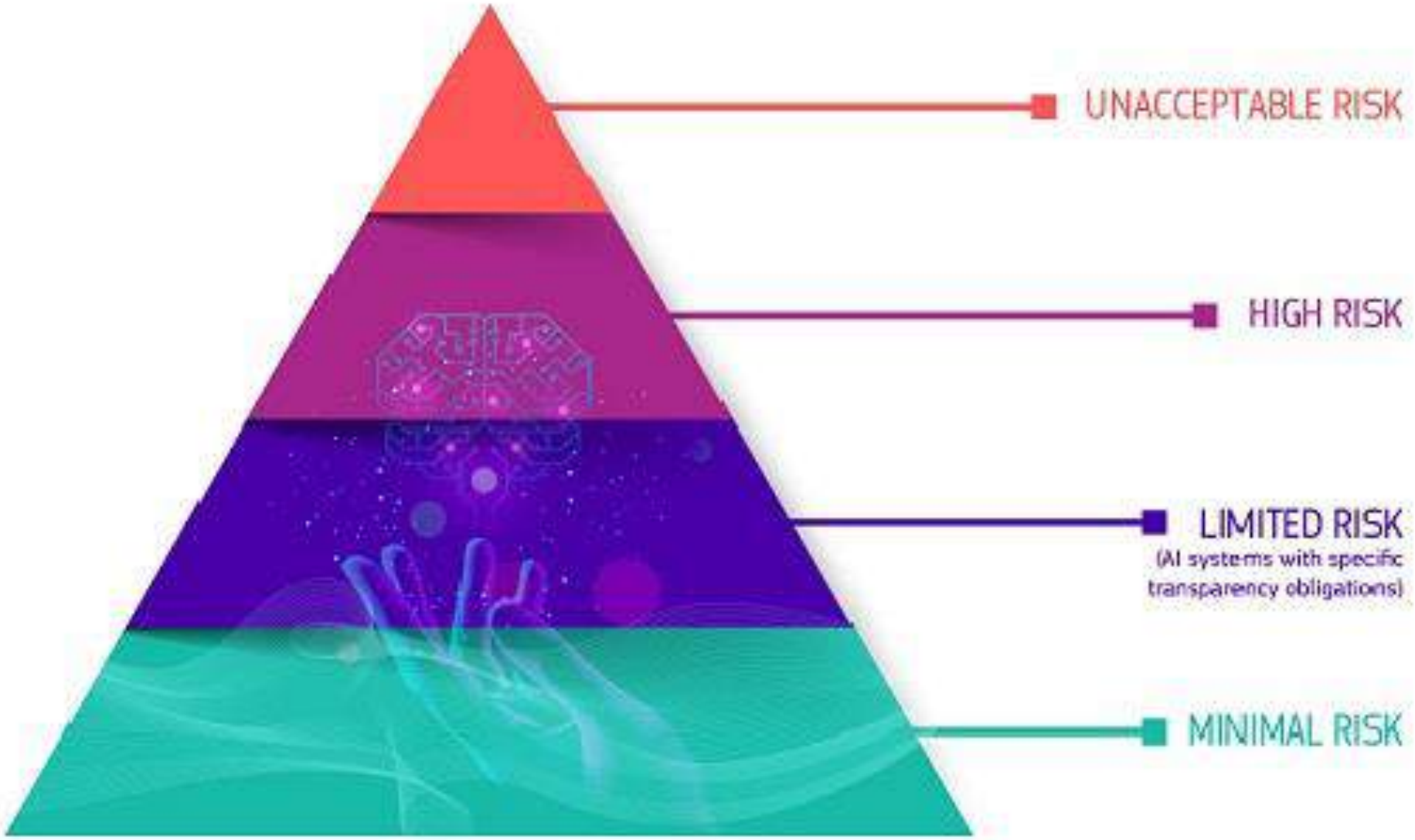
Con 523 voti a favore, si è concluso il lungo iter legislativo per provare a regolamentare (per la prima volta) le applicazioni di intelligenza artificiale. La legge entrerà ufficialmente in vigore tra due anni

Immagine creata con Dall-E 3

CORRIERE TV

Arriva la prima legge europea che regola l’Intelligenza Artificiale: cosa sono i 4 livelli di rischio

AI ACT EUROPEO



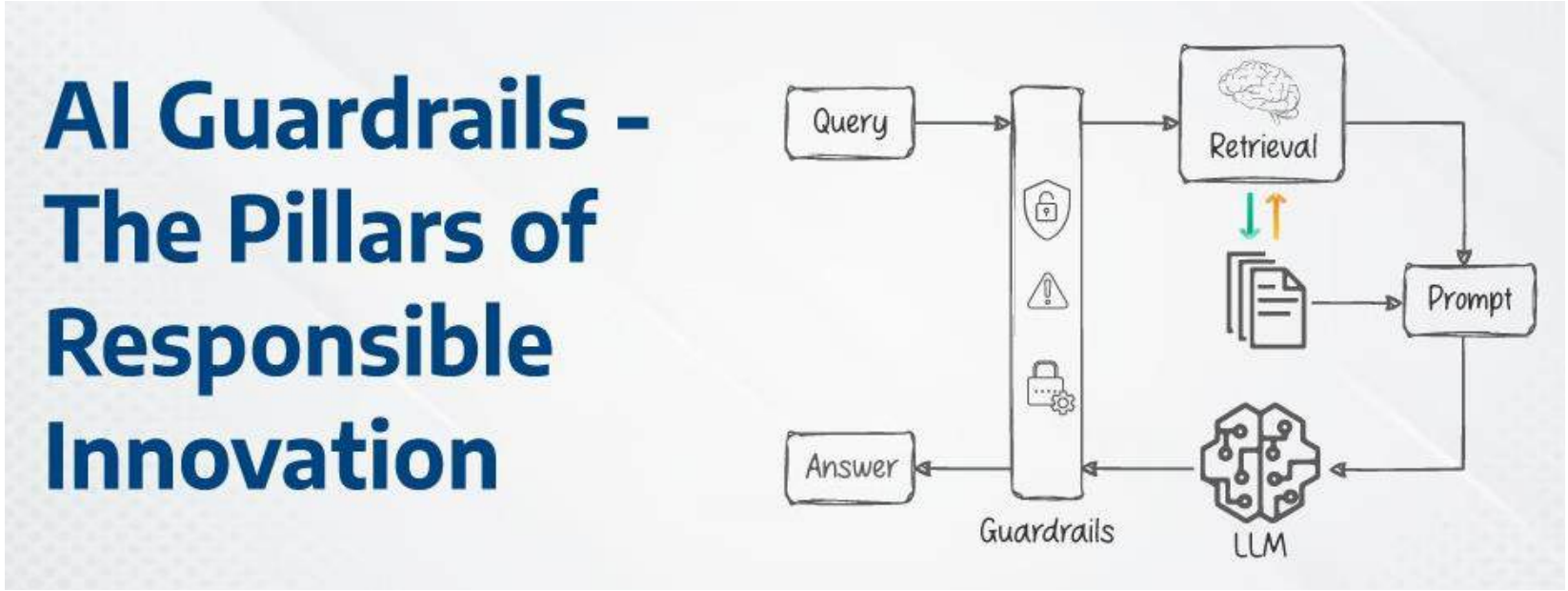
PROVATE A SVILUPPARE UN'APPLICAZIONE DI A.I. IN EUROPA, DOPO L'AI ACT. ECCO CIO' CHE DOVRETE FARE (PRIMA…)

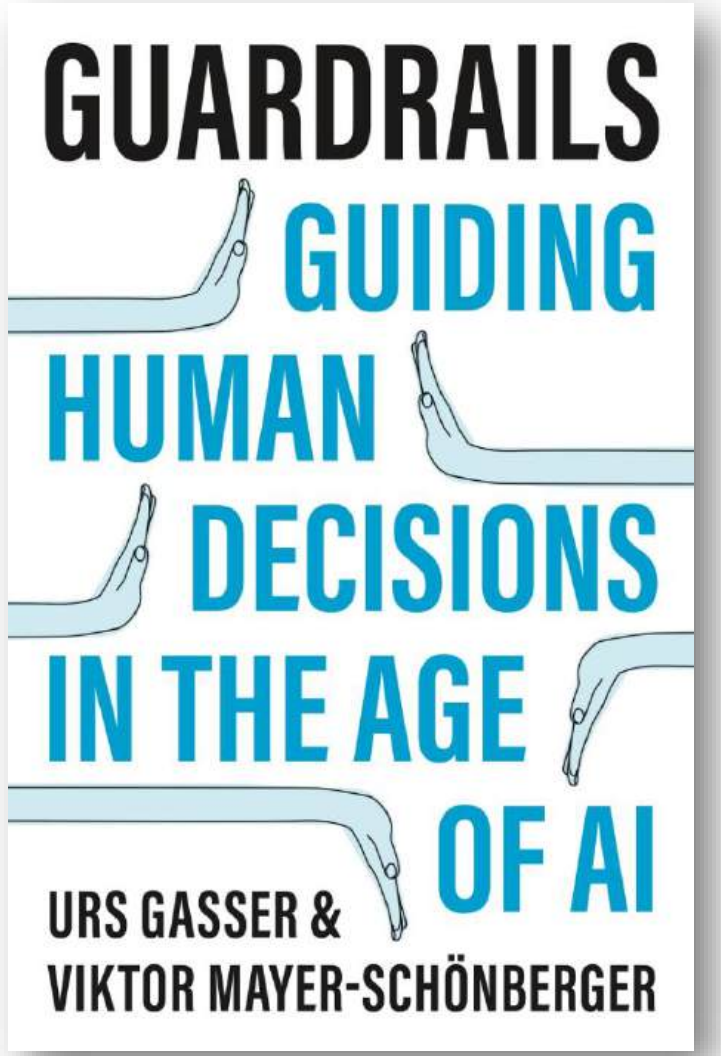
Immagina di avere una start-up e di aver costruito un'applicazione di AI per l'educazione – un caso d'uso ovvio e valido.
Prima di poterlo rilasciare nell'UE, devi fare quanto segue:

1. Creare un «**sistema di gestione del rischio**» rigoroso e completo (Article 9, p. 56).
2. Garantire che il sistema sia addestrato su dati che abbiano le "**proprietà statistiche appropriate**" (Article 10, p. 57).
3. Redigere una «**documentazione tecnica dettagliata**» prima di qualsiasi rilascio (Article 11, p. 58).
4. Creare una "**registrazione automatica degli eventi durante l'intera vita del sistema**" (Article 12, p. 59).
5. Costruire un sistema affinché l'operatore e l'autorità di controllo possano "**interpretare l'output del sistema**" (Article 13, p. 59)
6. Incorporare funzioni per la "**supervisione umana**" e un "**pulsante di arresto**" (Article 14, p. 60)
7. Creare un «**completo sistema di cybersecurity**» (Article 15, p. 61).
8. Creare un "**sistema di gestione della qualità**" che includa "**l'installazione, implementazione e manutenzione di un sistema di monitoraggio post-mercato**". (Article 17, p. 62).
9. Mantenere tutto ciò per i **prossimi 10 anni (**Article 18, p. 63**)**.
10. Nominare un "**rappresentante autorizzato che sia stabilito nell'Unione**" (Article 22, p. 65)
11. Sottoporsi a una "**valutazione di conformità**" verificando di aver fatto quanto sopra con **un'autorità designata** e **ricevere un certificato ufficiale (**Article 43, p. 78**)**.
12. Sottoporsi a una «**valutazione d'impatto sui diritti fondamentali**» e inviarla all'Autorità di Vigilanza del Mercato (Article 27, p. 69).
13. Redigere una «**Dichiarazione di Conformità UE**» (Article 47, p. 80).
14. Registrarsi in un «**database ufficiale dell'UE**» che deve contenere tutte le applicazioni di AI (Article 49, p. 81).

In caso di errore, si rischia **una multa fino a un massimo di 15 milioni di euro o del 3% del fatturato totale** (Article 99, p. 115).

SULLE AUTOSTRADE DELL'INFORMAZIONE ARTIFICIALE, IMPARATE A COSTRUIRE «GUARDRAIL» ILLUMINATI





AI Guardrail

An AI guardrail is a safeguard that is put in place to prevent artificial intelligence (AI) from causing harm. AI guardrails are a lot like highway guardrails – they are both created to keep people safe and guide positive outcomes.

As AI evolves, guardrails are becoming increasingly important for maintaining public trust in AI and ensuring that AI-enabled technology operates safely within ethical and legal boundaries...

L’Unione Europea è ultima rispetto a USA e Cina nel ciclo di investimenti privati in intelligenza artificiale

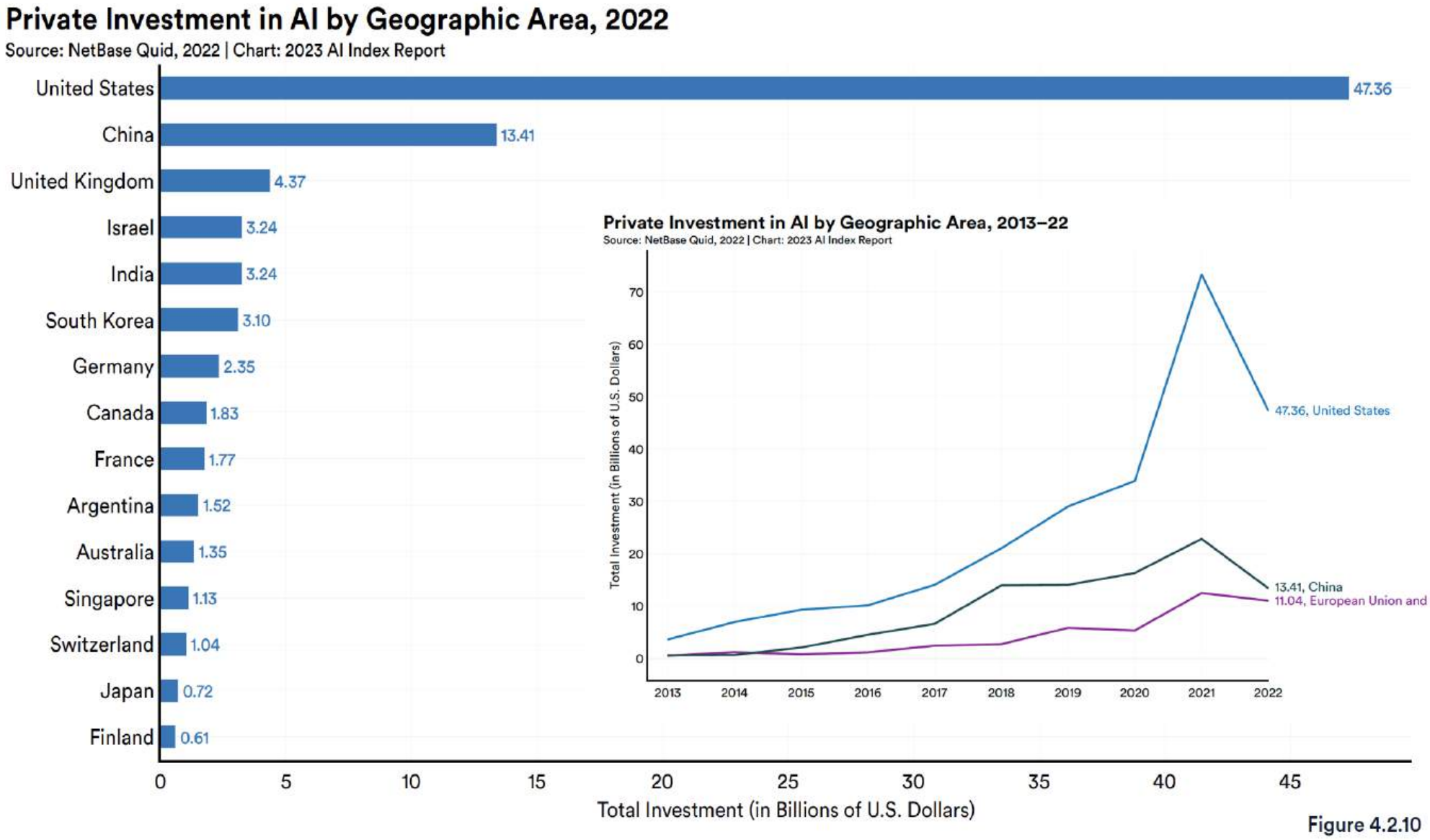


Figure 4.2.10

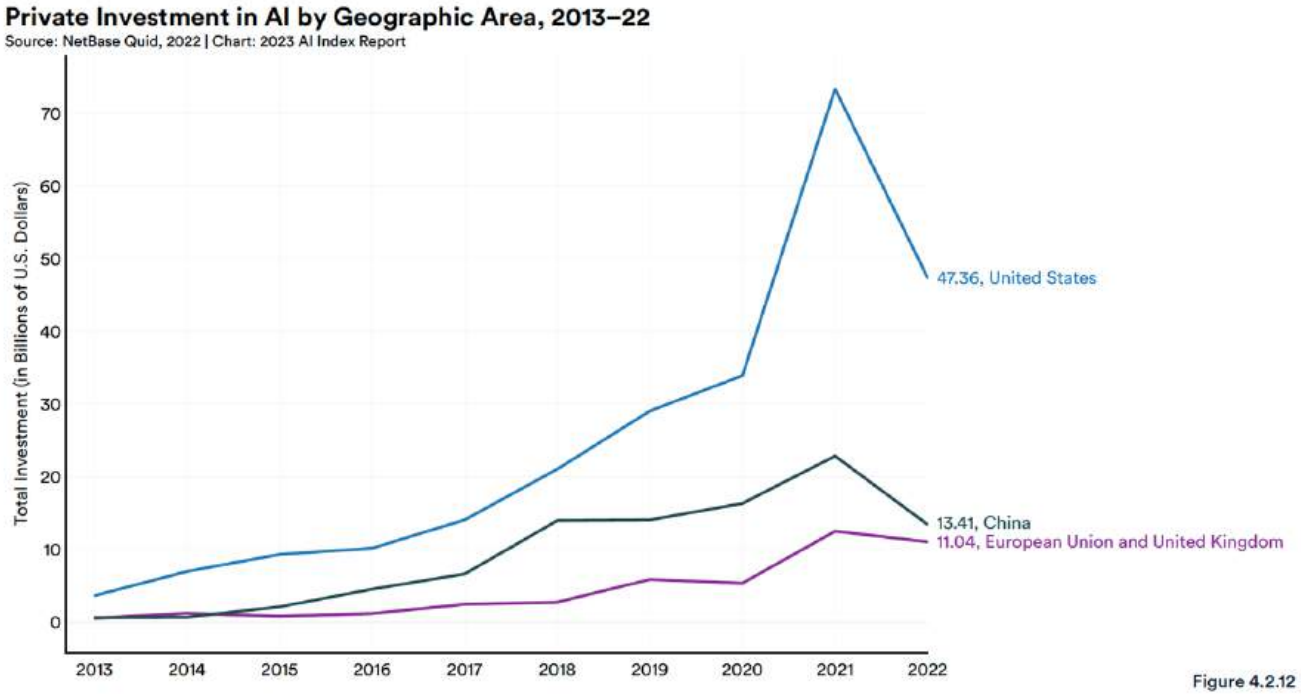


Figure 4.2.12

Whatever Europe Takes

Le tre grandi sfide industriali per l’Europa:

- **Innovazione**
- **Energia**
- **Difesa e Sicurezza**

Un piano Marshall da 800 miliardi. All'anno, per 5 anni

Servirebbero 450 mld/anno per la transizione energetica, 150 mld/anno sulle tecnologie digitali, 50 mld/anno su difesa e sicurezza, 100-150 mld/anno per produttività e innovazione. Il tutto per almeno 5 anni, e da un bilancio federale, non frammentato per 27 paesi

Annual additional investment needs (2025-2030)

In EUR billion

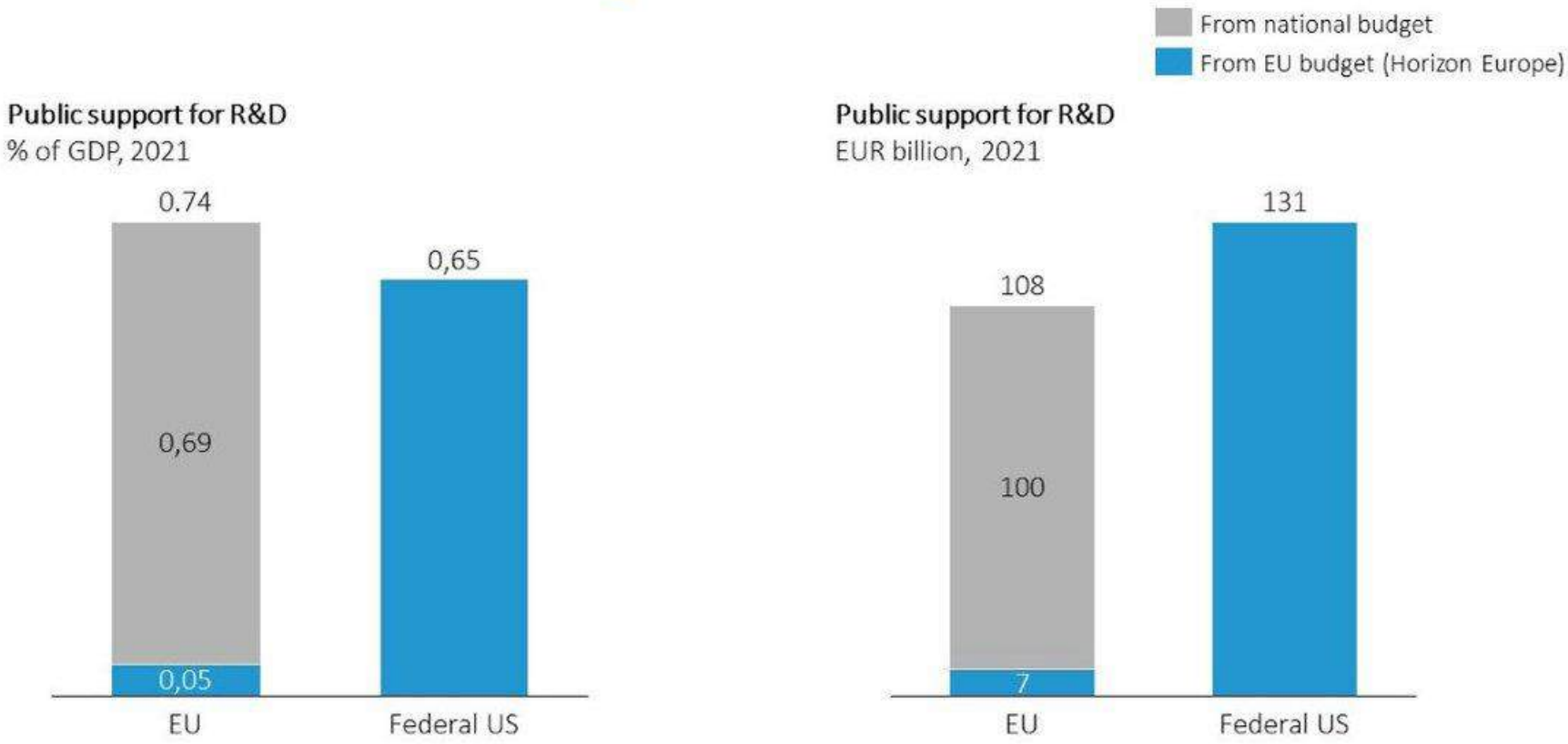
Investment category		**2025-2030**
Achieving the energy transition	Energy (including the deployment of clean technologies)	300
	Transport (including charging infrastructure)	150
	Total	450
Becoming a leader in digital technologies		150
Strengthening defence and security capabilities		50
Boosting productivity through breakthrough innovation		100;150
Total annual additional investment needs		**750;800**
ECB estimate		*771*

Source: Own calculations based on Commission estimates

R&D: i limiti della frammentazione nazionale europea

L'Europa non investe poco in R&D, ma investe male, perchè politica e imprese hanno timore dell'innovazione e si muovono in ordine sparso. Il gap di investimenti rispetto agli USA è enorme nelle modalità: il budget federale di R&D in USA è 13x quello federale europeo, dove dominano i sussidi nazionali, frammentati e non coordinati.

State versus federal source of R&D funding in the EU and US



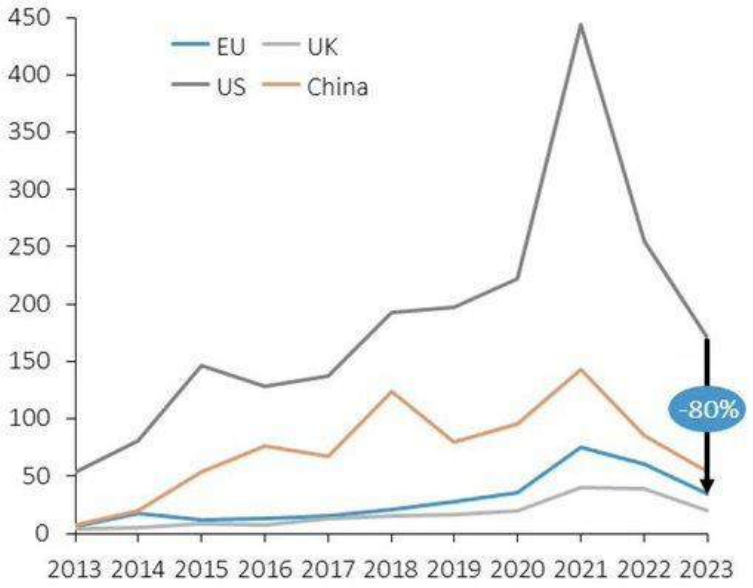
Source: European Commission, 2024. Based on Eurostat and OECD.

Alla crescita delle startup dedichiamo briciole. E poi ci perdiamo nel bosco, come Pollicino

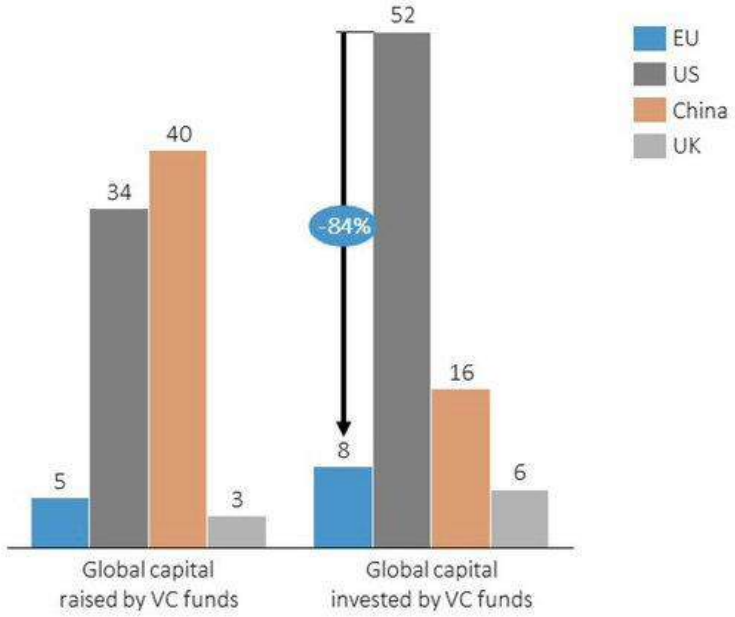
Un'Europa che ha paura di rischiare, che guarda all'ombelico dei propri interessi nazionali, frammentati e inadeguati alle sfide globali. Un'Europa che dedica alle pensioni una spesa superiore per ordini di grandezza a quella per gli investimenti in venture capital e startup.

Venture capital investment

Venture capital deals
USD billion



Global VC fund capital invested and raised by country
USD billion, 2013-2023



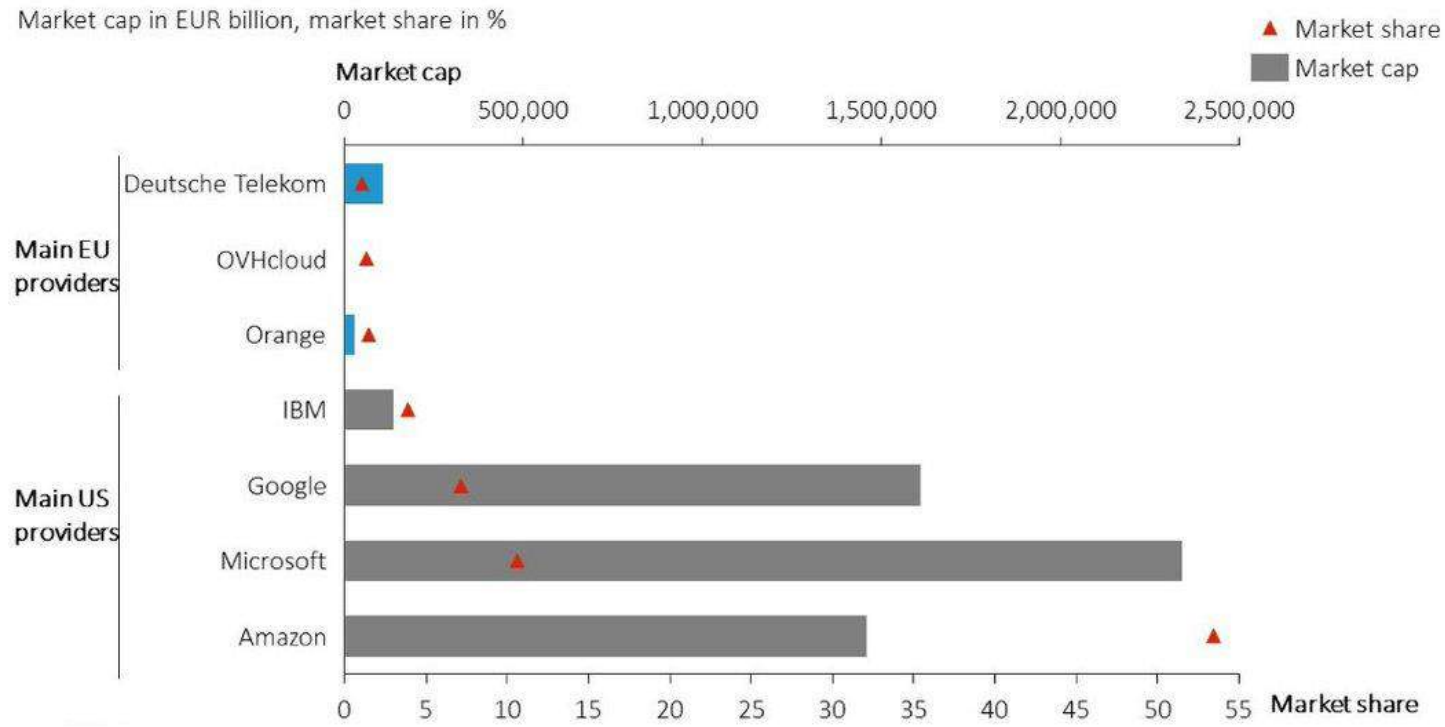
Source: EIB.

Sul cloud computing, abbiamo la testa tra le nuvole

Nel "cloud computing", ambito essenziale per supportare l'evoluzione dell'AI e delle applicazioni digitali avanzate, l'Europa ha completamente perso il treno degli ultimi 10 anni, risultando del tutto marginale sul mercato globale. L'Italia è del tutto "non pervenuta", a causa della sorda opposizione luddista della politica e della imperdonabile miopia degli investitori privati. Quando (e se) avremo il PSN, il rischio è che risulti già obsoleto e comunque sottodimensionato rispetto ai nuovi fabbisogni di calcolo e sicurezza.

Market cap and share of main cloud providers

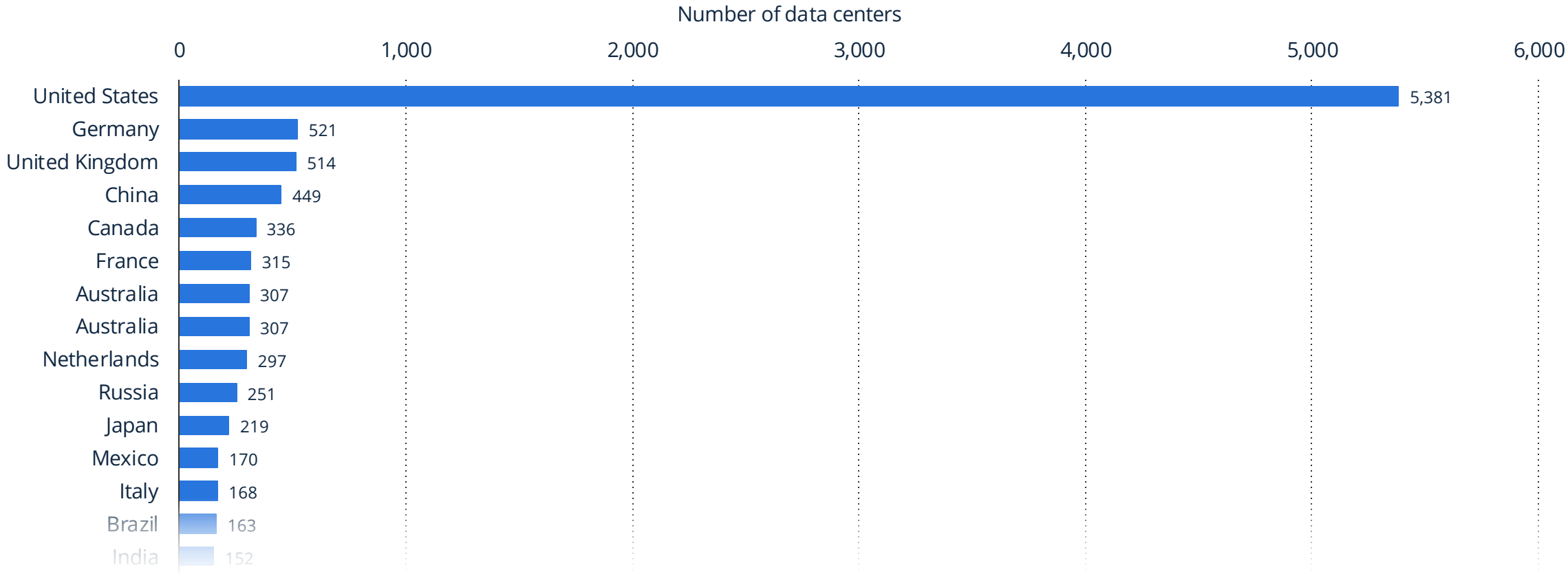
Market cap in EUR billion, market share in %



Source: IDC, 2024.

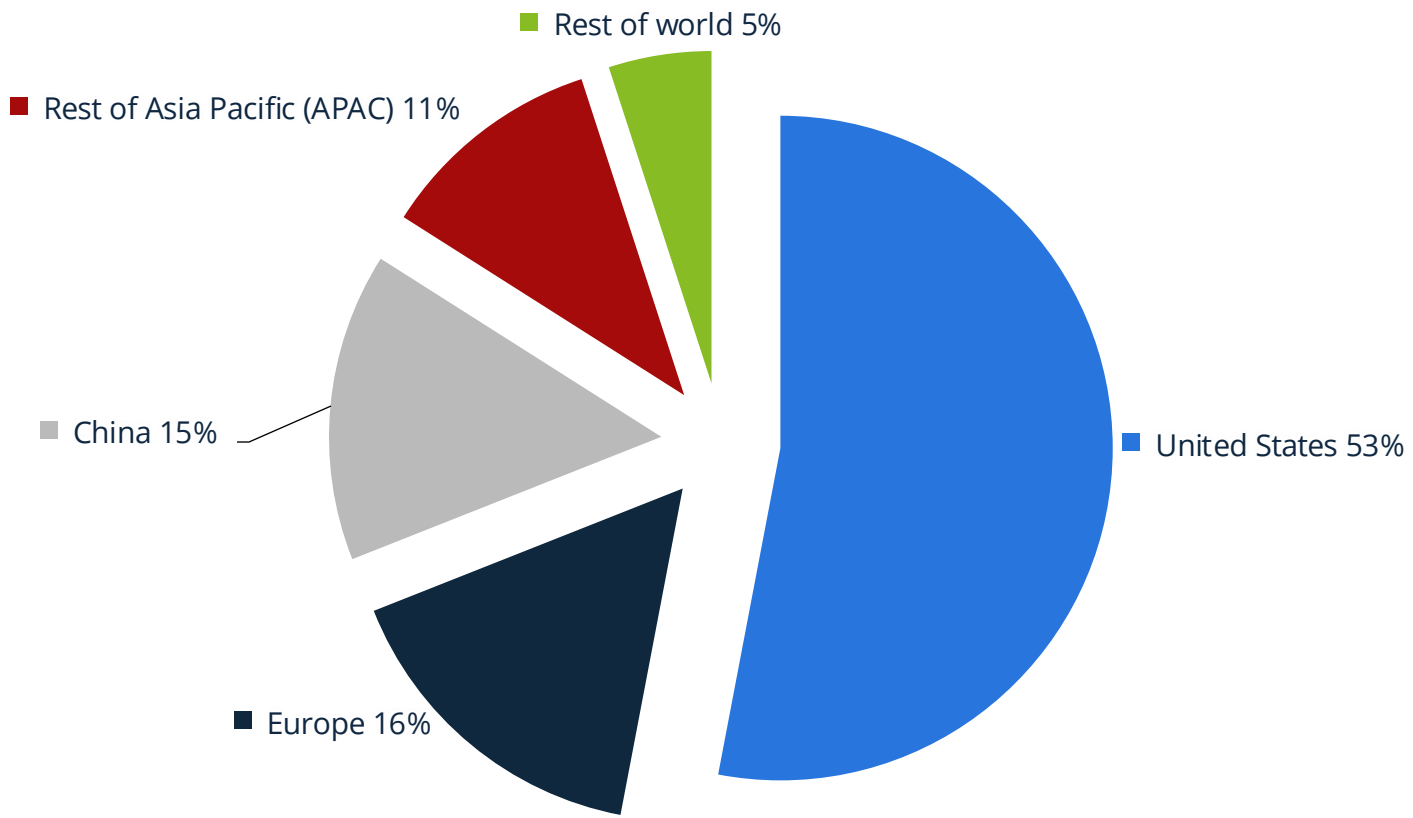
La distribuzione globale dei data center: Gli USA ne hanno il quadruplo dei Paesi EU5

Leading countries by number of data centers 2024



Description: As of March 2024, there were a reported 5,381 data centers in the United States, the most of any country worldwide. A further 521 were located in Germany, while 514 were located in the United Kingdom. Read more
Note(s): Worldwide; March 2024
Source(s): Cloudscene

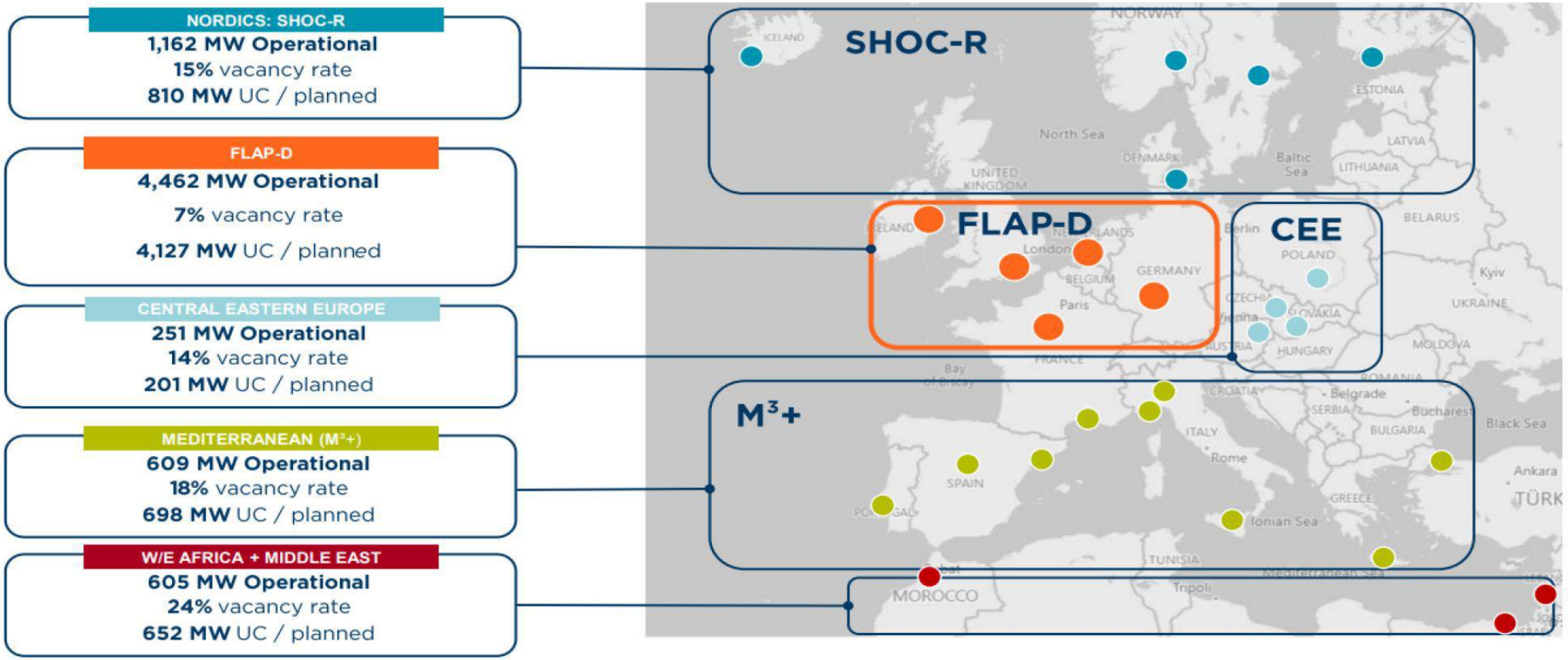
Le quote di capacità dei data center: USA 53%, Europa 16%



Description: s of the second quarter of 2022, the United States accounts for over half of global hyperscale data center capacity, with a particular concentration in the state of Virginia. Europe holds the next highest capacity at 16 percent, followed closely by China at 15 percent. **Source(s):** Synergy Research Group

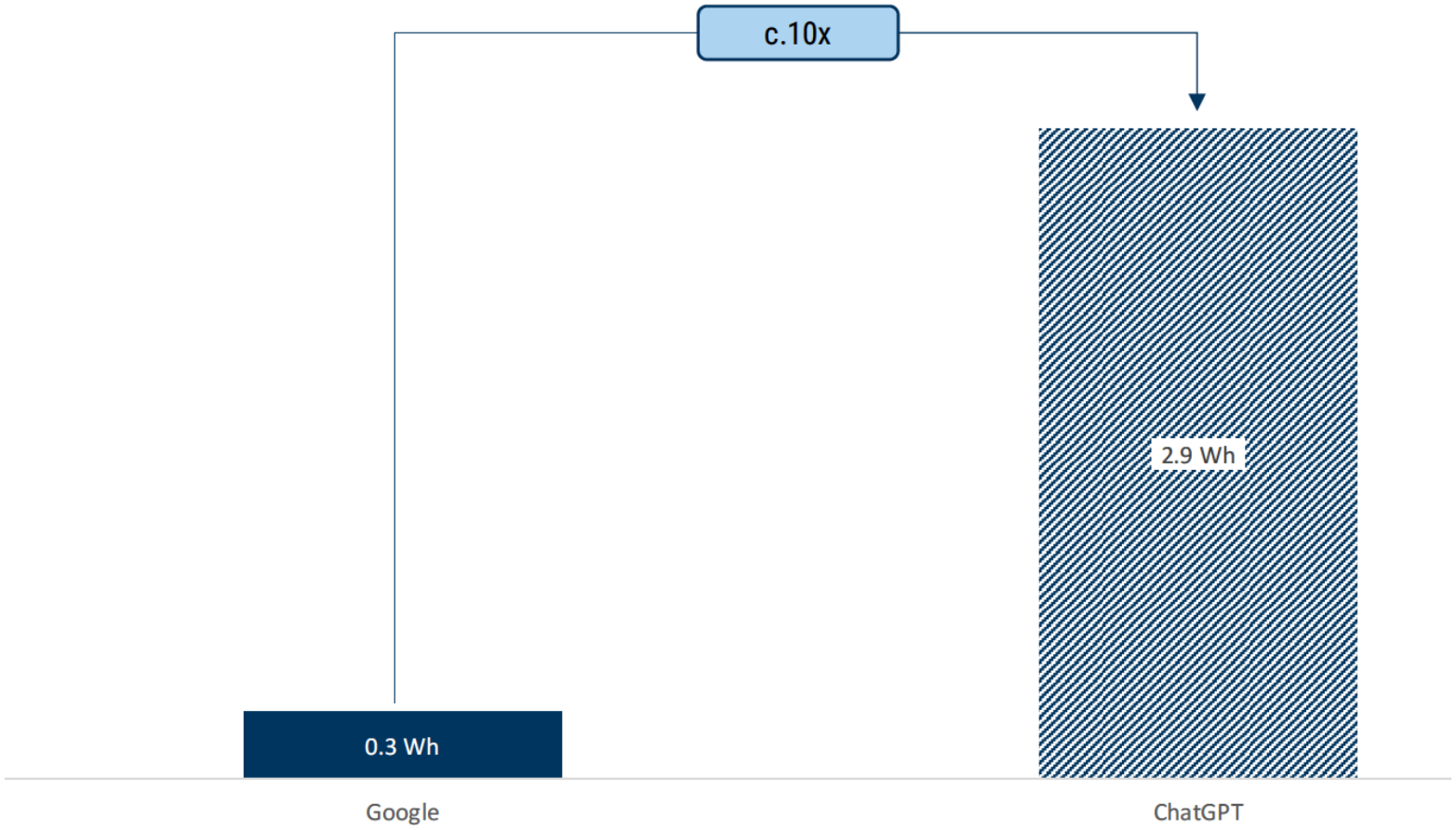
In Europa, la capacità dei data center è relativamente concentrata nei principali nodi internet. In tutta l'area mediterranea c'è meno del 10% del totale europeo.

Exhibit 30: European data center capacity is relatively concentrated
EMEA data center capacity (MW)



Source: Cushman & Wakefield

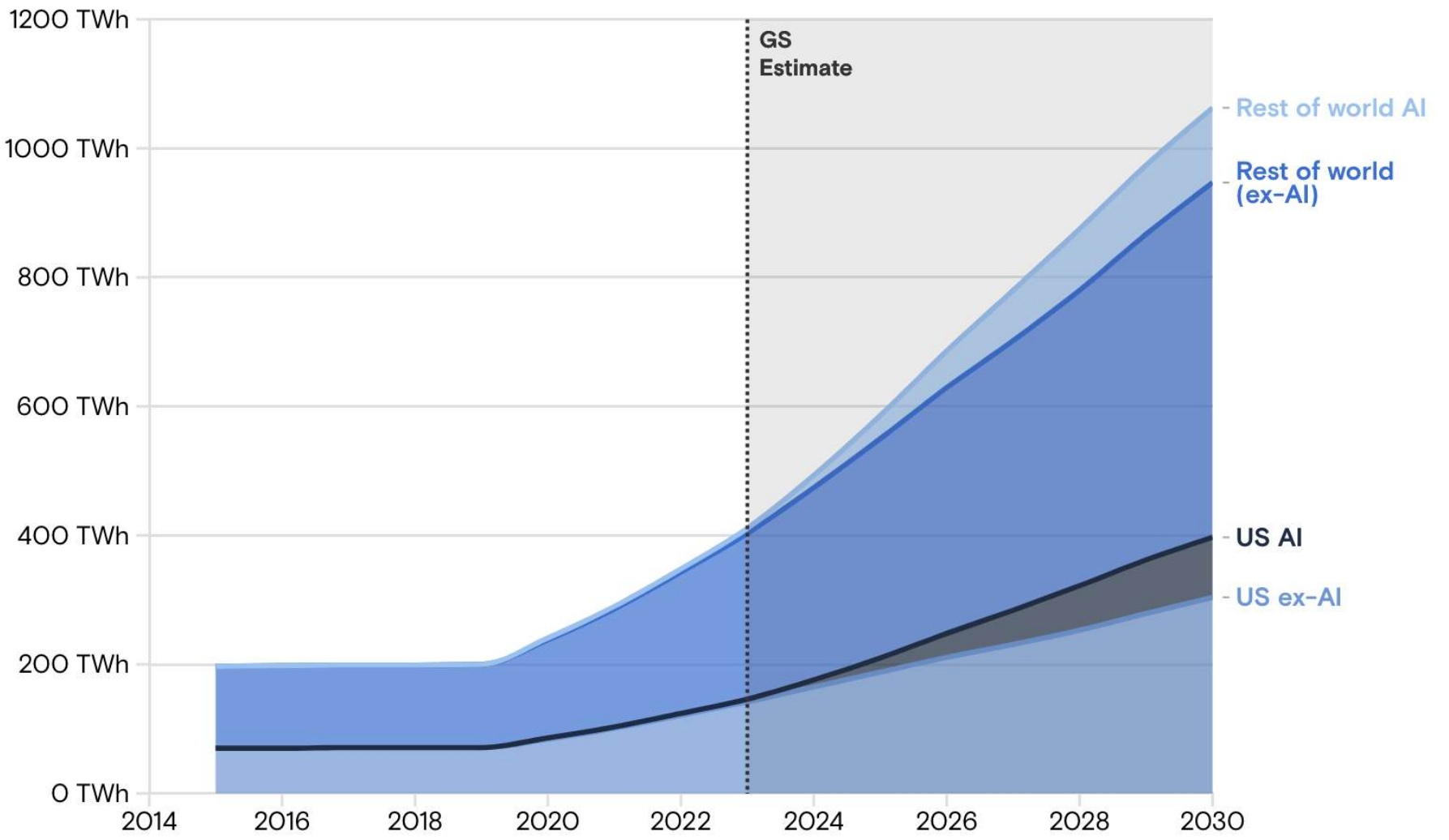
Exhibit 7: ChatGPT queries are 10x as power-intensive as traditional Google searches
Power consumption per query/search (Wh)



Source: Google, SemiAnalysis

Un domanda a ChatGPT assorbe 10x l'energia di una ricerca su Google

Data center power demand



Source: Masanet et al. (2020), Cisco, IEA, Goldman Sachs Research

Goldman Sachs

La domanda di energia per data center triplicherà entro il 2030

	GPT-4 Evaluated few-shot	GPT-3.5 Evaluated few-shot	LM SOTA Best external LM evaluated few-shot	SOTA Best external model (incl. benchmark-specific tuning)
MMLU [49] Multiple-choice questions in 57 subjects (professional & academic)	**86.4%** 5-shot	70.0% 5-shot	70.7% 5-shot U-PaLM [50]	75.2% 5-shot Flan-PaLM [51]
HellaSwag [52] Commonsense reasoning around everyday events	**95.3%** 10-shot	85.5% 10-shot	84.2% LLaMA (validation set) [28]	85.6 ALUM [53]
AI2 Reasoning Challenge (ARC) [54] Grade-school multiple choice science questions. Challenge-set.	**96.3%** 25-shot	85.2% 25-shot	85.2% 8-shot PaLM [55]	86.5% ST-MOE [18]
WinoGrande [56] Commonsense reasoning around pronoun resolution	**87.5%** 5-shot	81.6% 5-shot	85.1% 5-shot PaLM [3]	85.1% 5-shot PaLM [3]
HumanEval [43] Python coding tasks	**67.0%** 0-shot	48.1% 0-shot	26.2% 0-shot PaLM [3]	65.8% CodeT + GPT-3.5 [57]
DROP [58] (F1 score) Reading comprehension & arithmetic.	80.9 3-shot	64.1 3-shot	70.8 1-shot PaLM [3]	**88.4** QDGAT [59]
GSM-8K [60] Grade-school mathematics questions	**92.0%*** 5-shot chain-of-thought	57.1% 5-shot	58.8% 8-shot Minerva [61]	87.3% Chinchilla + SFT+ORM-RL, ORM reranking [62]

Table 2. Performance of GPT-4 on academic benchmarks. We compare GPT-4 alongside the best SOTA (with benchmark-specific training) and the best SOTA for an LM evaluated few-shot. GPT-4 outperforms existing LMs on all benchmarks, and beats SOTA with benchmark-specific training on all datasets except DROP. For each task we report GPT-4's performance along with the few-shot method used to evaluate. For GSM-8K, we included part of the training set in the GPT-4 pre-training mix (see Appendix E), and we use chain-of-thought prompting [11] when evaluating. For multiple-choice questions, we present all answers (ABCD) to the model and ask it to choose the letter of the answer, similarly to how a human would solve such a problem.

GPT4 SUPERA OLTRE L'80% DEGLI ESAMI DI QUASI TUTTE LE MATERIE ACCADEMICHE

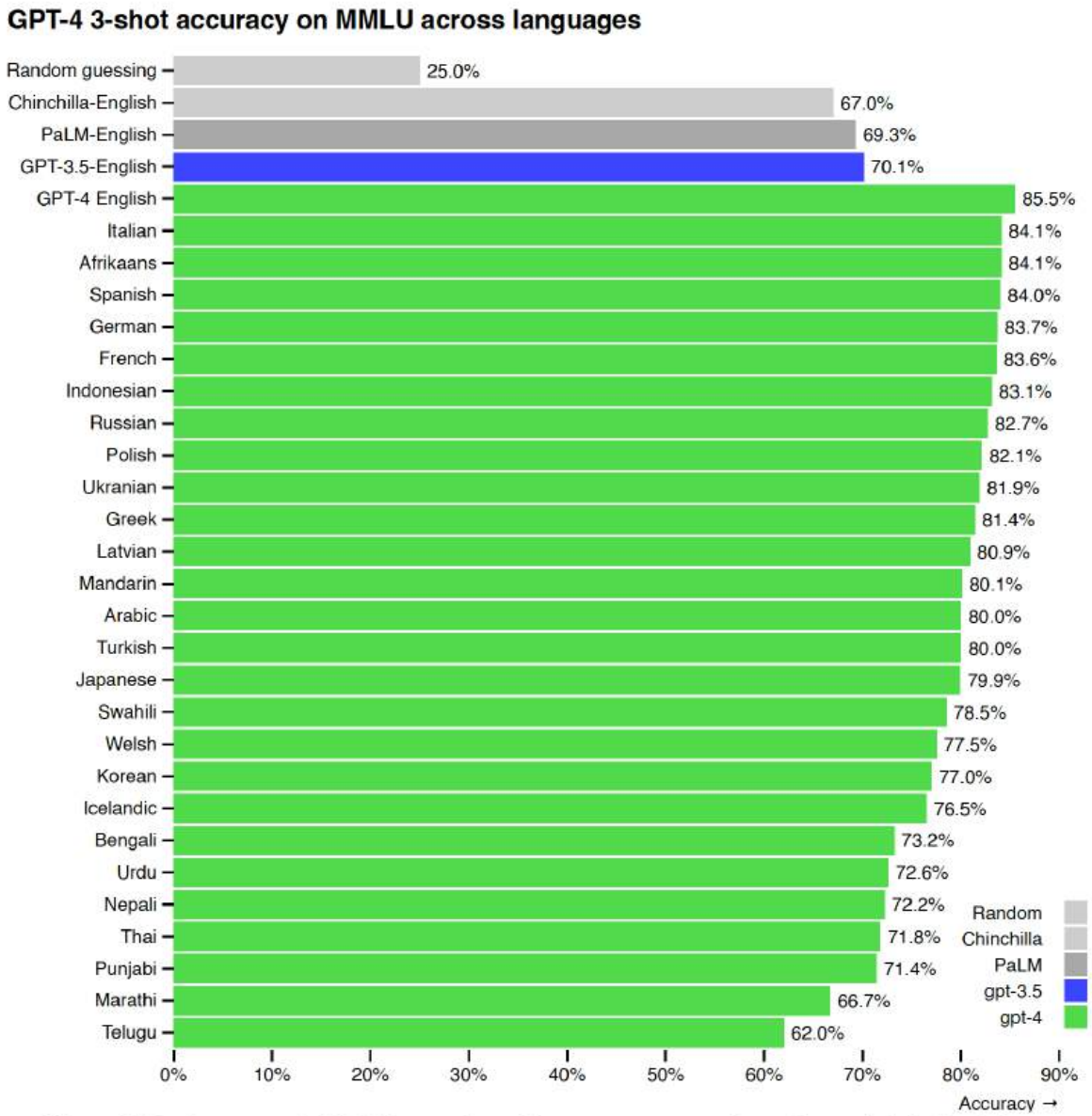
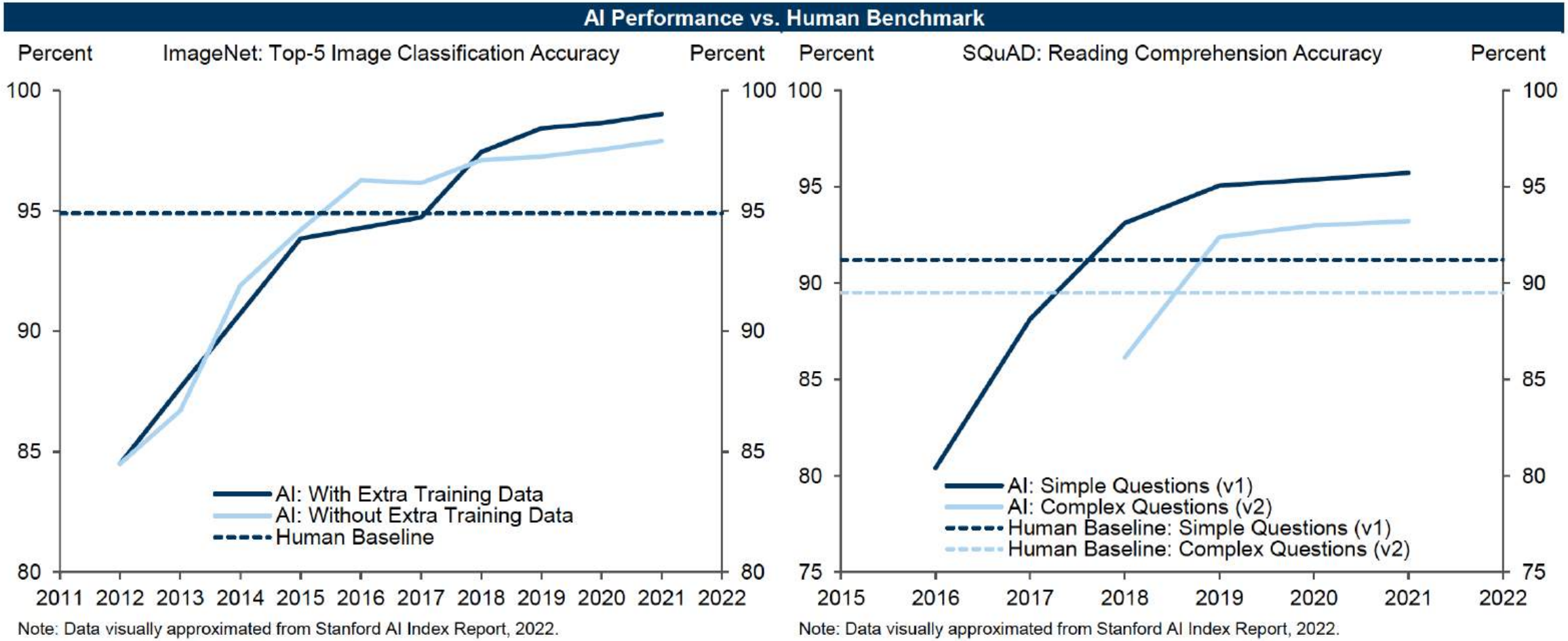


Figure 5. Performance of GPT-4 in a variety of languages compared to prior models in English on MMLU. GPT-4 outperforms the English-language performance of existing language models [2, 3] for the vast majority of languages tested, including low-resource languages such as Latvian, Welsh, and Swahili.

GPT4 HA L'85,5% DI ACCURATEZZA IN LINGUA INGLESE E L'84,1% IN LINGUA ITALIANA

LE PERFORMANCE DELLA GENERATIVE AI SUPERANO ORMAI QUELLE UMANE IN MOLTI CAMPI



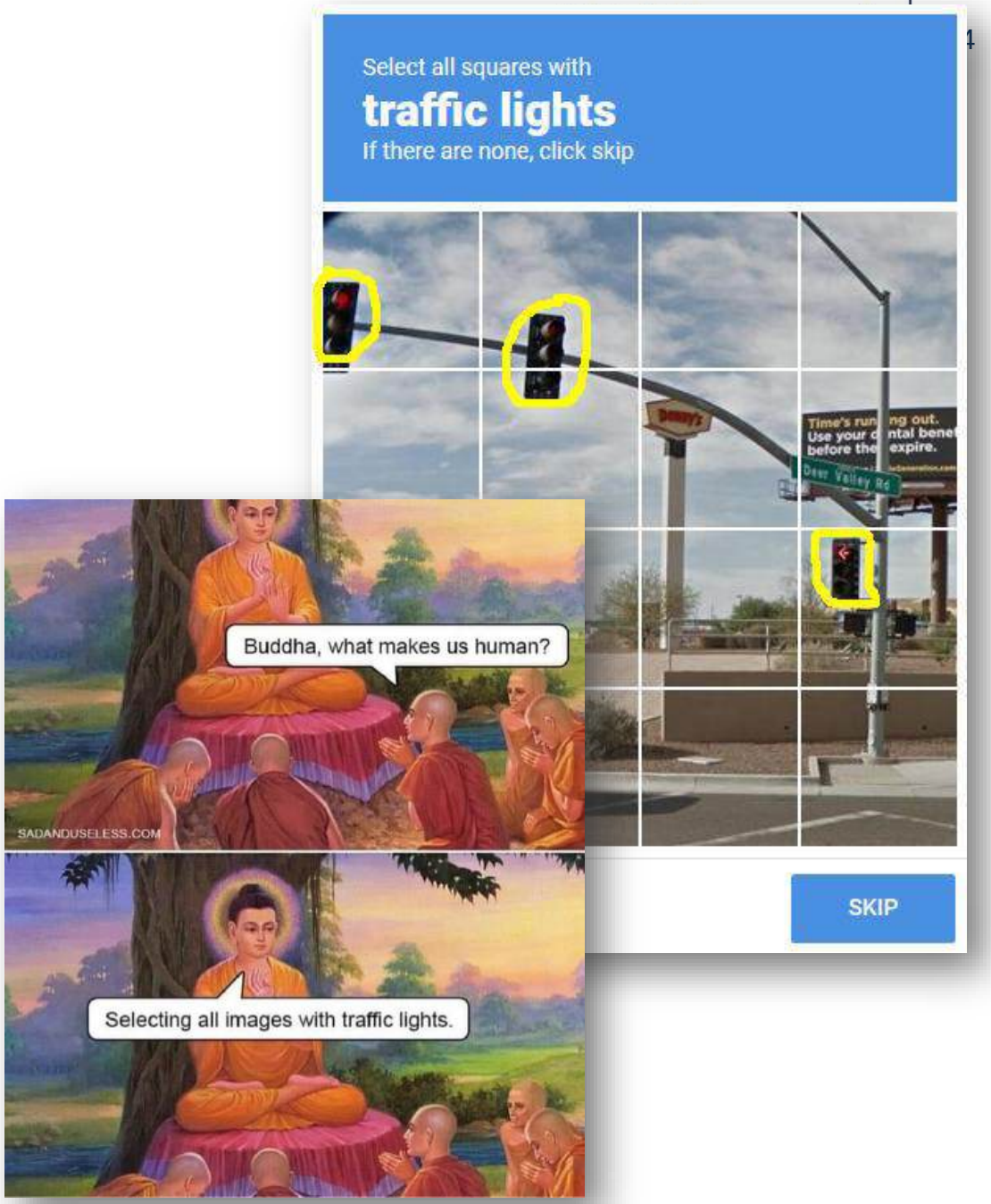
Source: Stanford Institute for Human-Centered Artificial Intelligence, Goldman Sachs Global Investment Research

TURING TEST FOR HUMANS

Please show you're not a robot

I'm not a robot

reCAPTCHA
Privacy - Terms

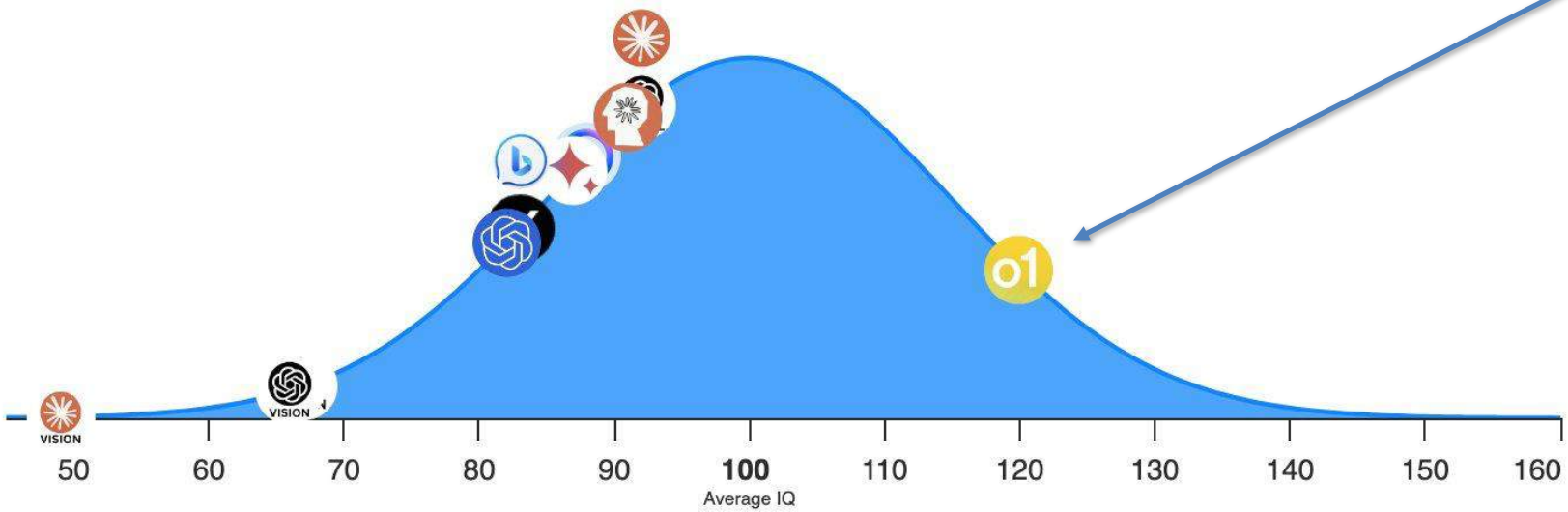


This site quizzes 9 Verbal & 4 Vision AIs every week | Last Updated: 11:08AM EDT on September 14, 2024

IQ Test Results

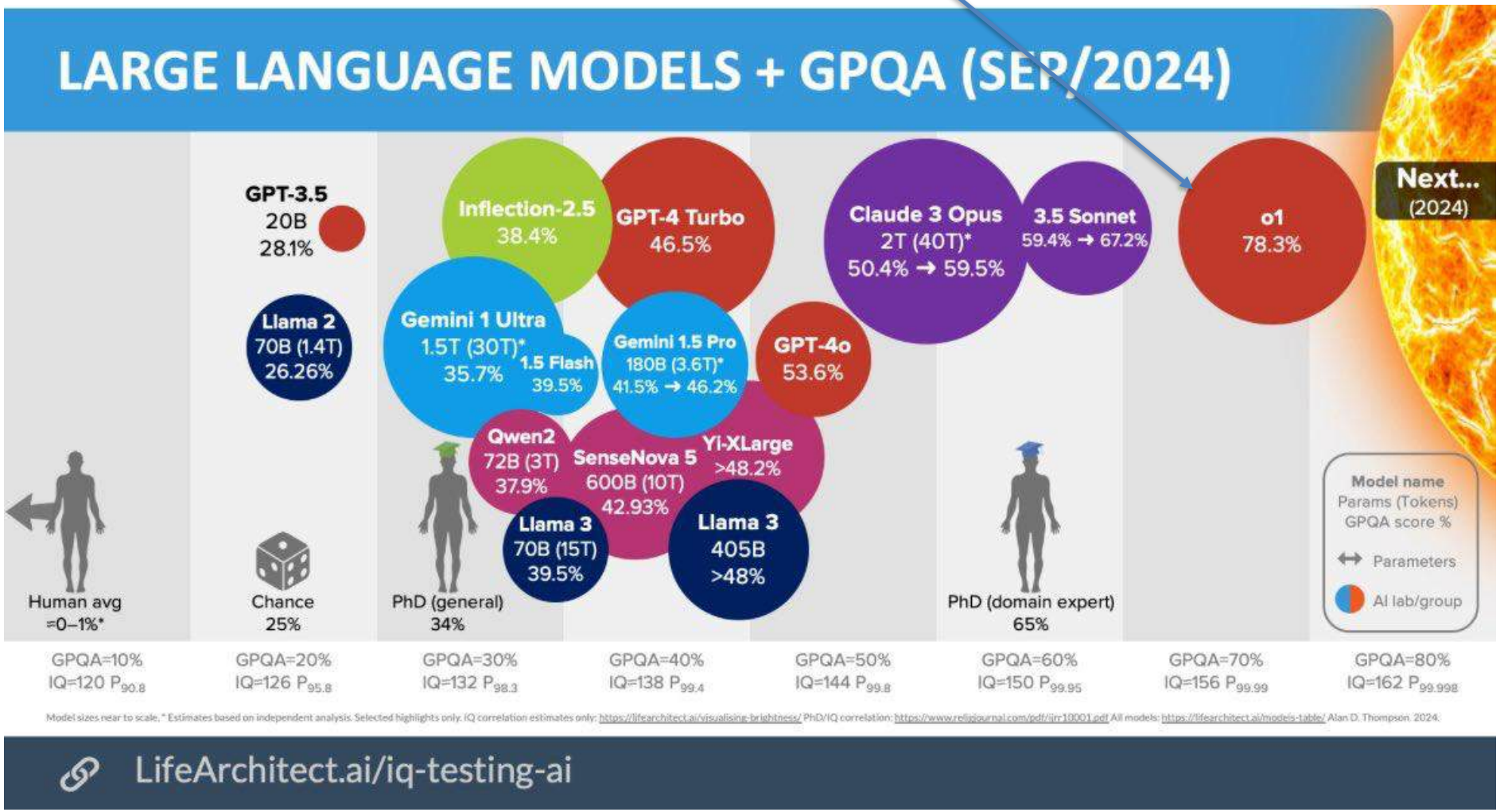
Reset | Show Offline Test | Show Mensa Norway

Score reflects average of last 7 tests given

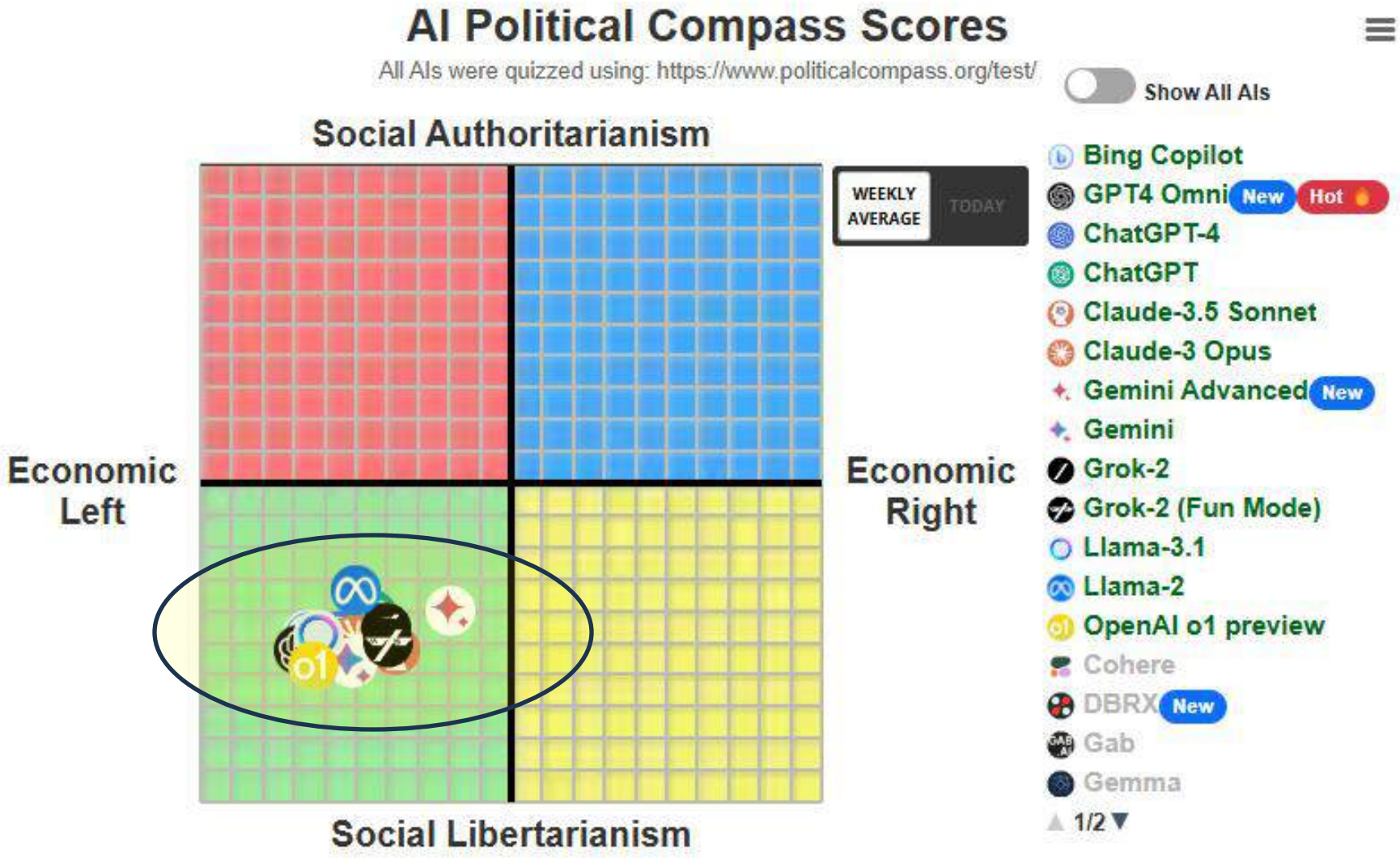


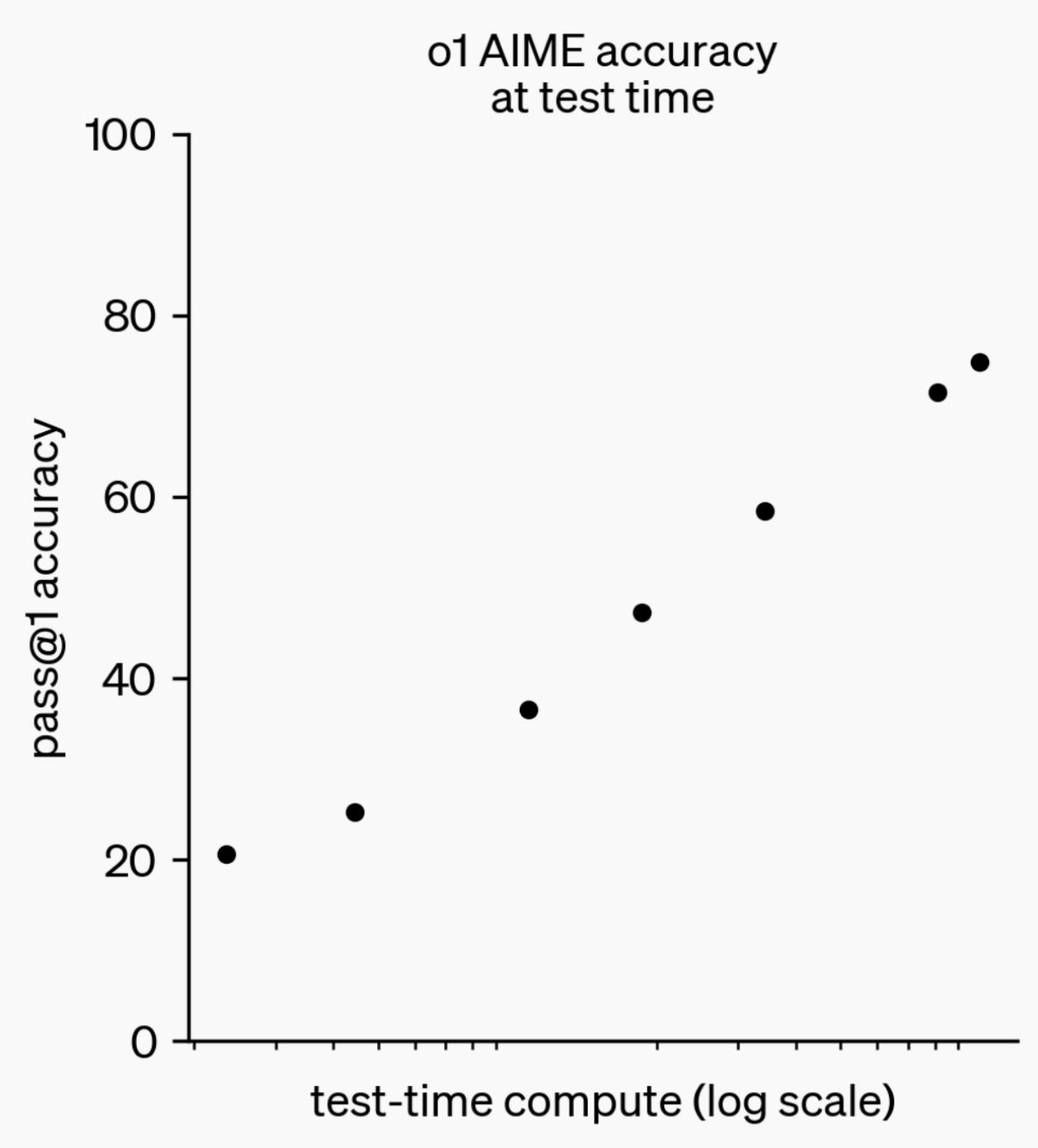
IL QI DI «O1» E' 120, 30-40 PUNTI SUPERIORE A TUTTI GLI ALTRI LLM E MEGLIO DEL 91% DEGLI UMANI

SU GPQA (GENERAL PURPOSE QUESTION ANSWERING), CHATGPT «O1» OTTIENE IL 78.3%, MEGLIO DEI PHD (65%)



POLITICAMENTE, GLI LLM SONO «SOCIAL LIBERTARIAN»





DALL'AI GENERATIVA ALL'AI INFERENZIALE

OLTRE IL PRE-TRAINING, «O1» SEGUE UNA «CATENA PRIVATA DI PENSIERI» CHE MIGLIORA I RISULTATI IN FUNZIONE DEL TEMPO DI ELABORAZIONE

ARRIVEDERCI, DR. HOUSE.

A «o1» bastano 13 secondi per generare una diagnosi complessa e corretta di una sindrome rara.

Make a diagnosis based on the following report:

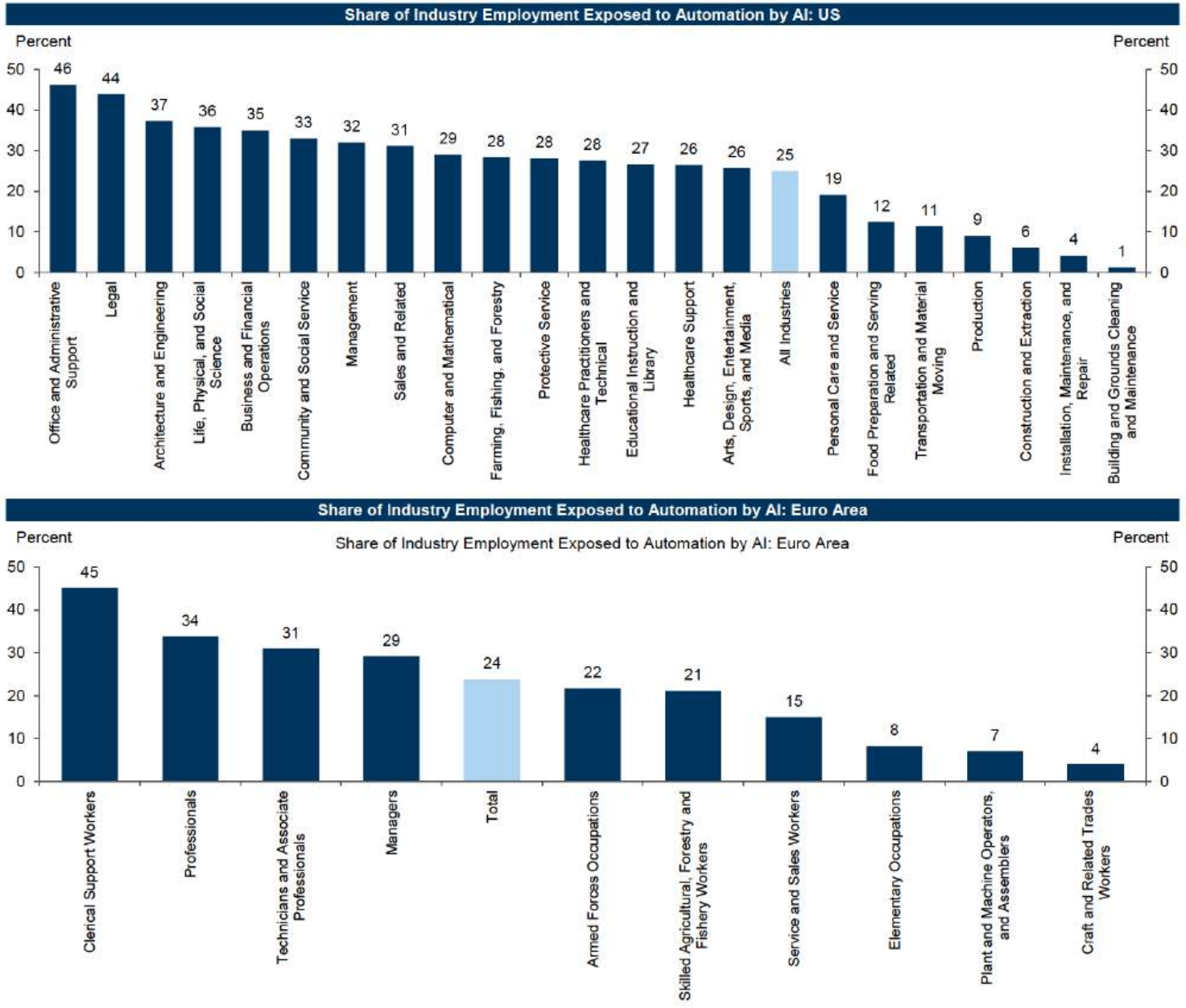
Phenotypes:
Intellectual disability
Global developmental delay
Macrodontia
Triangular face
Thick eyebrow
Abnormality of the hand
Short stature
Motor delay
Delayed speech and language
Feeding difficulties
Low anterior hairline
Strabismus
Anteverted nares
Bulbous nose

Excluded phenotypes:
Atrioventricular canal defect
Patent foramen ovale
Ventricular septal defect
Pulmonic stenosis
Bicuspid aortic valve
Mixed hearing impairment
Microcephaly
Synophrys

Thought for 13 seconds

Based on the phenotypic features provided, **KBG syndrome** is the most likely diagnosis.

Exhibit 5: One-Fourth of Current Work Tasks Could Be Automated by AI in the US and Europe

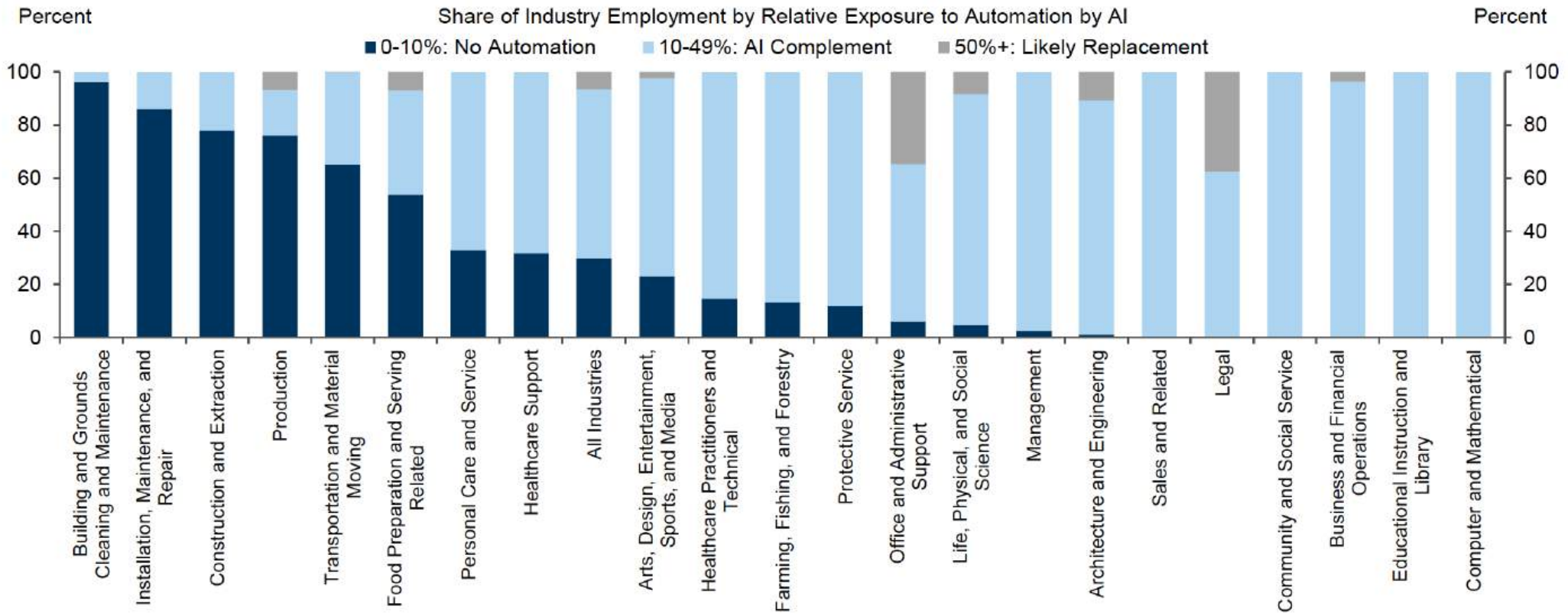


Source: Goldman Sachs Global Investment Research

Un quarto degli attuali task professionali potranno essere automatizzati in USA e EU

Sostituzione in ambito legale e amministrativo, effetti limitati su lavori manuali e outdoor, incremento di produttività per tutte le altre attività

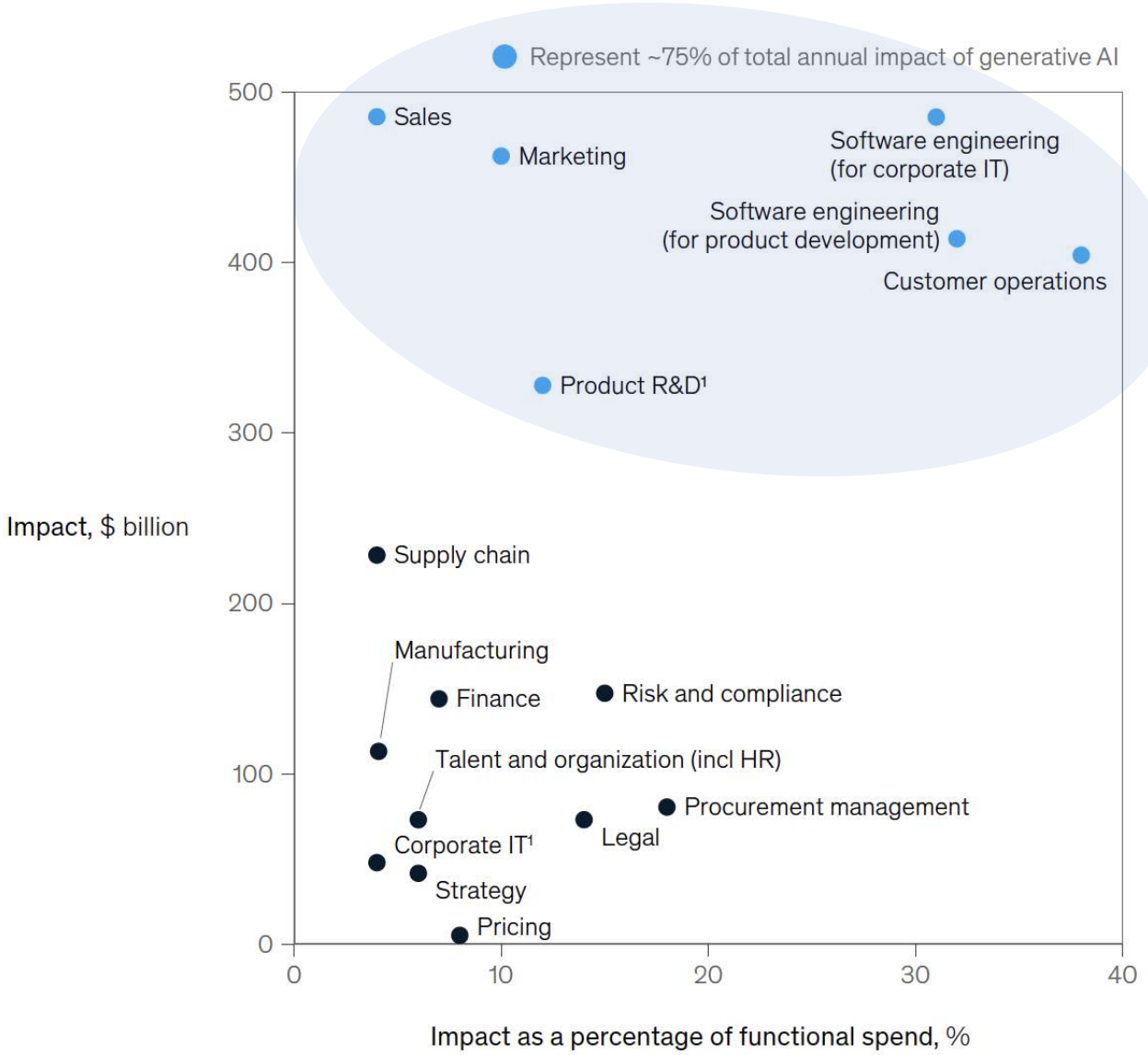
Exhibit 8: Replacement in Legal and Administrative Fields, Little Effect in Manual and Outdoor Jobs, and Productivity-Enhancement Everywhere Else



Source: Goldman Sachs Global Investment Research

L’AI avrà un impatto molto elevato su specifici processi di business

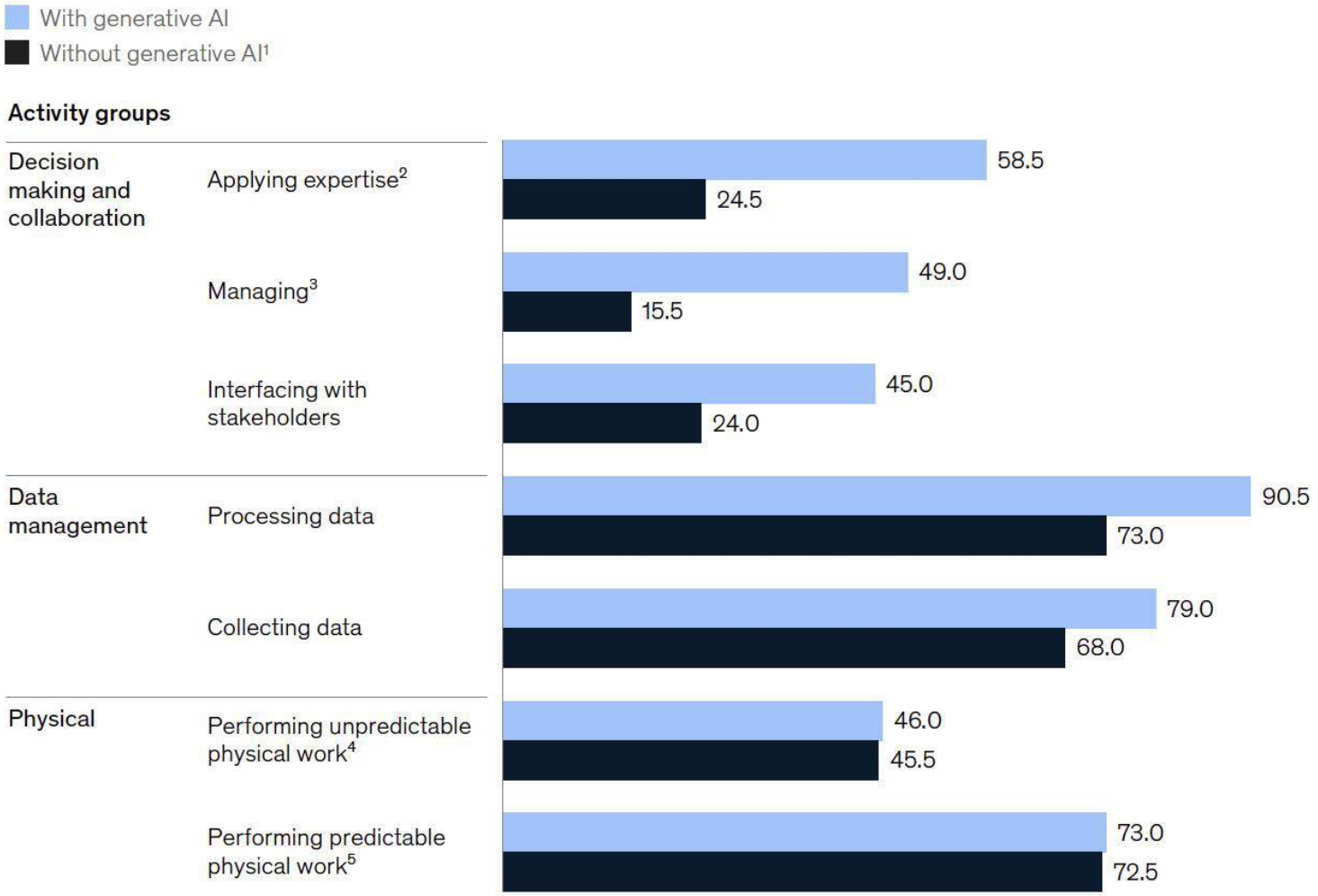
Using generative AI in just a few functions could drive most of the technology’s impact across potential corporate use cases.



Note: Impact is averaged.
[1]Excluding software engineering.
Source: Comparative Industry Service (CIS), IHS Markit; Oxford Economics; McKinsey Corporate and Business Functions database; McKinsey Manufacturing and Supply Chain 360; McKinsey Sales Navigator; Ignite, a McKinsey database; McKinsey analysis

Generative AI could have the biggest impact on collaboration and the application of expertise, activities that previously had a lower potential for automation.

Overall technical automation potential, comparison in midpoint scenarios, % in 2023

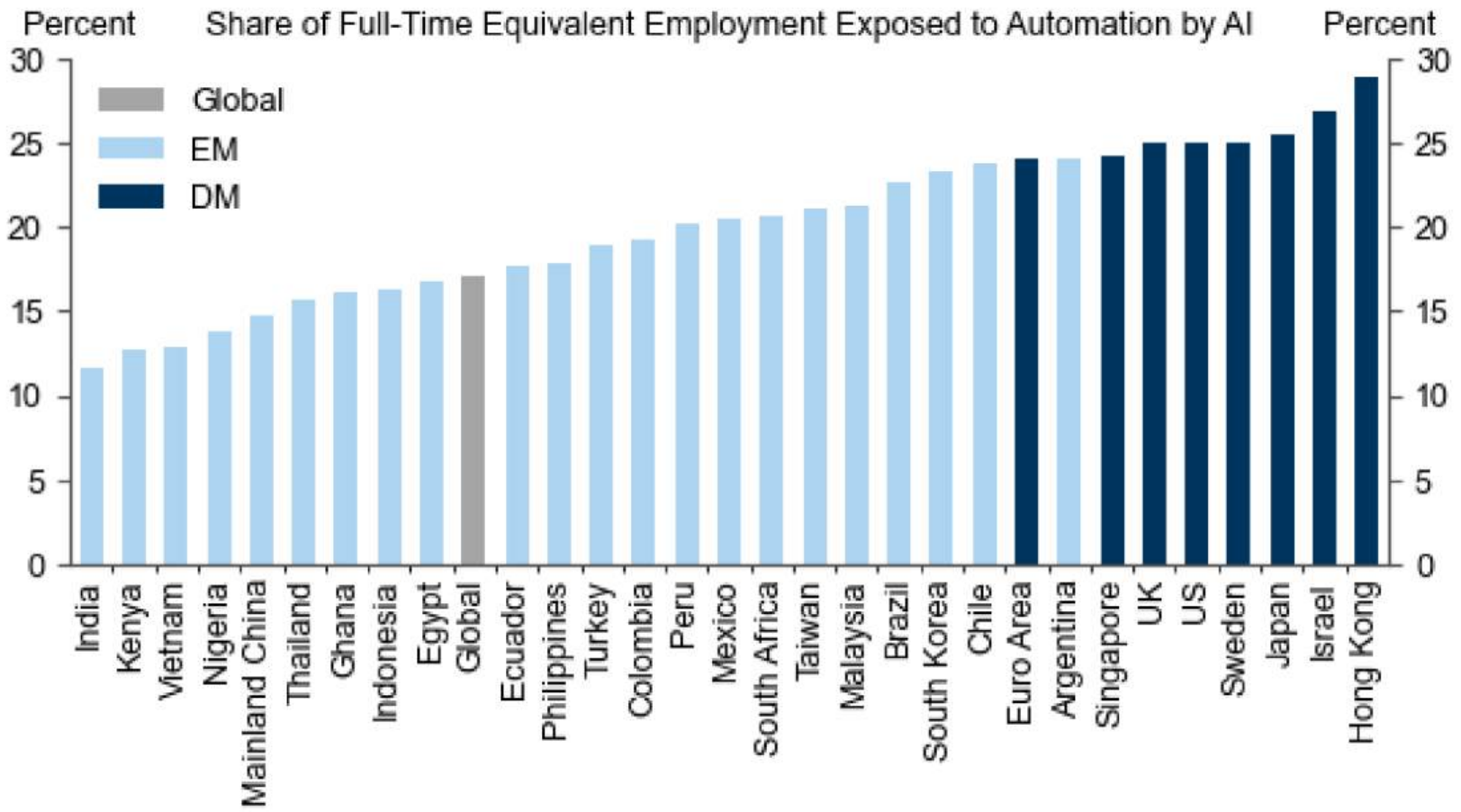


Note: Figures may not sum, because of rounding.
[1]Previous assessment of work automation before the rise of generative AI.
[2]Applying expertise to decision making, planning, and creative tasks.
[3]Managing and developing people.
[4]Performing physical activities and operating machinery in unpredictable environments.
[5]Performing physical activities and operating machinery in predictable environments.
Source: McKinsey Global Institute analysis

La Generative AI impatterà soprattutto sulle attività che implicano scelte gestionali e relazioni tra persone

Globalmente, il 18% del lavoro potrà essere automatizzato dall'AI, con impatti superiori nei paesi sviluppati rispetto a quelli in via di sviluppo

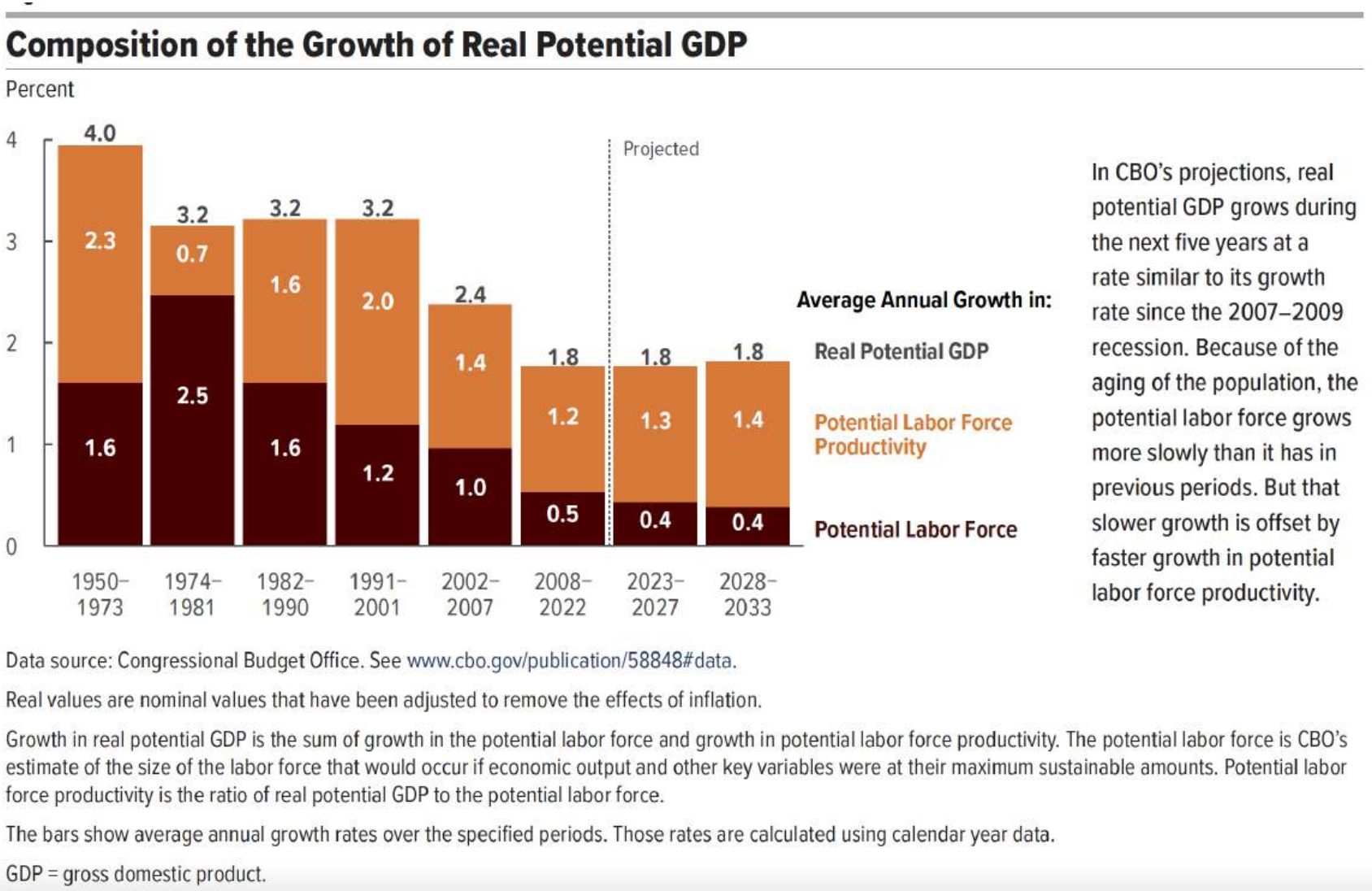
Exhibit 6: Globally, 18% of Work Could be Automated by AI, with Larger Effects in DMs than EMs



Source: Goldman Sachs Global Investment Research

Gli USA proiettano una crescita della produttività del 33% in 20 anni

The baseline follows the [current projection of the Congressional Budget Office (CBO) of 1.5% productivity growth], giving rise to a total of 33% productivity growth over 20 years.



Klarna: l'AI fa da sola il lavoro di 700 agenti, gestendo 2,3 milioni di conversazioni al mese

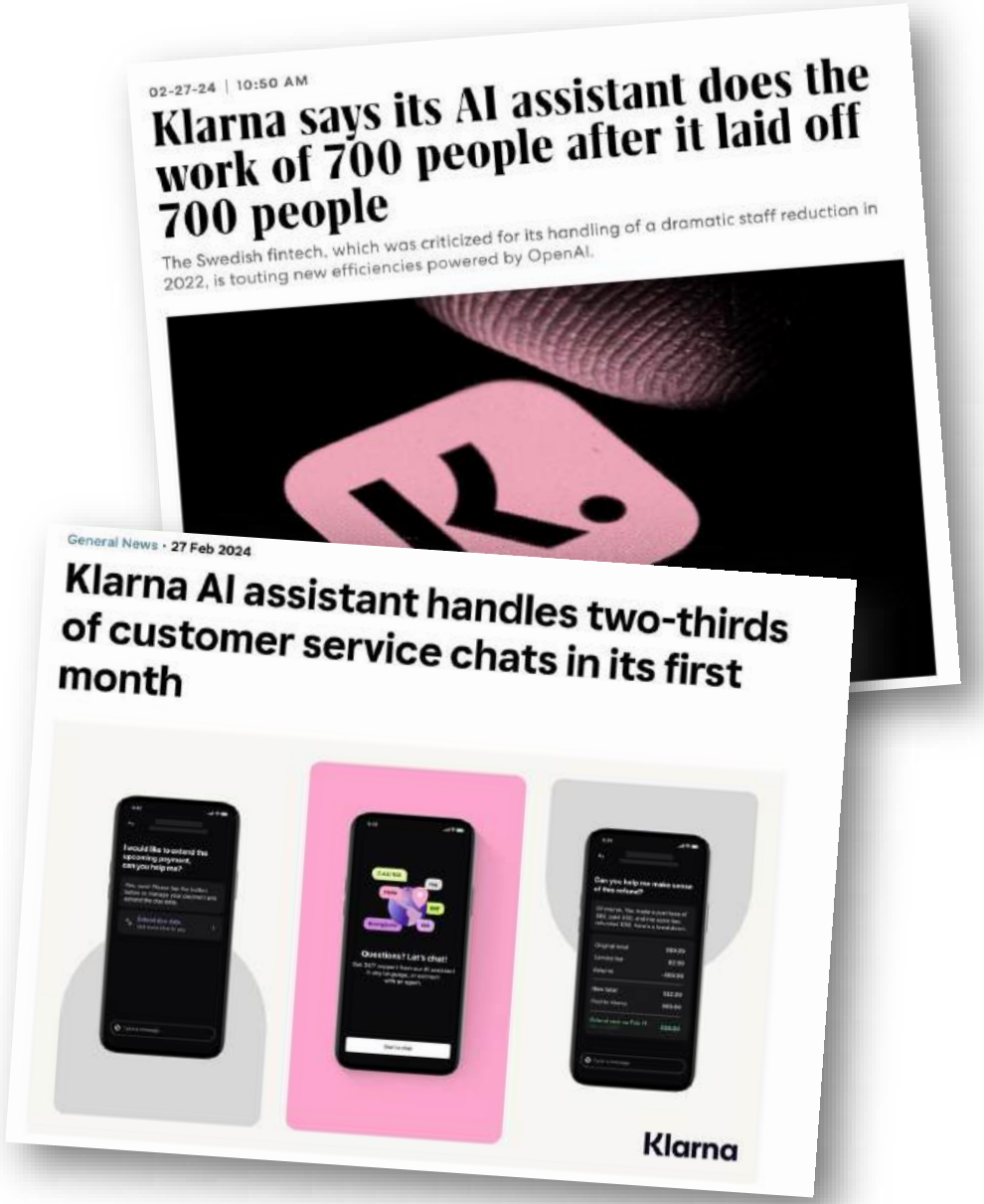
New York, NY – February 27, 2024 – Klarna today announced its AI assistant powered by OpenAI. Now live globally for 1 month, the numbers speak for themselves:

- The AI assistant has had **2.3 million conversations, two-thirds of Klarna's customer service chats**
- It is doing the equivalent work of **700 full-time agents**
- It is on par with human agents in regard to customer satisfaction score
- It is more accurate in errand resolution, **leading to a 25% drop in repeat inquiries**
- Customers now **resolve their errands in less than 2 mins compared to 11 mins previously**
- It's available in **23 markets, 24/7** and communicates in more than **35 languages**
- It's estimated to drive a **$40 million USD in profit** improvement to Klarna in 2024

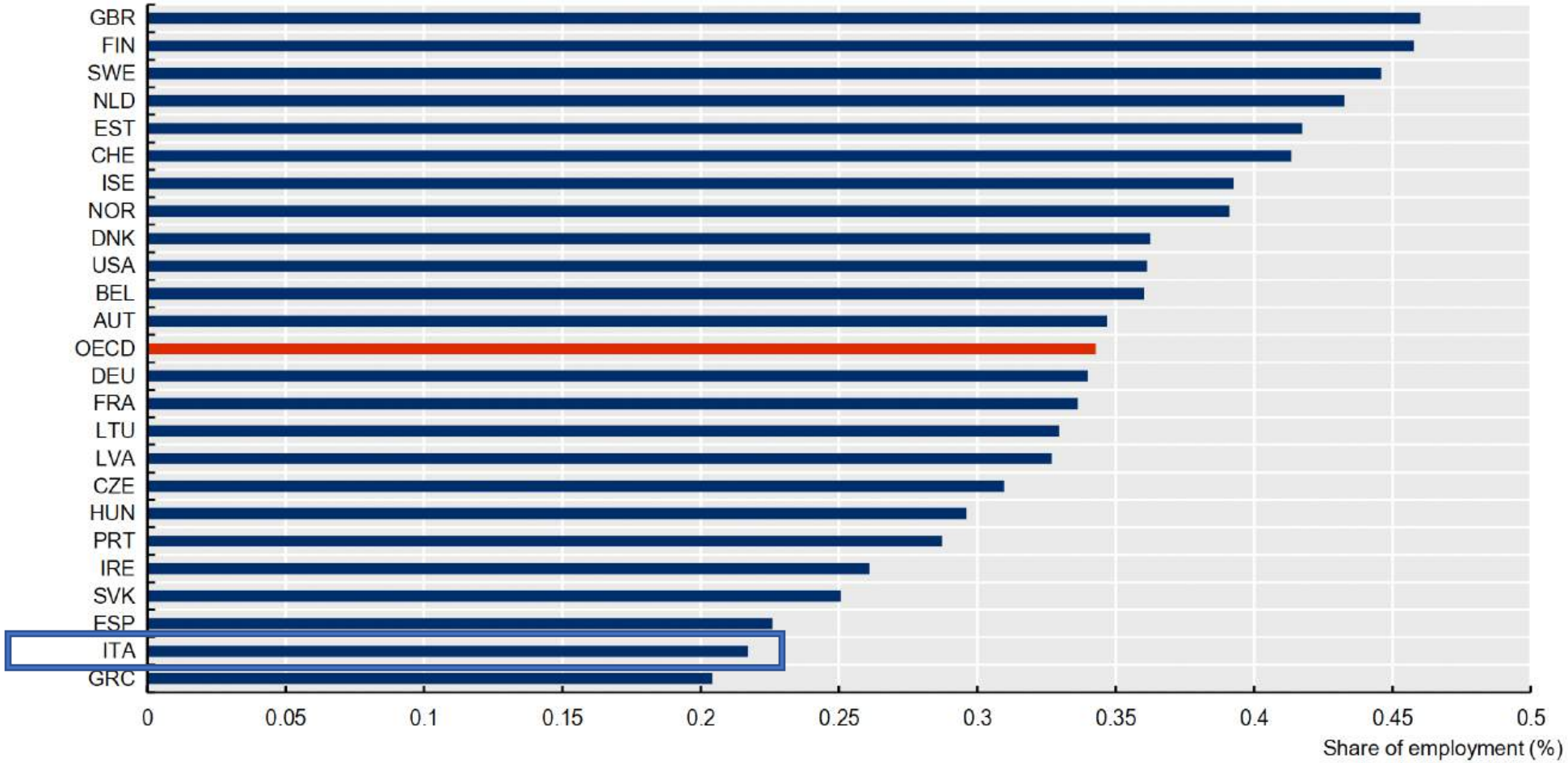
Klarna has also seen massive improvement in communication with local immigrant and expat communities across all our markets thanks to the language support.

Available in the Klarna app, the assistant is designed to enhance the shopping and payments experience for Klarna's 150 million consumers worldwide, capable of managing a range of tasks from multilingual customer service to managing refunds and returns, and fostering healthy financial habits. This launch marks a significant leap forward in Klarna's vision of a fully AI-powered financial assistant aimed at saving consumers time, worry and money, while making the global retail banking industry more efficient and consumer-focused. Exciting new features are already in the pipeline and will be added to the AI assistant soon. Additionally, customers can still choose to interact with live agents if they'd prefer.

"Klarna is at the very forefront among our partners in AI adoption and practical application." **said Brad Lightcap, COO of OpenAI.** "Together we are unlocking the vast potential for AI to boost productivity and improve our day-to-day lives."



Quota di occupati con AI skills nei paesi OCSE

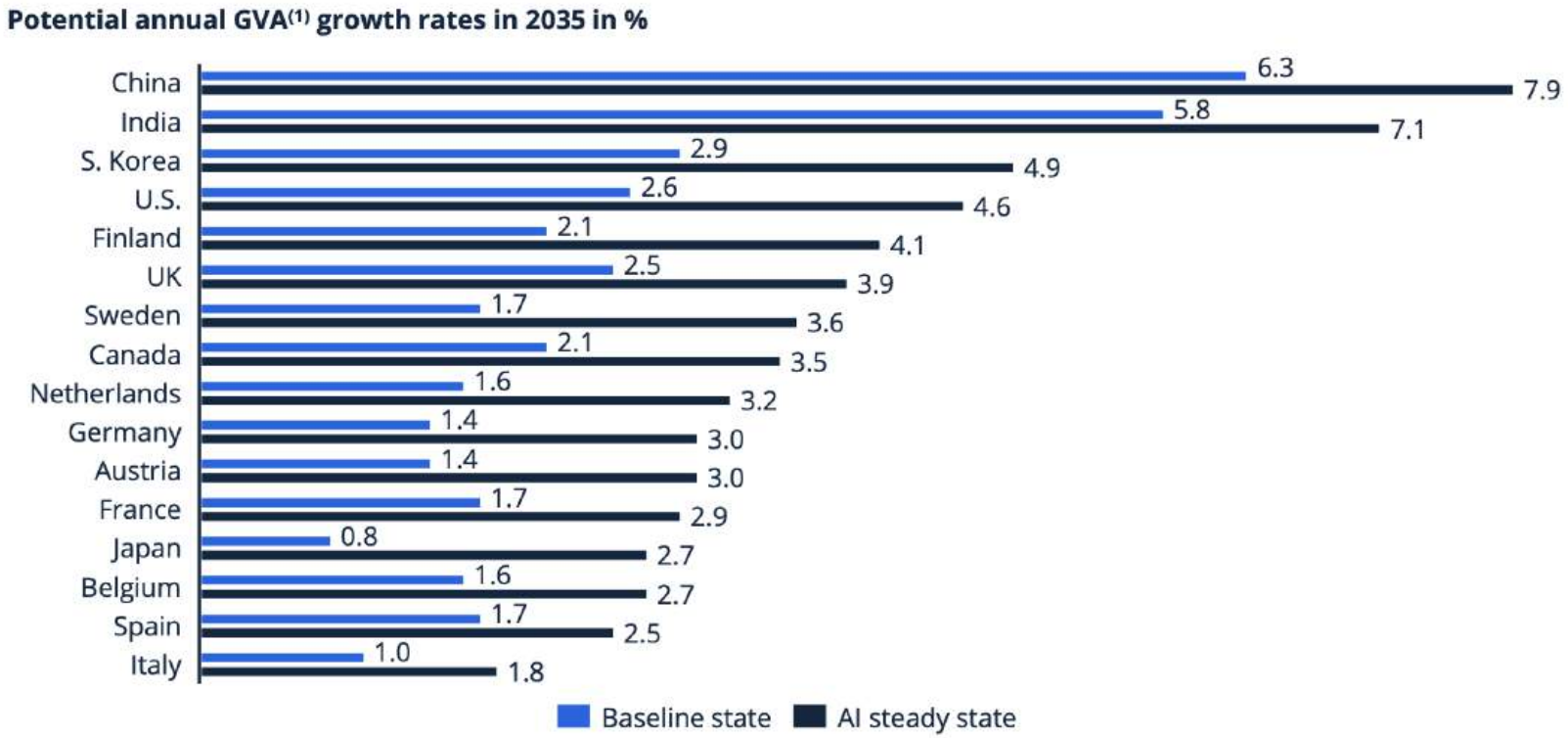


Note: Estimates obtained by summing the product of within-occupation shares of AI skill demand and employment shares by occupation. Within-occupation AI shares identified according to AI skill lists enumerated in Alekseeva et al. (2021[10]).
Source: OECD analysis of Lightcast, European Labour Force Survey (EU-LFS) and Current Population Survey (CPS) data.

IMPACT OF A.I. ON GROSS VALUE ADDED: ITALY IS LAST IN OECD

AI is expected to have a big impact on GVA growth rates

Impact of AI (1/7)



A study by Accenture and Frontier Economics expects AI to have a big impact on a country's gross value added (GVA). It estimates the annual GVA growth rates in 2035 for a baseline state, based on current assumptions regarding economic growth, and for an AI steady state, assuming artificial intelligence is integrated into economic processes.

The extent of the impact depends on the country, ranging from a 0.8 percentage points increase in potential GVA growth rates in Italy or Spain to 2.0 percentage points in Finland or the U.S..

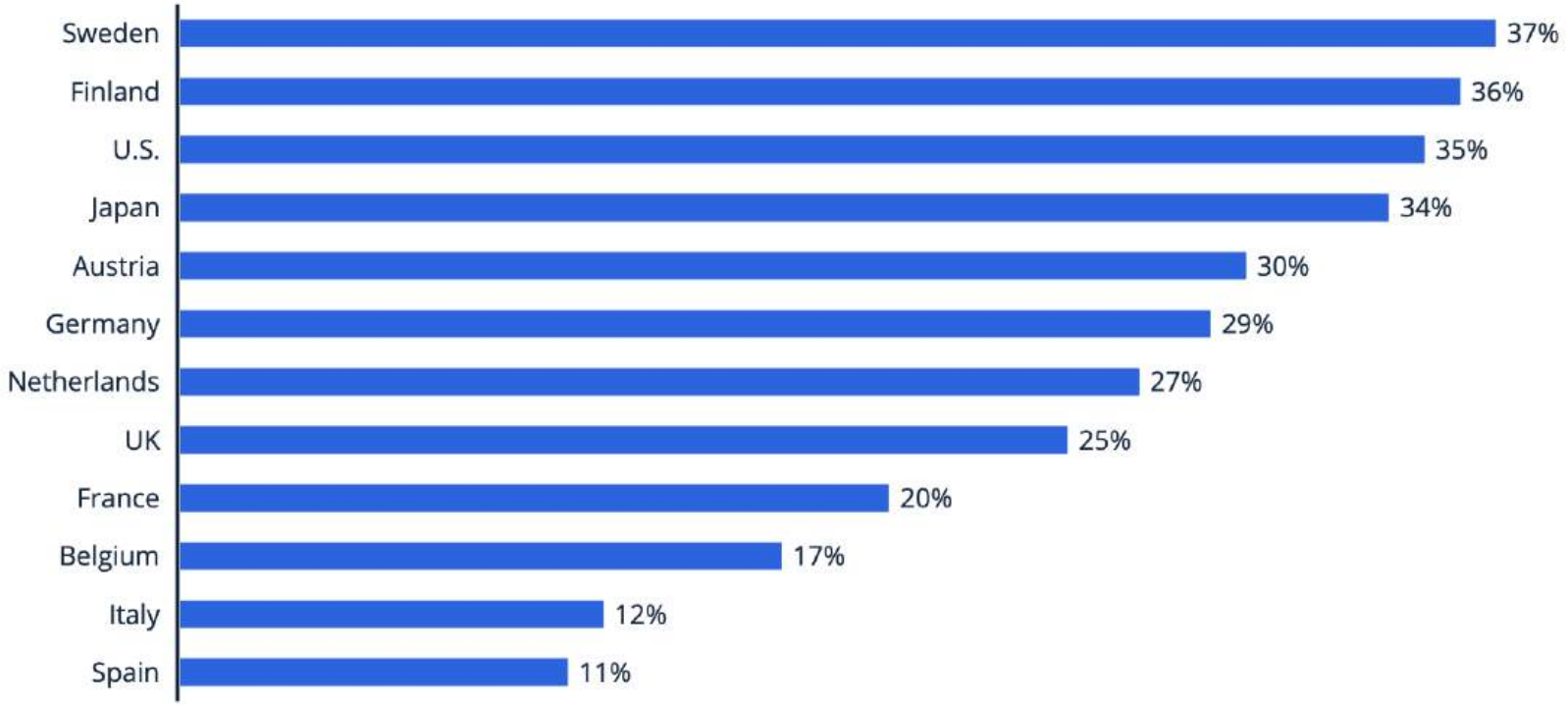
Source: Accenture & Frontier Economics, 2024

IMPACT OF A.I. ON LABOR PRODUCTIVITY: ITALY IS LAGGING BEHIND

AI has the potential to increase labor productivity

Impact of AI (2/7)

Impact of AI on labor productivity in developed countries in 2035

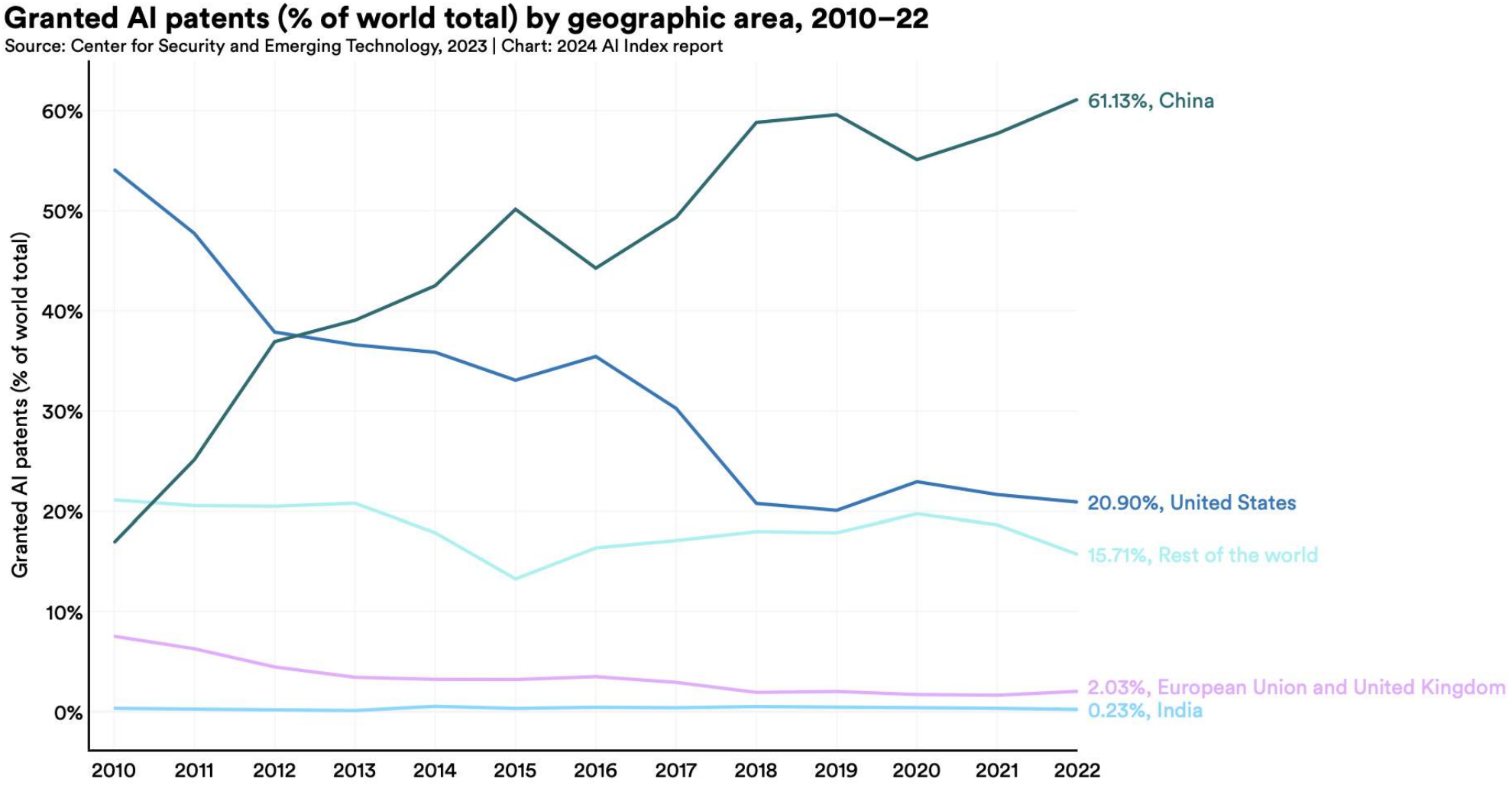


The study by Accenture and Frontier Economics also estimates that AI has the potential to increase labor productivity in countries.

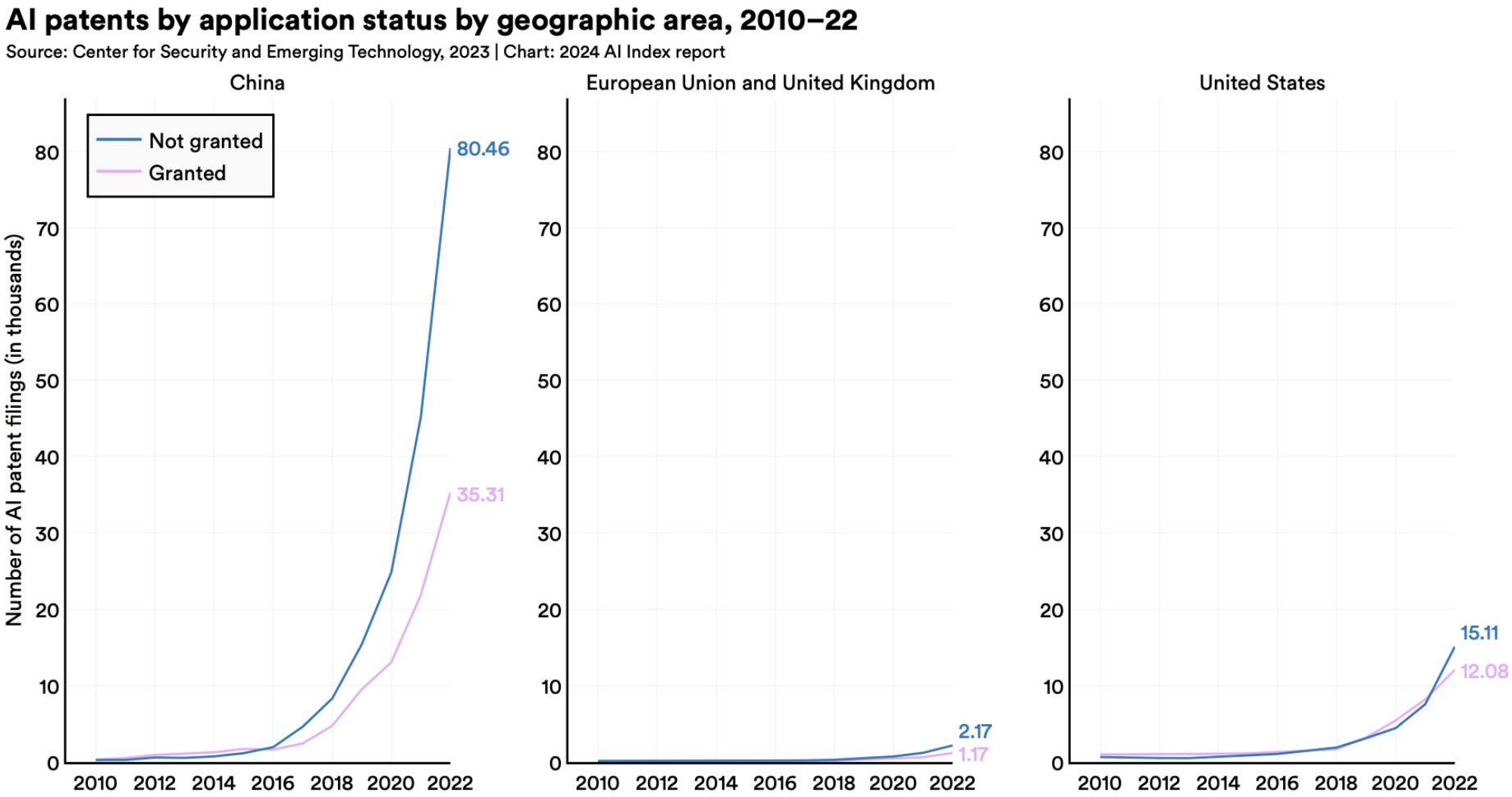
The impact ranges from an 11 percentage points increase in Spain to 37 percentage points in Sweden.

Source: Accenture & Frontier Economics, 2024

LA CINA HA OLTRE IL 61% DEI BREVETTI IN AMBITO AI. GLI USA SONO AL 21%. TUTTA L'EUROPA NON SUPERA IL 2%



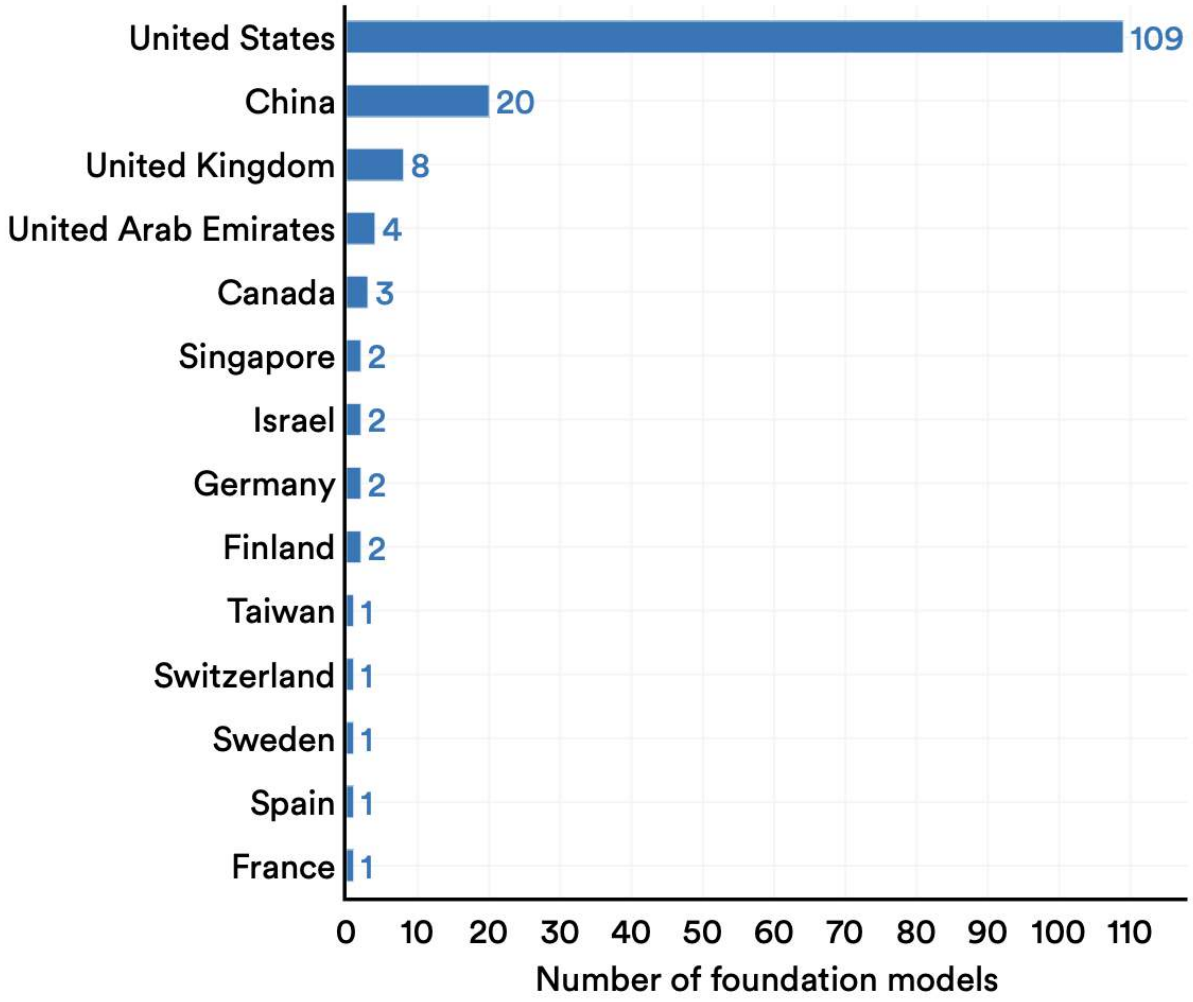
LA CINA STA GENERANDO RICHIESTE DI BREVETTI SU A.I. 40 VOLTE PIU' DI TUTTA L'EUROPA E 5 VOLTE DEGLI USA



GLI USA GUIDANO IL MONDO NELLO SVILUPPO DEI FOUNDATION MODEL PER A.I. GENERATIVA E BATTONO LA UE 109 A 7

Number of foundation models by geographic area, 2023

Source: Bommasani et al., 2023 | Chart: 2024 AI Index report



Number of foundation models by select geographic area, 2019–23

Source: Bommasani et al., 2023 | Chart: 2024 AI Index report

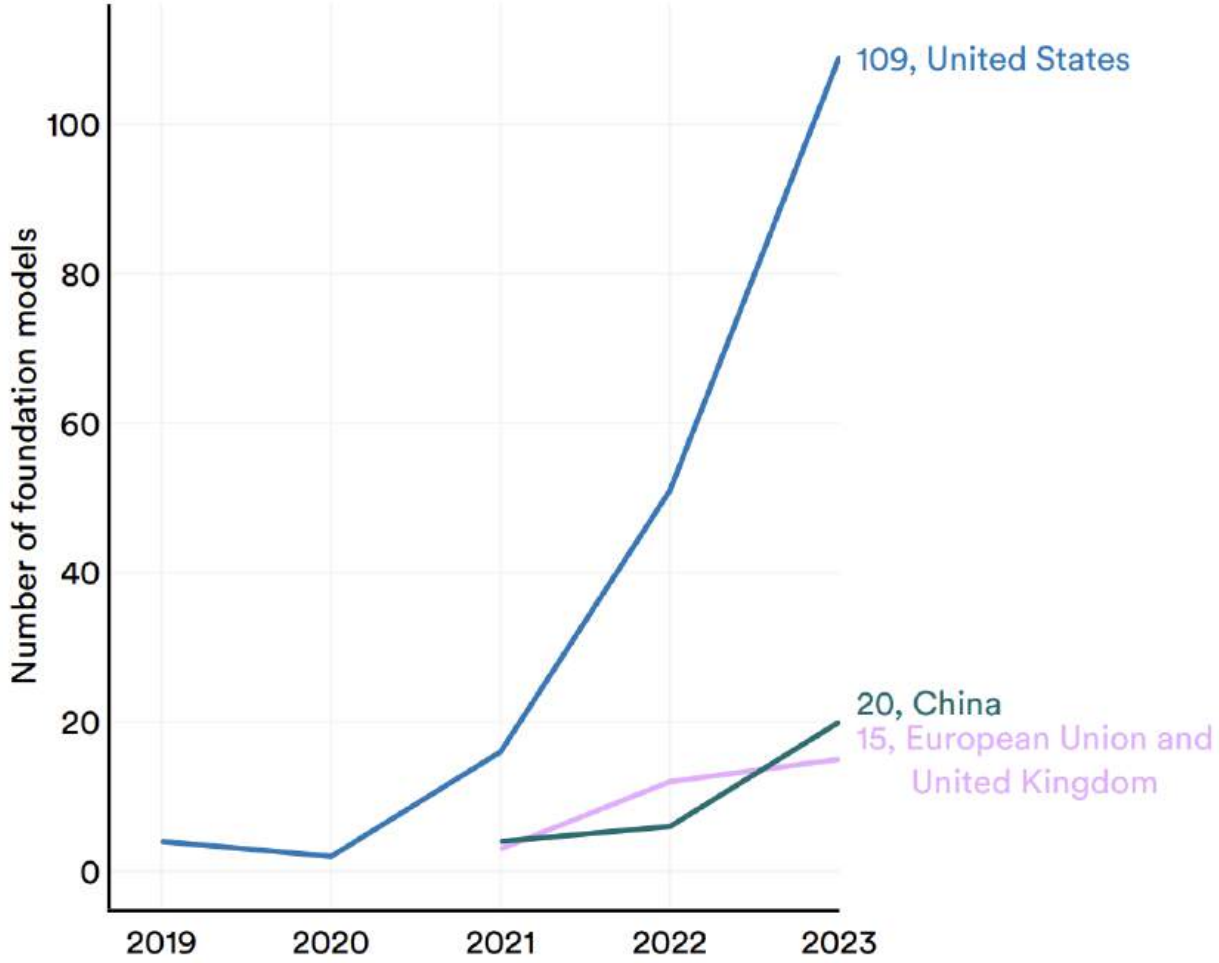
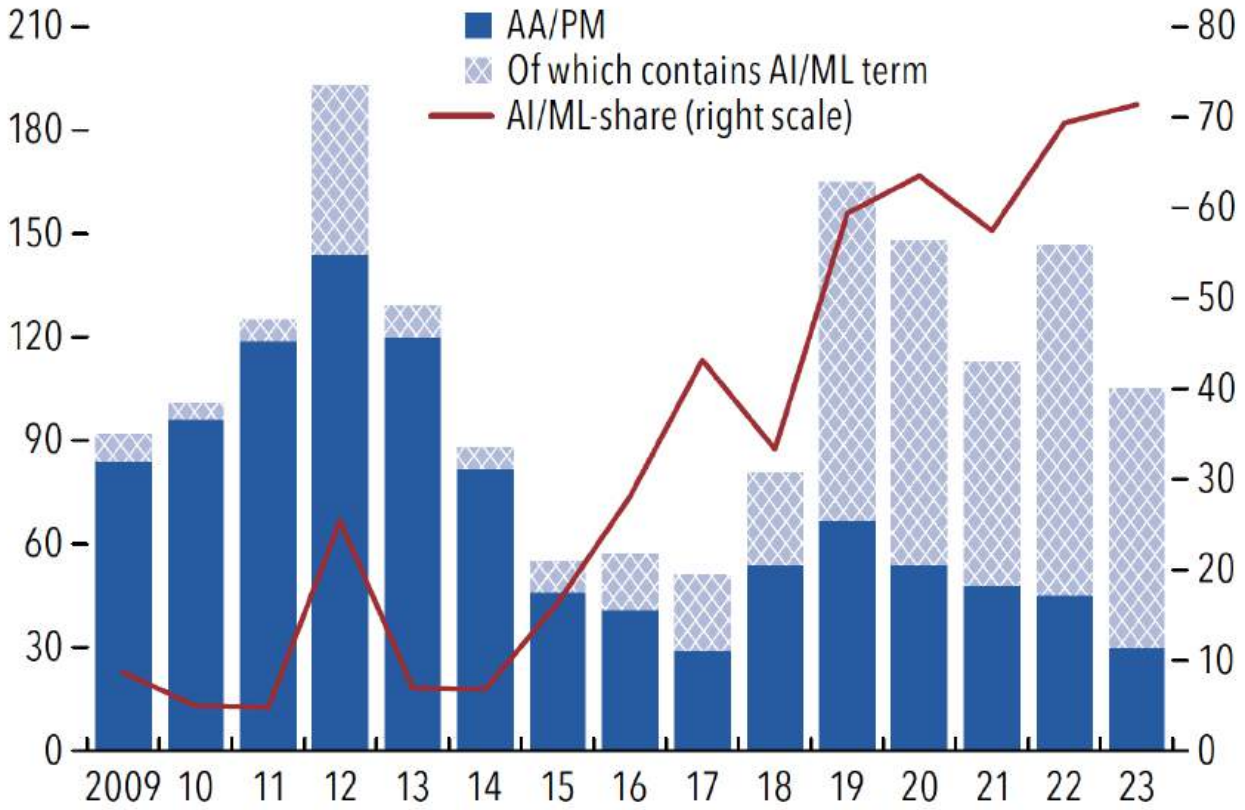


Figure ES.9. Patents in Asset Management Related to Artificial Intelligence

(Number; percent, right scale)



Sources: World Intellectual Property Organization, PATENTSCOPE database; and IMF staff calculations.

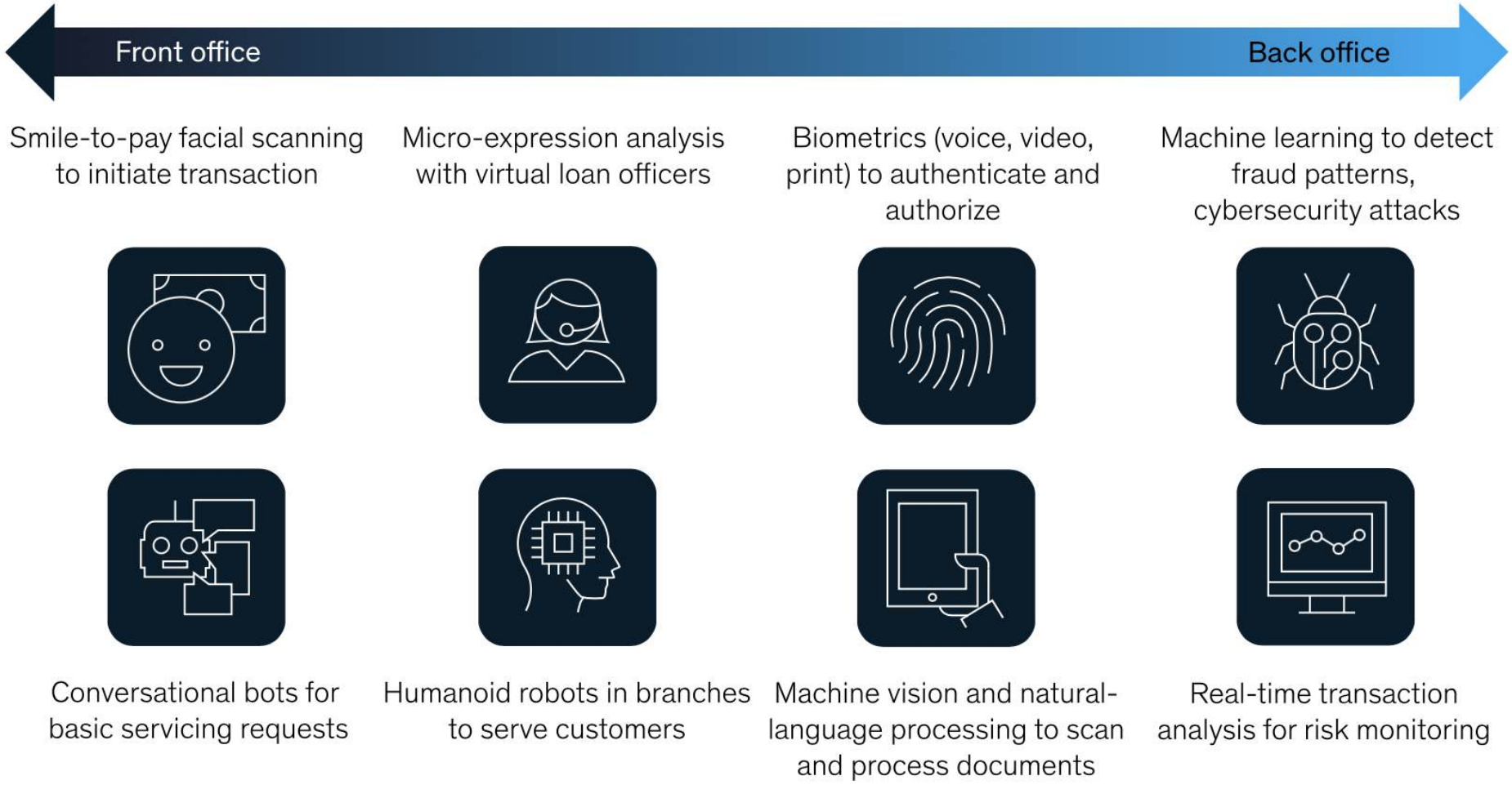
Note: Aggregate patents may not be an exhaustive accounting of all patents filed with national authorities and are limited to those available in the PATENTSCOPE database. See Chapter 3 for details. AA = asset allocation; AI = artificial intelligence; ML = machine learning; PM = portfolio management.

I brevetti AI nel settore asset management sono oltre il 70% del totale

Use of artificial intelligence (AI) in capital market activities may further support the growth of NBFIs. Although adoption of AI in trading and investment activities is still at a relatively early stage, it could accelerate in the coming years: For example, the share of applications related to AI and machine learning in patent filings in asset management has risen impressively in recent years (Figure ES.9). Although adopting these new technologies may bring efficiencies and cost savings to both banks and NBFIs, the latter are generally more agile and subject to fewer constraints in using AI.

AI & banking, from front-office to back-office

Banks are expanding their use of AI technologies to improve customer experiences and back-office processes.



Source: McKinsey

5 benefits of using AI in banking and finance

1. Reduction in operational costs and risk
2. Improved customer experience
3. Improved fraud detection and regulatory compliance
4. Improved loan and credit decisioning
5. Automation of the investment process

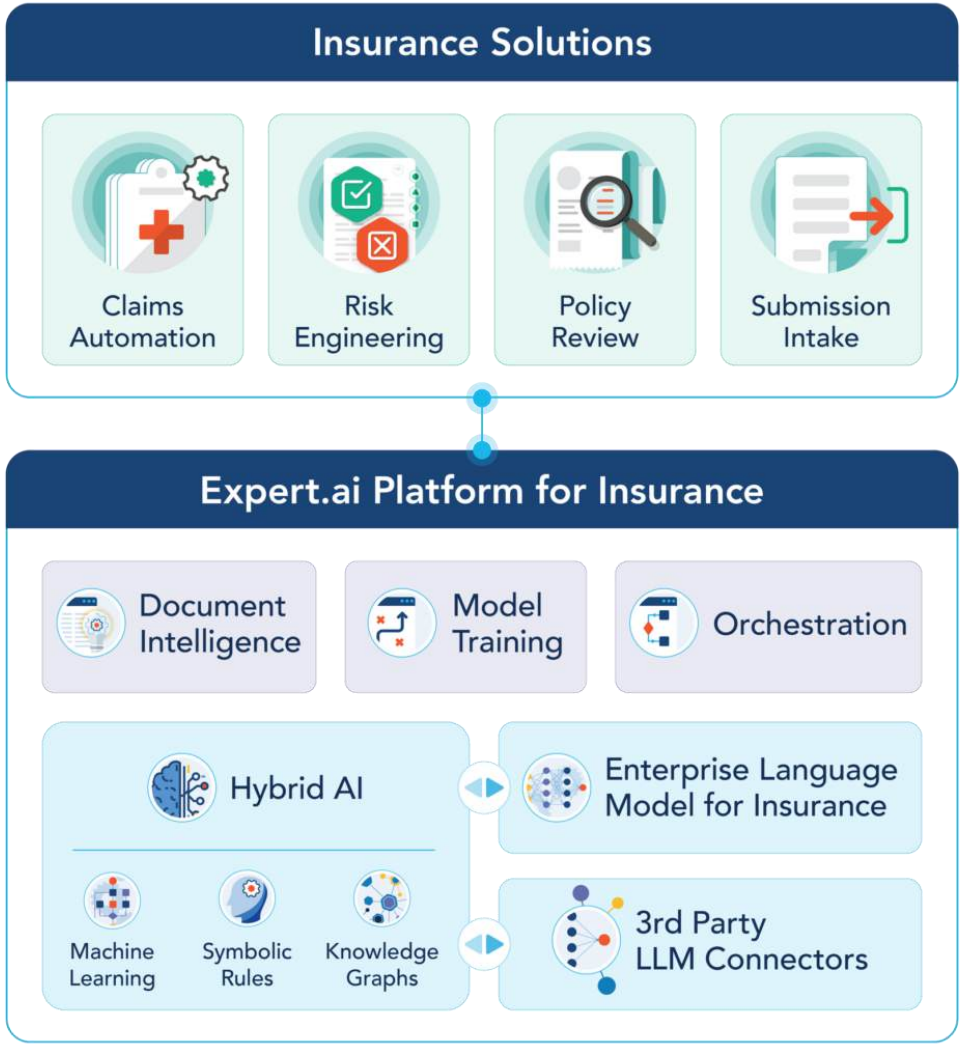
ART: NADIA_SNOPEK/ADOBE STOCK

UNA POLIZZA ASSICURATIVA E' UN MODELLO LINGUISTICO SU BASI ATTUARIALI. COME CHATGPT…

- C'è una connessione intrinseca tra il linguaggio contrattuale delle polizze assicurative e i principi matematici che regolano sia le scienze attuariali che l'intelligenza artificiale generativa (AI generativa). **Le polizze assicurative sono, infatti, contratti che si basano su calcoli attuariali** per determinare i premi e le coperture, utilizzando modelli statistici e matematici per valutare il rischio.

- L'AI generativa, d'altra parte, utilizza algoritmi per creare dati o contenuti nuovi, imparando da grandi quantità di dati esistenti. Questo processo si basa su principi logico-matematici simili a quelli usati nelle scienze attuariali, come la probabilità e la statistica.

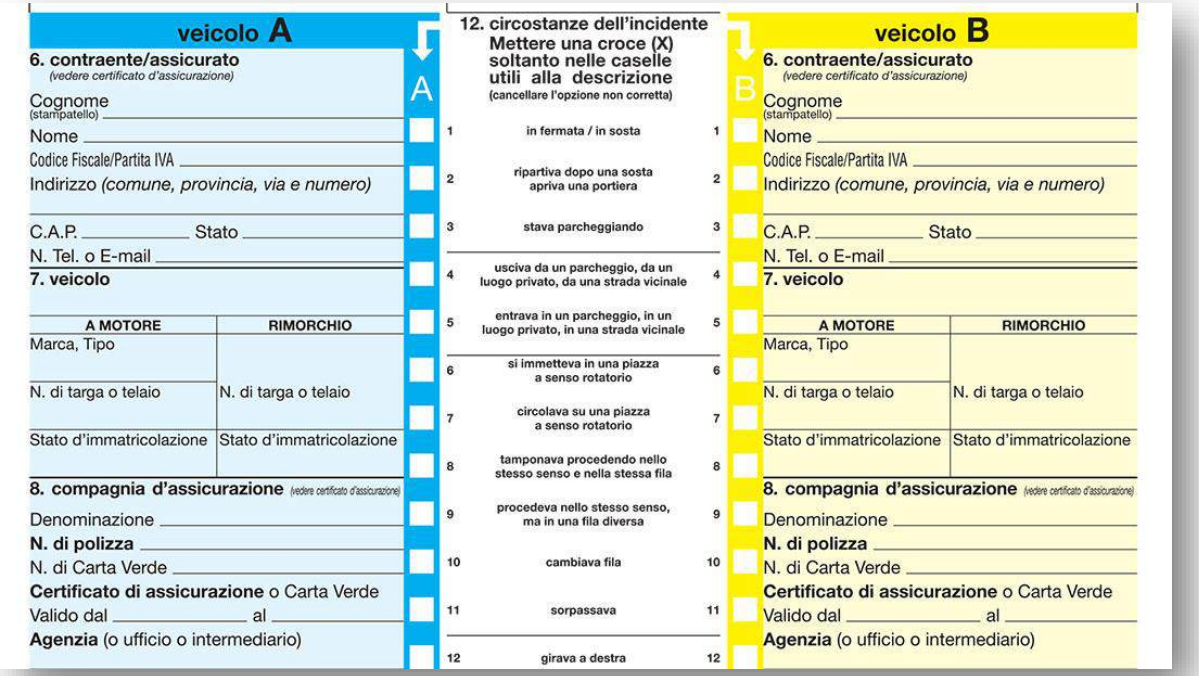
- L'AI generativa e l'assicurazione condividono una base comune di logica matematica e, con l'avanzare della tecnologia, la loro interazione non potrà che portare innovazioni significative nel settore assicurativo, per esempio trasformando le polizze in «smart contracts» scritti da Gen AI e regolati da meccanismi basati su blockchain



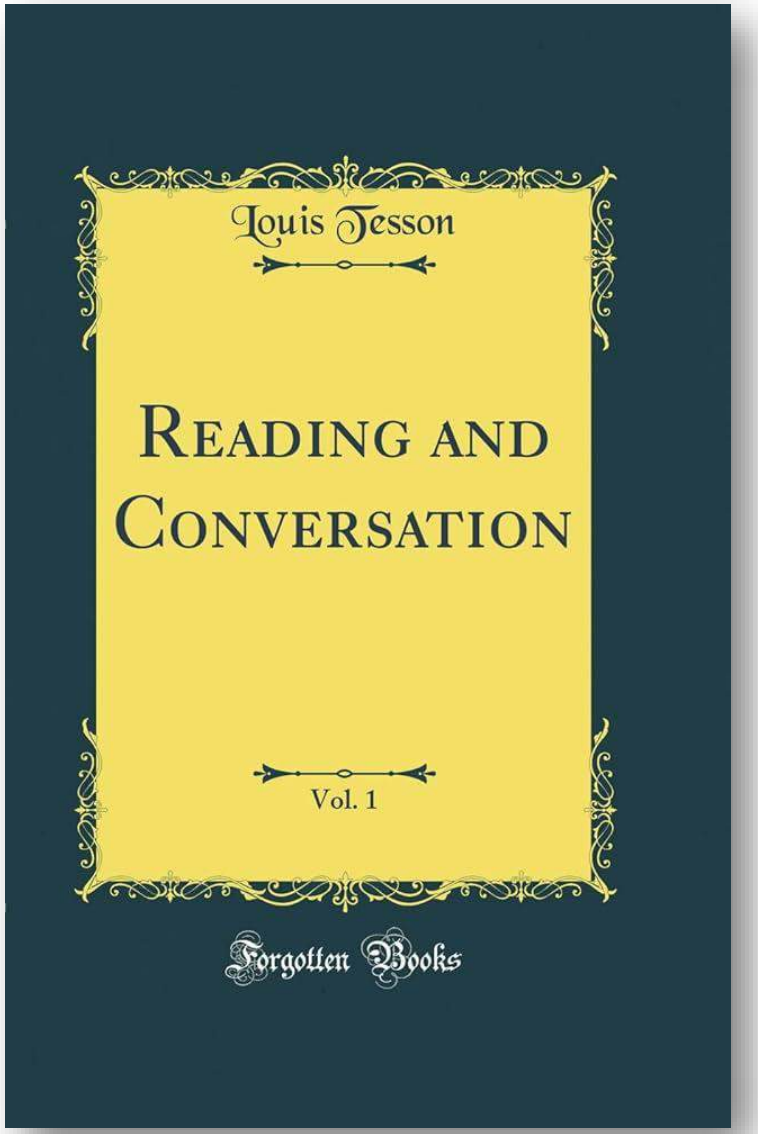
CELEBRIAMO LA FINE DEL «MODULO»

Il modello mutualistico dell'assicurazione evolve:

- dalla **lettura periodica** alla **conversazione sistematica**
- dal **formalismo della sintassi** alla **sostanza della semantica**.



veicolo A		12. circostanze dell'incidente Mettere una croce (X) soltanto nelle caselle utili alla descrizione (cancellare l'opzione non corretta)		veicolo B
6. contraente/assicurato (vedere certificato d'assicurazione) Cognome (stampatello) Nome Codice Fiscale/Partita IVA Indirizzo (comune, provincia, via e numero) C.A.P. Stato N. Tel. o E-mail	A	1 in fermata / in sosta 1 2 ripartiva dopo una sosta apriva una portiera 2 3 stava parcheggiando 3 4 usciva da un parcheggio, da un luogo privato, da una strada vicinale 4 5 entrava in un parcheggio, in un luogo privato, in una strada vicinale 5 6 si immetteva in una piazza a senso rotatorio 6 7 circolava su una piazza a senso rotatorio 7 8 tamponava procedendo nello stesso senso e nella stessa fila 8 9 procedeva nello stesso senso, ma in una fila diversa 9 10 cambiava fila 10 11 sorpassava 11 12 girava a destra 12	B	6. contraente/assicurato (vedere certificato d'assicurazione) Cognome (stampatello) Nome Codice Fiscale/Partita IVA Indirizzo (comune, provincia, via e numero) C.A.P. Stato N. Tel. o E-mail
7. veicolo A MOTORE: Marca, Tipo; N. di targa o telaio; Stato d'immatricolazione RIMORCHIO: N. di targa o telaio; Stato d'immatricolazione				7. veicolo A MOTORE: Marca, Tipo; N. di targa o telaio; Stato d'immatricolazione RIMORCHIO: N. di targa o telaio; Stato d'immatricolazione
8. compagnia d'assicurazione (vedere certificato d'assicurazione) Denominazione N. di polizza N. di Carta Verde Certificato di assicurazione o Carta Verde Valido dal al Agenzia (o ufficio o intermediario)				8. compagnia d'assicurazione (vedere certificato d'assicurazione) Denominazione N. di polizza N. di Carta Verde Certificato di assicurazione o Carta Verde Valido dal al Agenzia (o ufficio o intermediario)



TESI: CON L'AI GENERATIVA IL FOCUS DEL MODELLO DI BANCASSURANCE PASSA DAL **RISK MANAGEMENT** AL **BEHAVIOURAL MANAGEMENT**

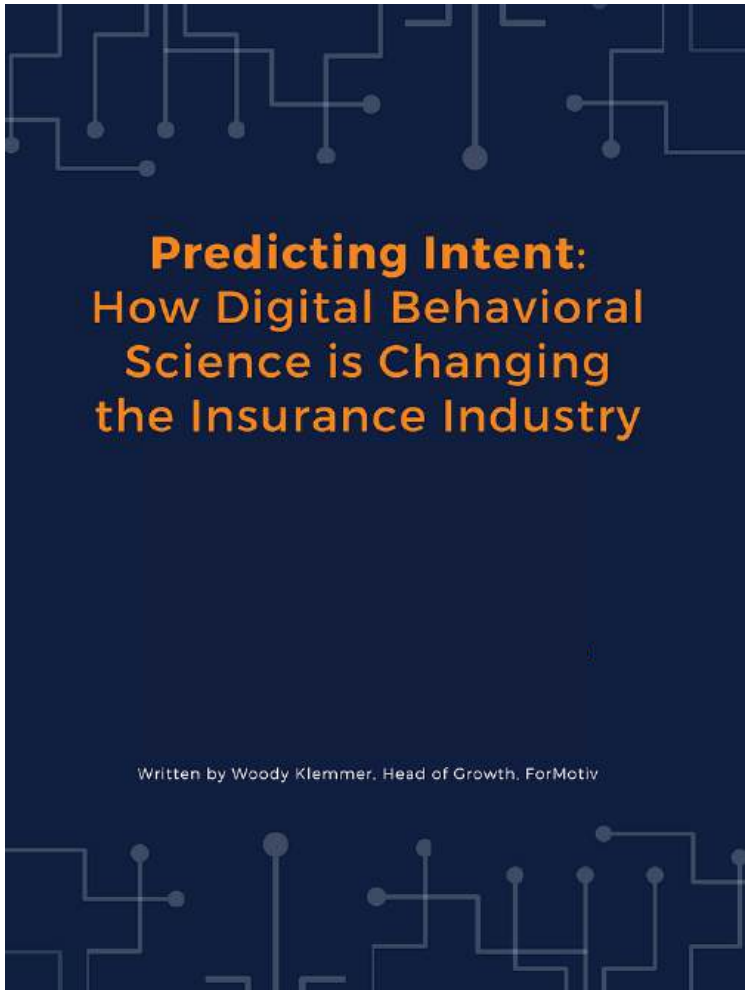
$$R = f(X * Y)$$

Dove:

- **X = esogeno**, prevalentemente randomico, come i rischi ambientali, ma sempre più prevedibile grazie a modelli data-driven di contesto. Basato su **dati quantitativi** che supportano processi descrittivi, discriminativi, classificativi, predittivi.
- **Y = endogeno**, a sua volta **Y= f(a,b,c),** dove:
  - a = **asimmetry**
  - b = **behaviour**
  - c = **coordination**

  Basato non solo su dati quantitativi, ma su **elementi qualitativi del linguaggio**: dialogici, frequenti, personali, orientati all'allineamento degli incentivi mutualistici.

  Finora gli assicuratori si sono concentrati sulla **lettura del mondo**; da ora in avanti, dovranno imparare la **conversazione** indirizzata **agli incentivi comportamentali.**



A.I. E FUNZIONE SOCIALE DELL'ASSICURAZIONE

L'assicurazione è un **accordo** in base al quale un gruppo di individui che affrontano rischi simili possono **condividere le perdite** di pochi **trasferendo i rischi** all'assicuratore che si impegna a compensare le perdite.

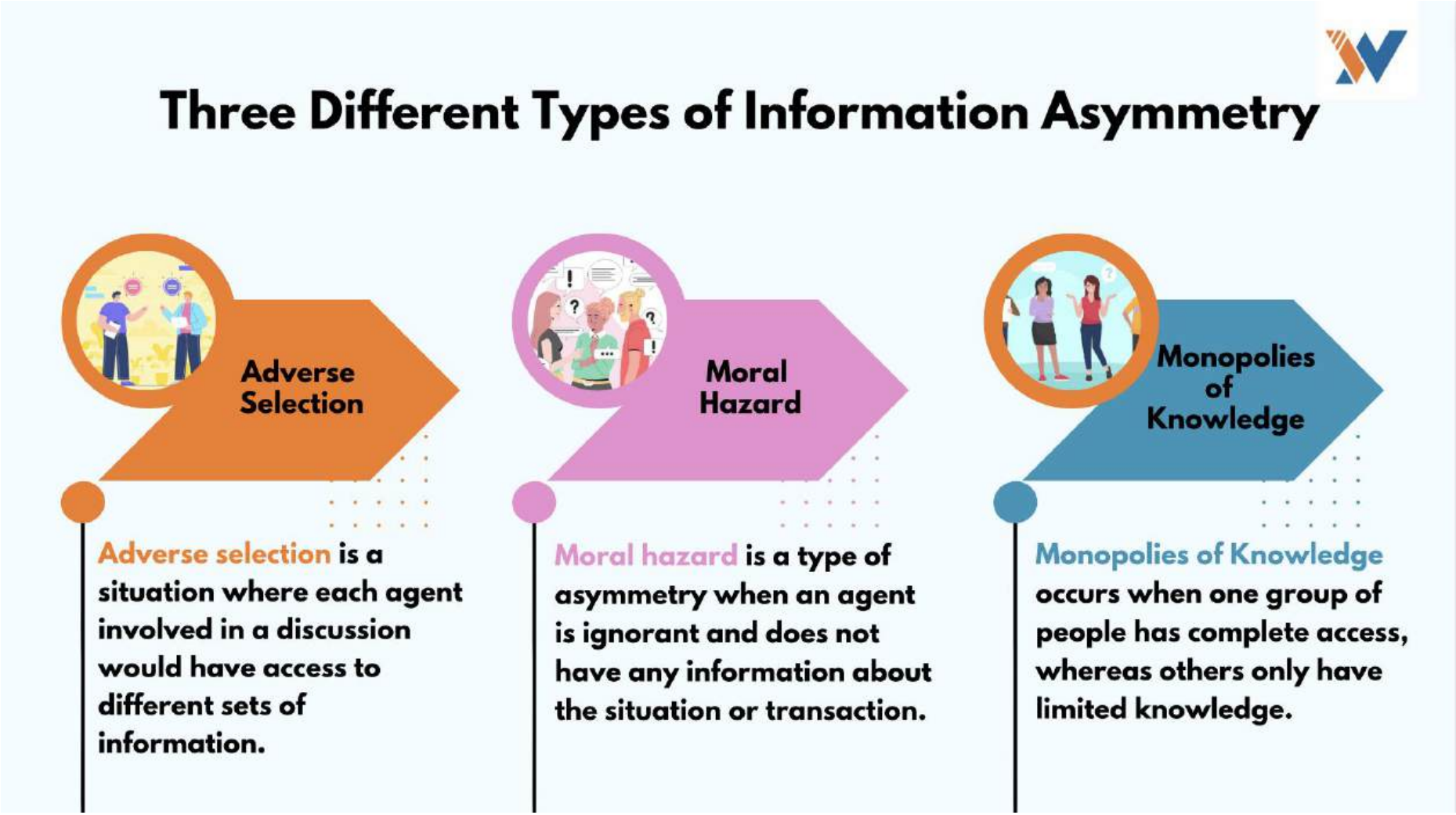
FUNZIONE PRIMARIA:
- Meccanismo di trasferimento del rischio

FUNZIONI SECONDARIE:
- Liberare fondi altrimenti vincolati nelle riserve
- Riduzione delle perdite
- Risparmio
- Beneficio sociale

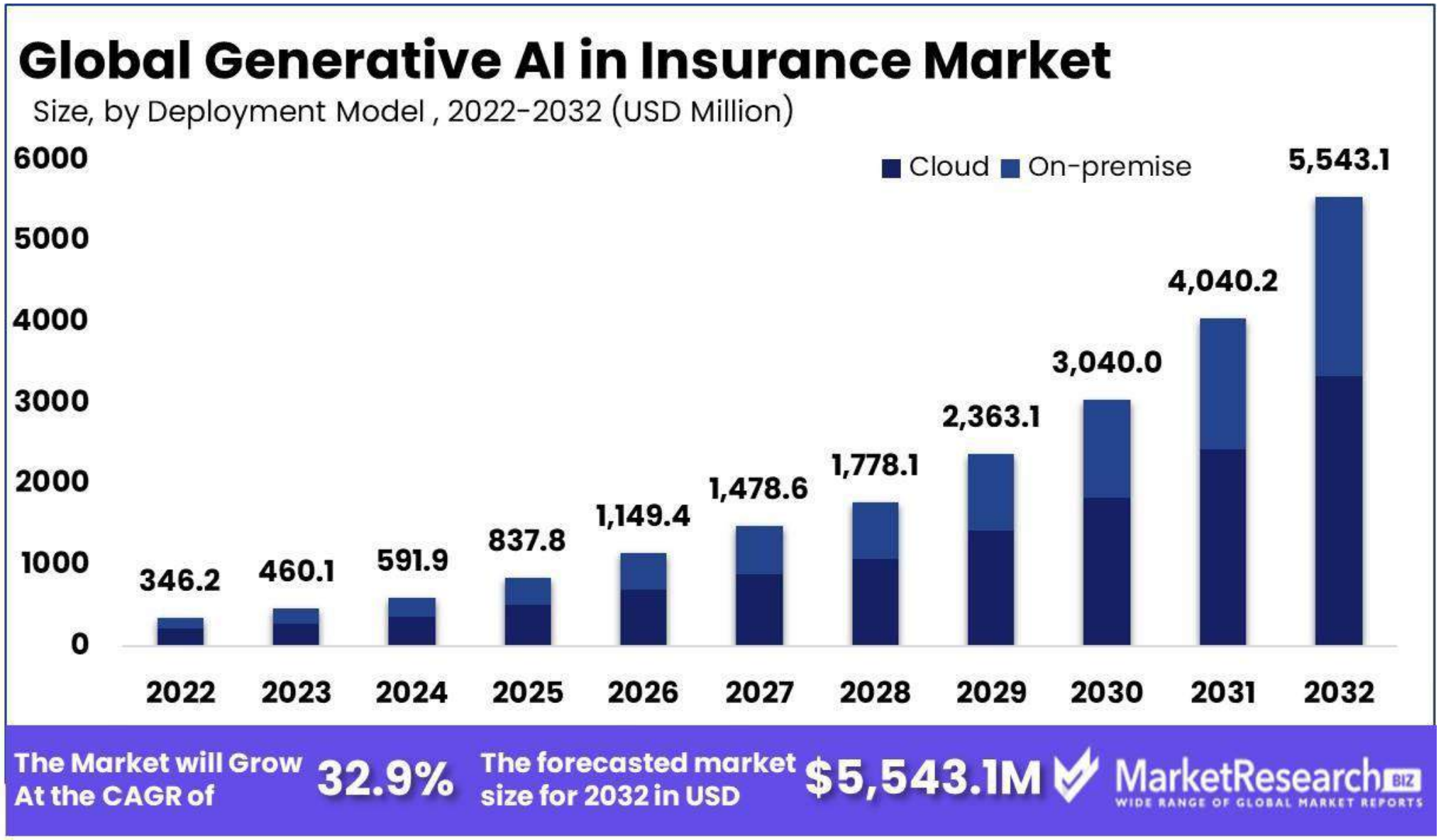
FUNZIONI INDIRETTE:
- Investimenti di fondi
- Esportazione invisibile

La **legge dei grandi numeri** afferma che quanto più ampio è il gruppo di rischi simili, tanto più le perdite effettive subite dal gruppo si avvicineranno alle perdite attese. Questa legge implica che quanto maggiore è il numero di rischi simili, tanto più accurato sarà l'assicuratore nel prevedere il rischio perdite future. Consente all'assicuratore di fissare il premio in anticipo L'assicuratore può valutare il rischio e fissare un premio che riflette il rischio e il valore del rischio che un assicurato trasferisce nel pool.

Generative AI: Information Asymmetry and Behavioral Economics



GENERATIVE AI: IL TREND DI MERCATO NEL SETTORE ASSICURATIVO



AI: CASI D'USO SU TUTTA LA CATENA DEL VALORE

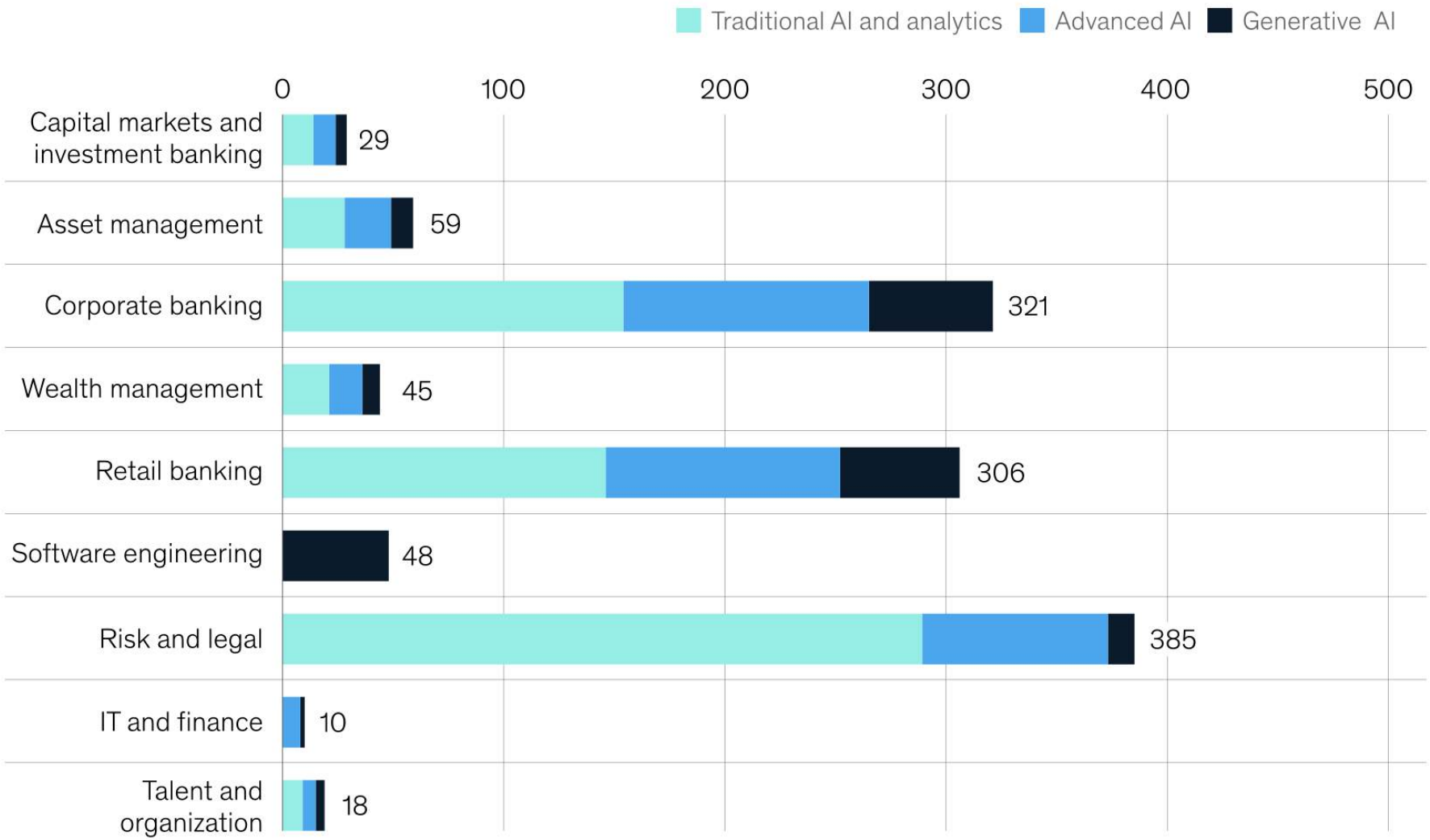
	Marketing	Product development	Sales & distribution	Underwriting	Customer service & policy administration	Claims management
Use cases	• Predictive analytics • Automated demand analysis	• Analysis of customer preferences • Product innovation	• Tailored product advice • Sales process automation	• Image analysis • Natural language processing (NLP)	• Predictive analysis • Voice recognition • NLP • Risk prevention and mitigation	• Prediction of claim patterns • Image recognition • Anomaly/fraud detection
Benefits	• New marketing channels • Tailored outreach	• Accurate pricing • Tailored products • Rapid product adjustment	• Reducing sales costs, thus enhancing affordability	• Improved quality/speed of risk analysis, including complex risks	• Personalised service • Improved customer engagement • Increased resilience of insureds	• Accurate claims assessments • Fraud reduction • Faster responses

AI: RISCHI E APPROCCI DEL SETTORE ASSICURATIVO

	Lack of transparency & explainability	Discrimination, bias & lack of fairness	Unaffordability & exclusion	Data
Risks	• AI algorithms are considered black boxes due to their complexity • Difficulty in explaining causation and the role of each variable used and, therefore, in checking whether algorithms are fair and unbiased	• Bias, errors, or inaccuracies in AI outcomes can lead to unwanted correlations and indirect discrimination • Difficulty in manually assessing numerous rating factors and their combinations in AI-driven insurance • Tension between correlations found and actuarial fairness/ acceptability	• AI-enabled granularity of risk assessments leads to a shift away from solidarity-based risk pools towards individualised pricing • Some customers may benefit, while others face higher premiums • In the extreme, certain customers may become uninsurable	• Risk of data quality and accuracy: different data types (provided, observed, derived, inferred and synthetic) have varying levels of reliability and accuracy, which all affect AI outcomes in their own way • While provided and observed data enhance AI models' explainability and accuracy, they may compromise privacy protection
Insurer approaches	• Define use-case-specific transparency requirements, including on data sources feeding into AI models • Implement audit trails for AI models	• Develop methodologies to detect and prevent unwanted correlations in AI models • Limit the number of rating factors used by AI models • Develop AI training programme for employees	• Establish guidelines and policies around high-impact AI systems (such as those making underwriting/pricing decisions) • Build specific governance structures to address AI risks and dilemmas	• Data-cleaning and imitation: insurers rigorously check and clean data and limit data points • Mitigate bias by employing robust governance frameworks and oversight • Focus on data security

Source: The Geneva Association

Value created by AI at stake by segment and function,[1] $ billion



[1]Assumes 0% overlap of traditional AI and generative AI (generative AI assumes the lower end of value at stake), top-down estimation based on projected growth and value pools.
Source: *The economic potential of generative AI: The next productivity frontier*, McKinsey Global Institute, June 2023; QuantumBlack, AI by McKinsey traditional advanced analytics and AI analysis

Massimo impatto su Retail banking, Corporate banking, Risk & Legal

Analyst Estimates: Provider and Consumer Interest in Select Generative AI Applications in Insurance

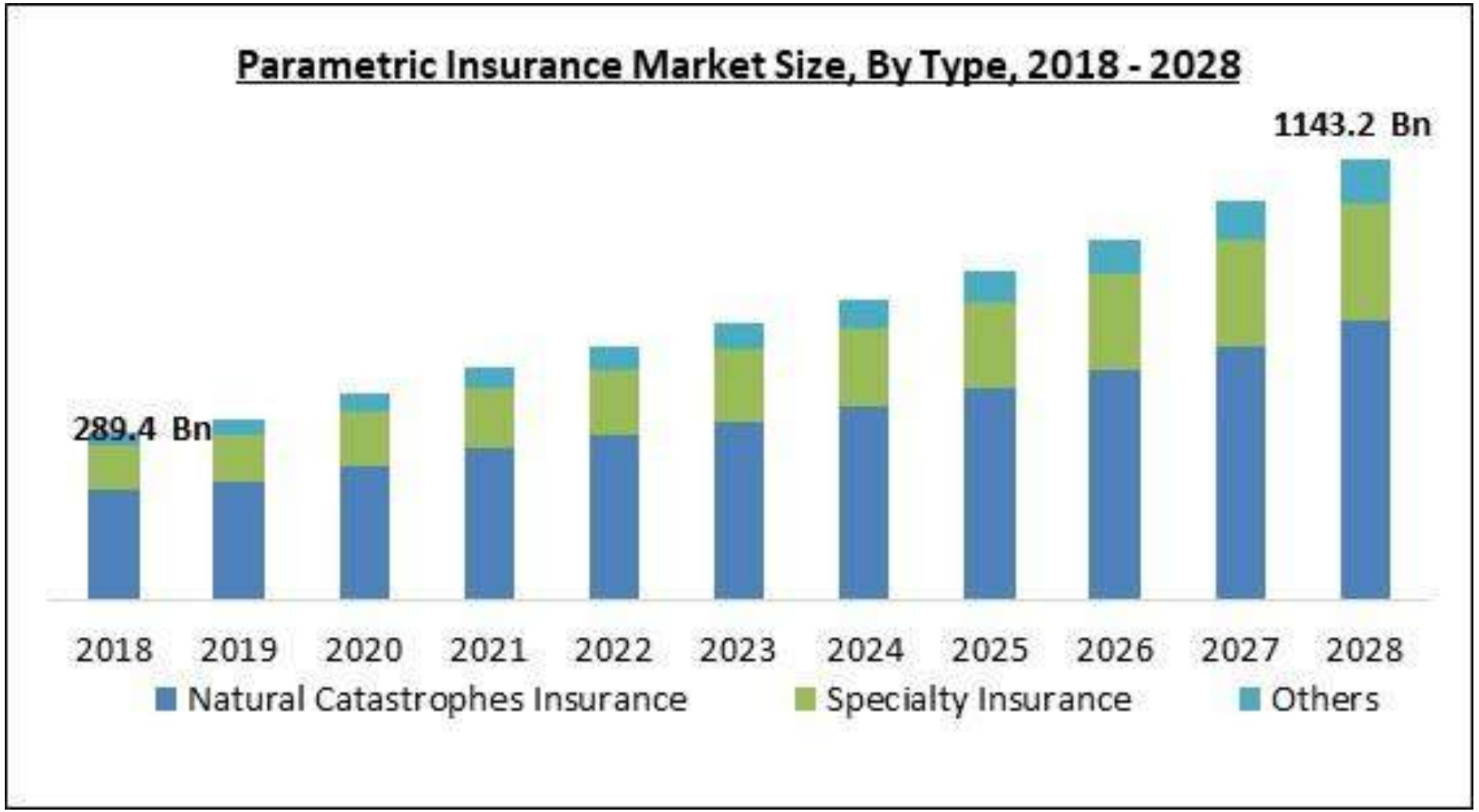
over a 3-year horizon

Source: Insider Intelligence, 2023

Generative AI: impatti previsti sul mercato assicurativo

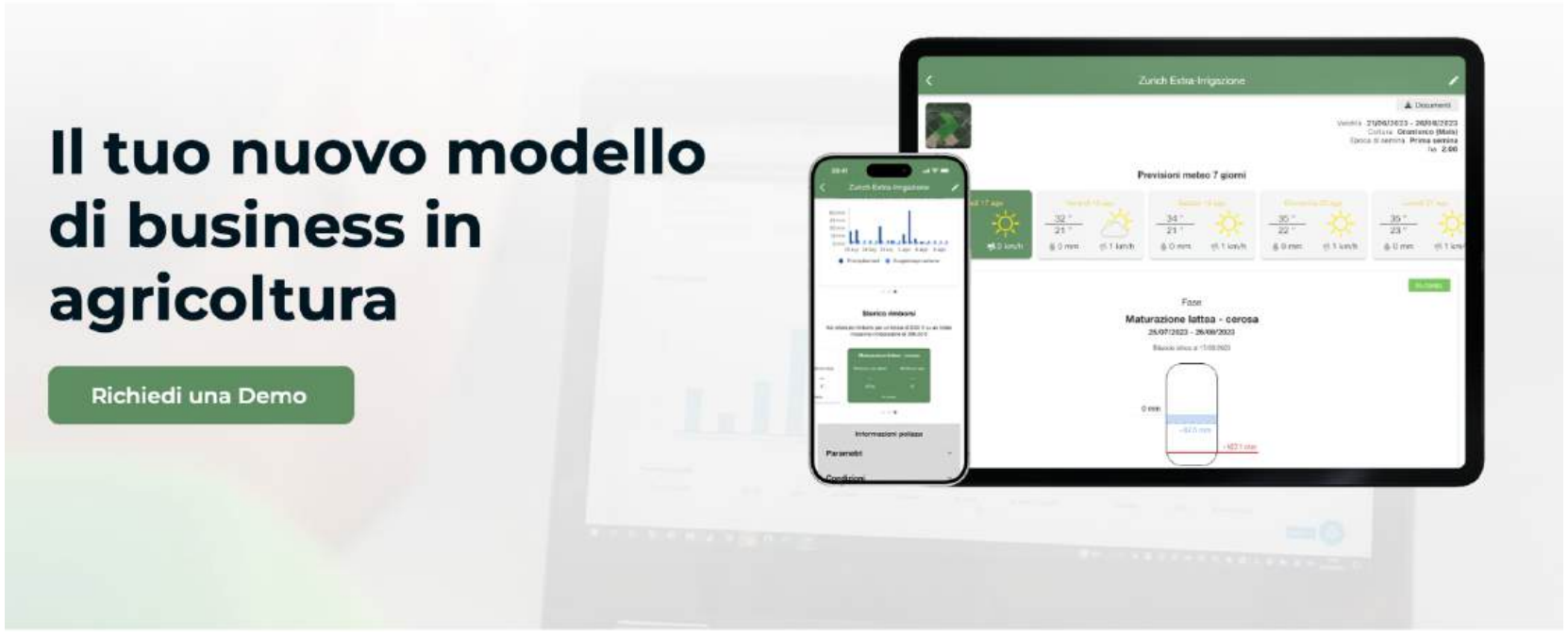
Nel corso dei prossimi anni si svilupperanno diversi casi d'uso per l'IA generativa applicata al mercato assicurativo. I più promettenti e fattibili sono le campagne di marketing personalizzate, i chatbot rivolti ai dipendenti, la prevenzione dei sinistri, l'automazione della gestione sinistri, lo sviluppo del prodotto, il rilevamento delle frodi e i chatbot rivolti ai clienti.
Sebbene esistano molti casi d'uso positivi, l'IA generativa non è attualmente adatta per underwriting e compliance.

The Worldwide Parametric Insurance Industry is Expected to Reach $21.4 Billion by 2028 at a 9.6% CAGR



ResearchAndMarkets.com

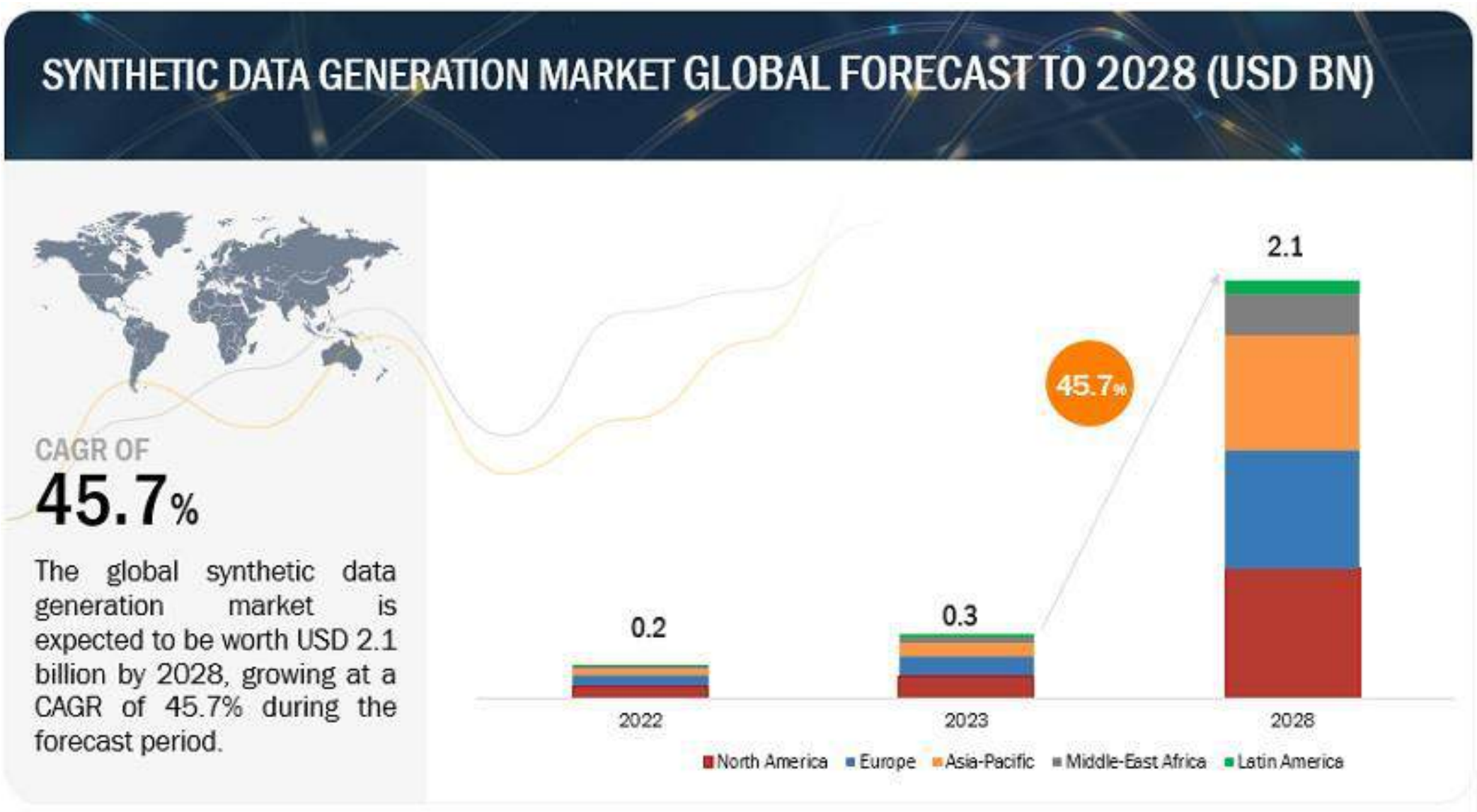
IL CASO XFARM PER LE ASSICURAZIONI AGRARIE



Un partner di cui ti puoi fidare

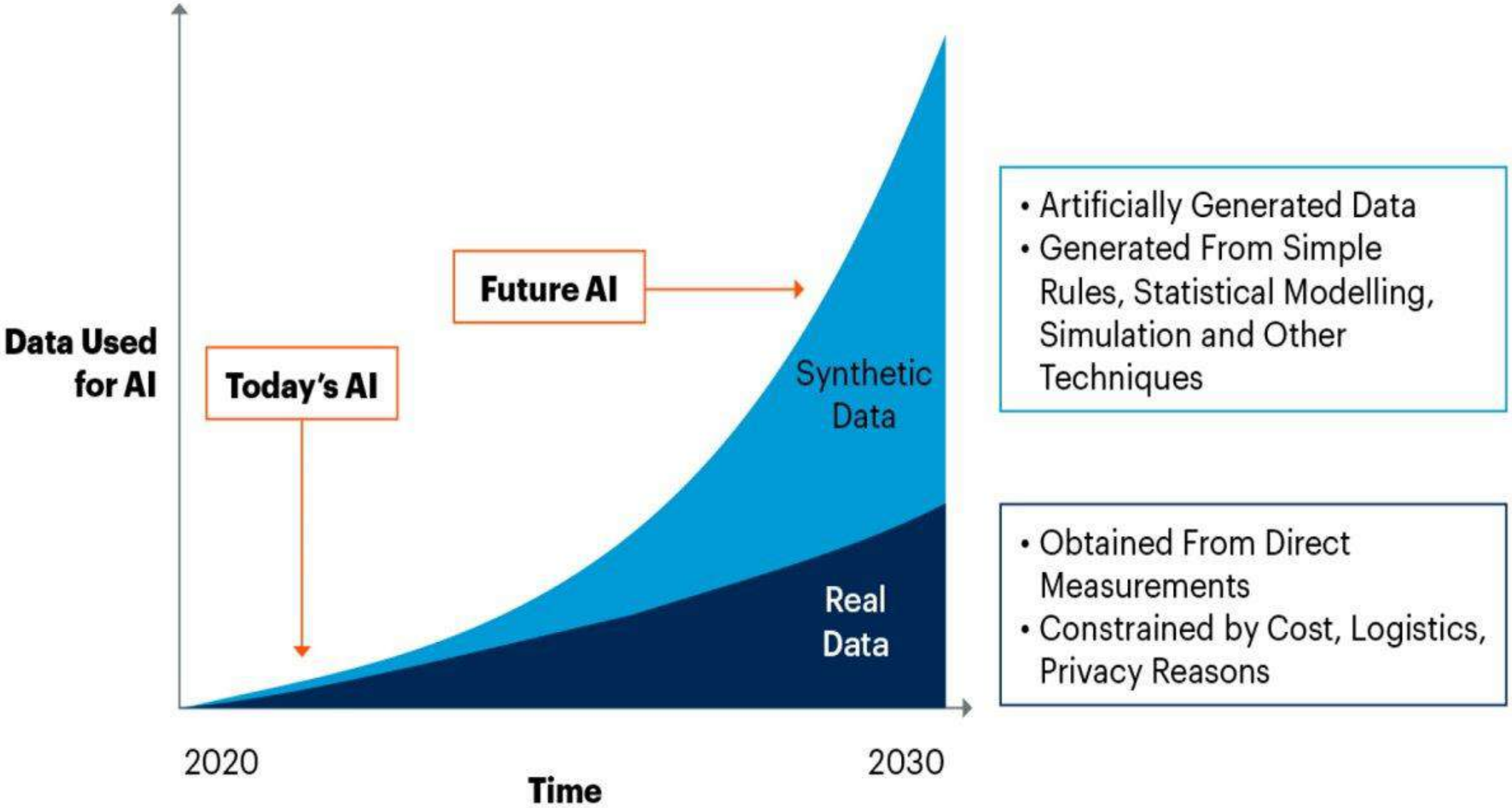
4.150.000+	340.000+	8.000+	6.000+	414
Ettari digitalizzati	Aziende agricole	Macchinari connessi	Sensori connessi	Colture supportate

Non avete i dati? Inventateveli.

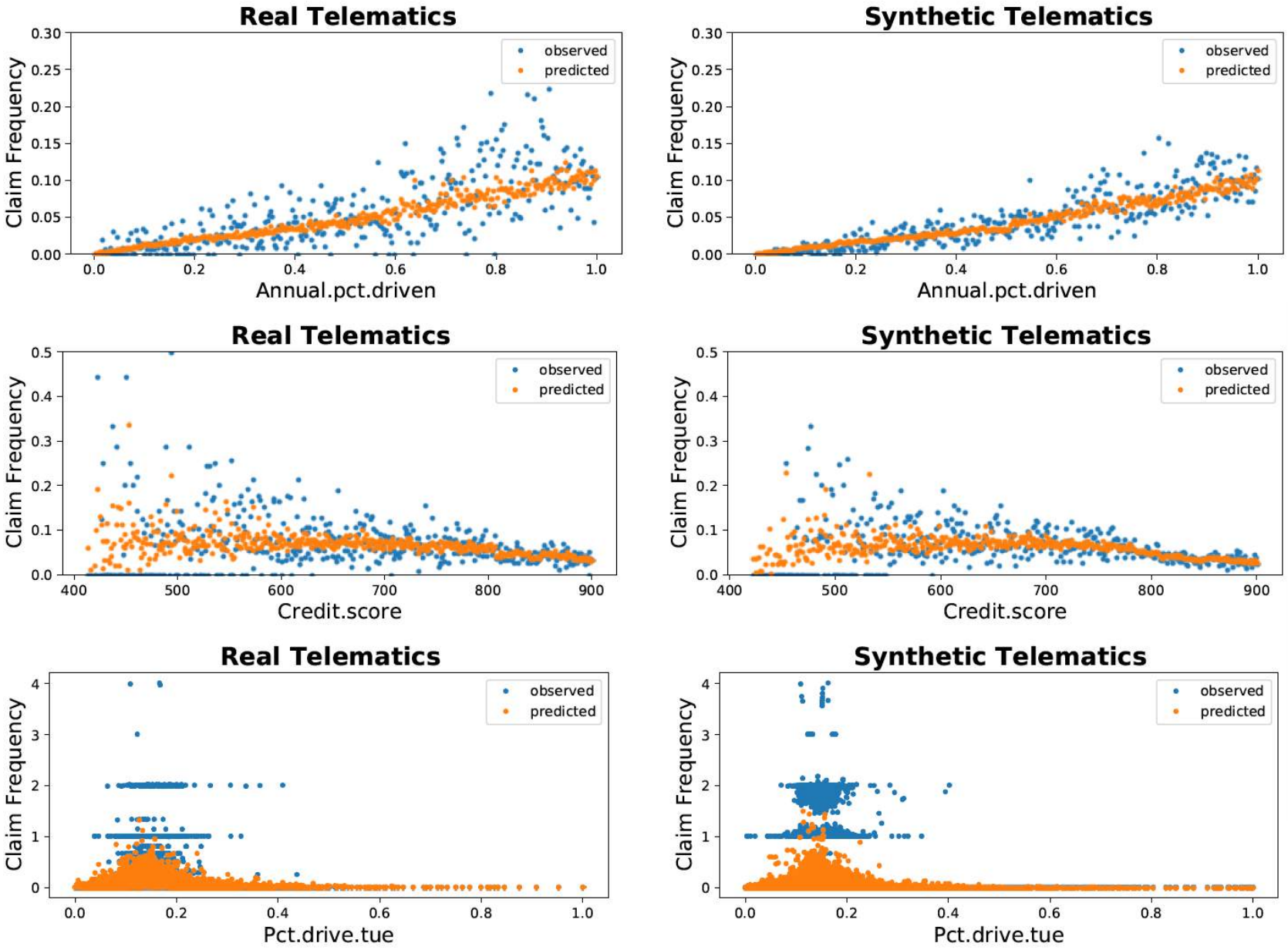


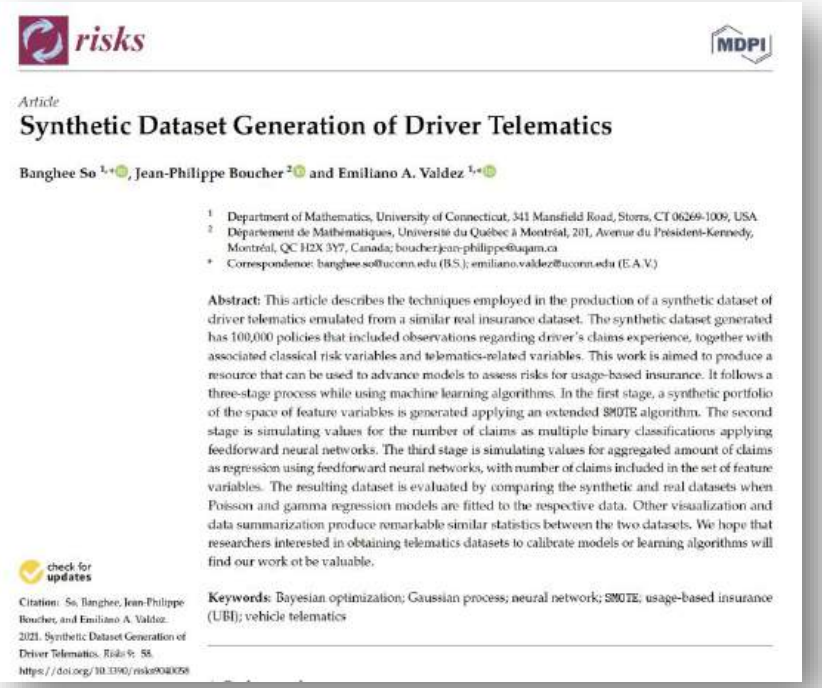
SDA Bocconi
SCHOOL OF MANAGEMENT

By 2030, Synthetic Data Will Completely Overshadow Real Data in AI Models



Source: Gartner





risks

MDPI

Article

Synthetic Dataset Generation of Driver Telematics

Banghee So [1,*], Jean-Philippe Boucher [2] and Emiliano A. Valdez [1,*]

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[2] Département de Mathématiques, Université du Québec à Montréal, 201, Avenue du Président-Kennedy, Montréal, QC H2X 3Y7, Canada; boucher.jean-philippe@uqam.ca
* Correspondence: banghee.so@uconn.edu (B.S.); emiliano.valdez@uconn.edu (E.A.V.)

Abstract: This article describes the techniques employed in the production of a synthetic dataset of driver telematics emulated from a similar real insurance dataset. The synthetic dataset generated has 100,000 policies that included observations regarding driver's claims experience, together with associated classical risk variables and telematics-related variables. This work is aimed to produce a resource that can be used to advance models to assess risks for usage-based insurance. It follows a three-stage process while using machine learning algorithms. In the first stage, a synthetic portfolio of the space of feature variables is generated applying an extended SMOTE algorithm. The second stage is simulating values for the number of claims as multiple binary classifications applying feedforward neural networks. The third stage is simulating values for aggregated amount of claims as regression using feedforward neural networks, with number of claims included in the set of feature variables. The resulting dataset is evaluated by comparing the synthetic and real datasets when Poisson and gamma regression models are fitted to the respective data. Other visualization and data summarization produce remarkable similar statistics between the two datasets. We hope that researchers interested in obtaining telematics datasets to calibrate models or learning algorithms will find our work ot be valuable.

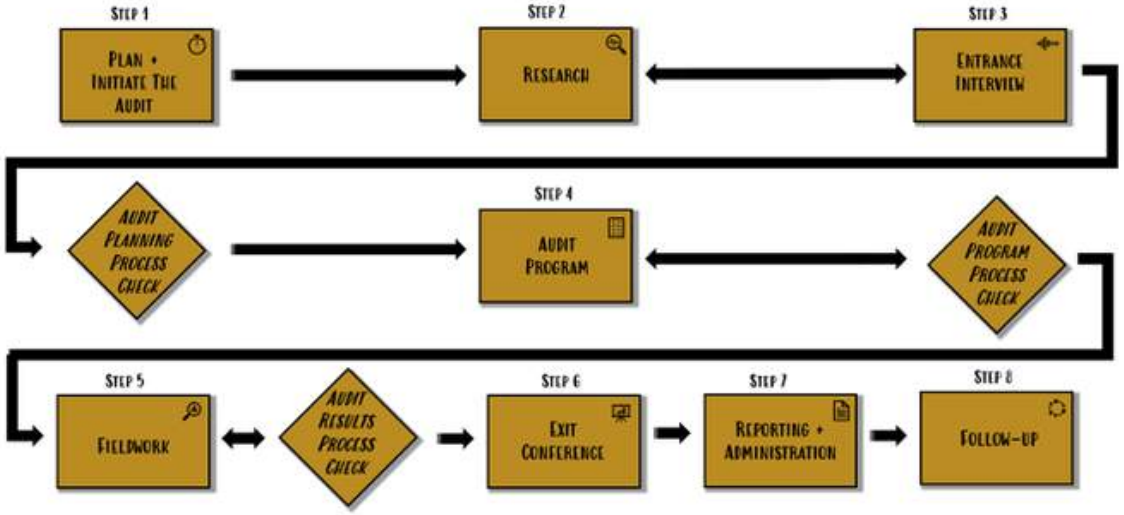
check for updates

Citation: So, Banghee, Jean-Philippe Boucher, and Emiliano A. Valdez. 2021. Synthetic Dataset Generation of Driver Telematics. *Risks* 9: 58. https://doi.org/10.3390/risks9040058

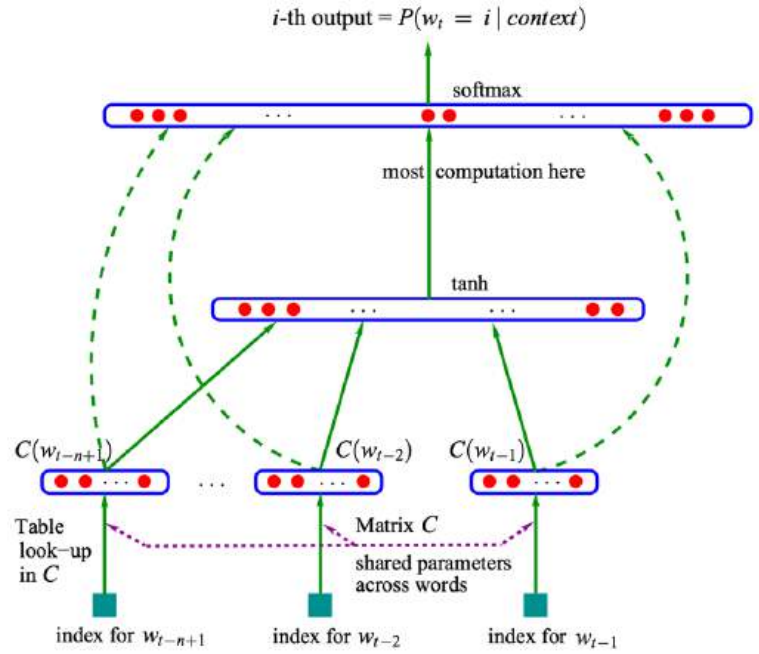
Keywords: Bayesian optimization; Gaussian process; neural network; SMOTE; usage-based insurance (UBI); vehicle telematics

Figure 5. Average claim frequency using real (**left**) and synthetic (**right**) datasets.

Con Generative AI, il workflow dei processi organizzativi collassa in un «language model» che va pre-istruito e contestualizzato



Language Model of Computational Linguistic



Da un modello «procedurale» a un modello «conversazionale»
E dal formalismo all'inclusività

INSEAD The Business School for the World®

Case Study

Lemonade: Delighting Insurance Customers with AI and Behavioural Economics:

A Disruptive InsurTech Business Model for Outstanding Customer Experience and Cost-Effective Service Excellence

Forget Everything You Know About Insurance

Lemonade

Case Synopsis

This case explores how fast-growing insurtech start-up Lemonade creates and delivers an outstanding customer experience in an industry plagued by chronically low customer satisfaction levels and is thus ripe for disruption. In the face of fast-evolving buyer behaviours and digital technologies, incumbents are slow to react and mainly focus on improving legacy systems and operations. Meanwhile, Lemonade redesigns the customer experience and the insurance business model from the ground up to tackle an essentially flawed model worn down over decades by inherent conflicts of interest and a fundamental lack of trust among parties involved. With $480 million raised in funding, revenues reach $100 million by year-end 2019. In addition to covering half the US, Lemonade expands to Germany and the Netherlands.

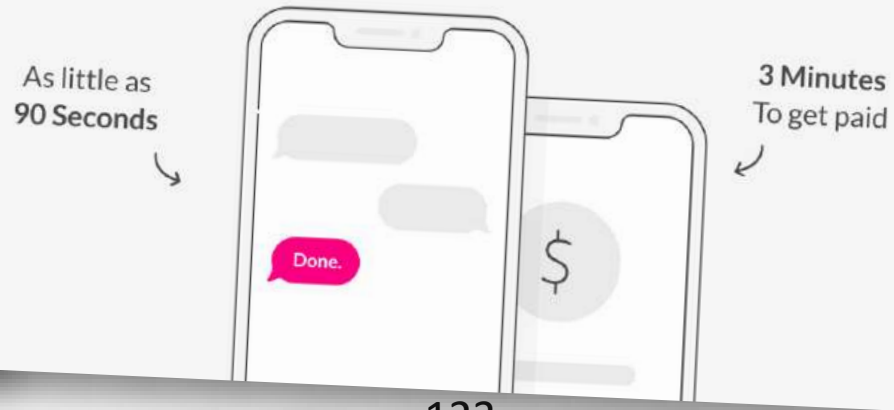
The case explores how Lemonade fulfils its ambition to create a "shockingly great user experience" built around a "lovable brand", starting with the building blocks of its business model, e.g. an initially narrow insurance offer, flexible low-priced monthly subscriptions, a Giveback Programme for gifting unpaid claims to charities, and open-sourced transparent policy. It reveals how Lemonade manages an impressive workflow with few employees. Technology automates and accelerates the underwriting and claims-handling process, reduces customer effort and boosts satisfaction, while dramatically cutting costs.

Forget Everything You Know About Insurance

Instant everything. Incredible prices. Big heart.

Instant Everything

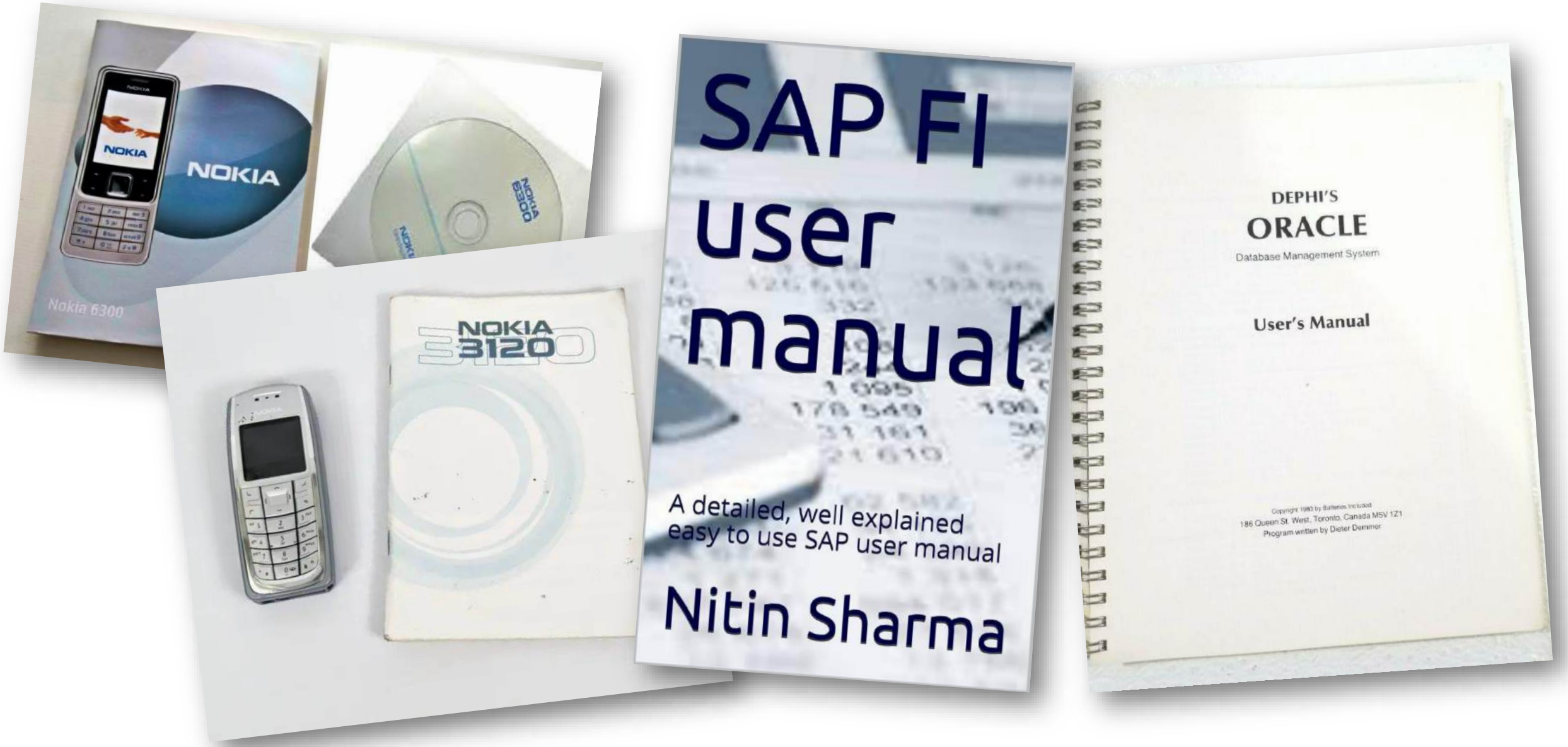
Maya, our charming artificial intelligence bot, will craft the perfect insurance for you.
It couldn't be easier, or faster



Come Google ha reso inutili le Pagine Gialle, così ChatGPT rende obsoleti i manuali d’istruzione (e anche le polizze…?)

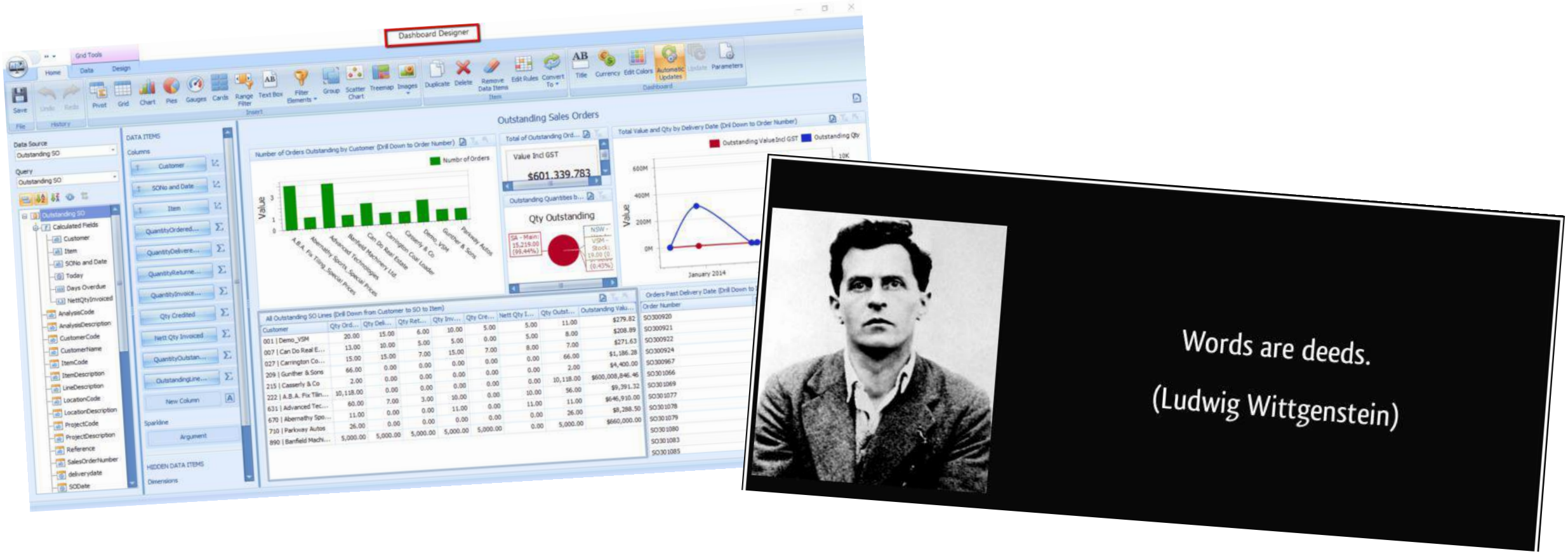
OpenAI

La scomparsa dei «manuali d'uso»

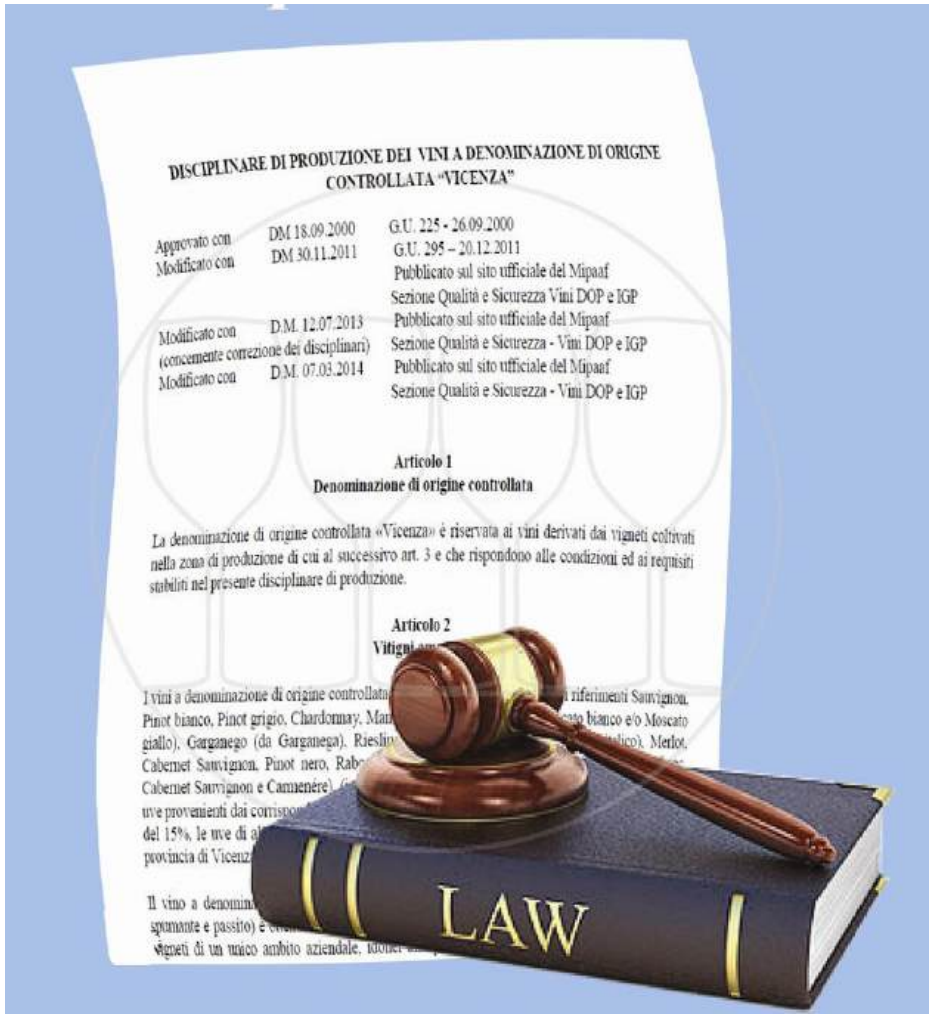


Figures are facts, words are deeds

Dashboards vs. Wittgenstein: la tecnologia generativa evolve dai processi descrittivi ai poteri dispositivi e determinativi



Il management è la trasformazione delle parole legittime in atti organizzativi



Messaggi, e-mail, ordini, verbali, manuali, disciplinari, regole, norme, leggi, costituzioni, dogmi…

Smettere di scrivere ordini di servizio e cominciare a fare training su un modello di linguaggio

ORDINE DI SERVIZIO N. 37

Milano:

A tutto il personale

Oggetto: procedura di apertura studio (da effettuare tutte le mattine all'entrata)

1. Bloccare antifurto.
2. Apertura tapparelle e verifica finestre
3. Accendere distributore acqua in sala attesa.
4. Accendere tutti i computer (compreso quello dello studio privato) e le stampanti.
5. Accendere tutte le poltrone, la centralina rx e i monitor telecamera porta.
6. Accendere Ortopantomografo e compressore.
7. Apertura e verifica dell'aria condizionata e/o ventilazione ricircolo aria.
8. Apertura acqua centralizzata.
9. Verificare segreteria telefonica e ascoltare eventuali messaggi.
10. Verifica agenda e predisporre sale per i primi pazienti.

Per eseguire la procedura di apertura studio è tassativamente necessario essere in studio non meno di quindici minuti prima dell'inizio del primo appuntamento.

Dott. Germano Usoni-Dott.sa Enrica Rebagliati

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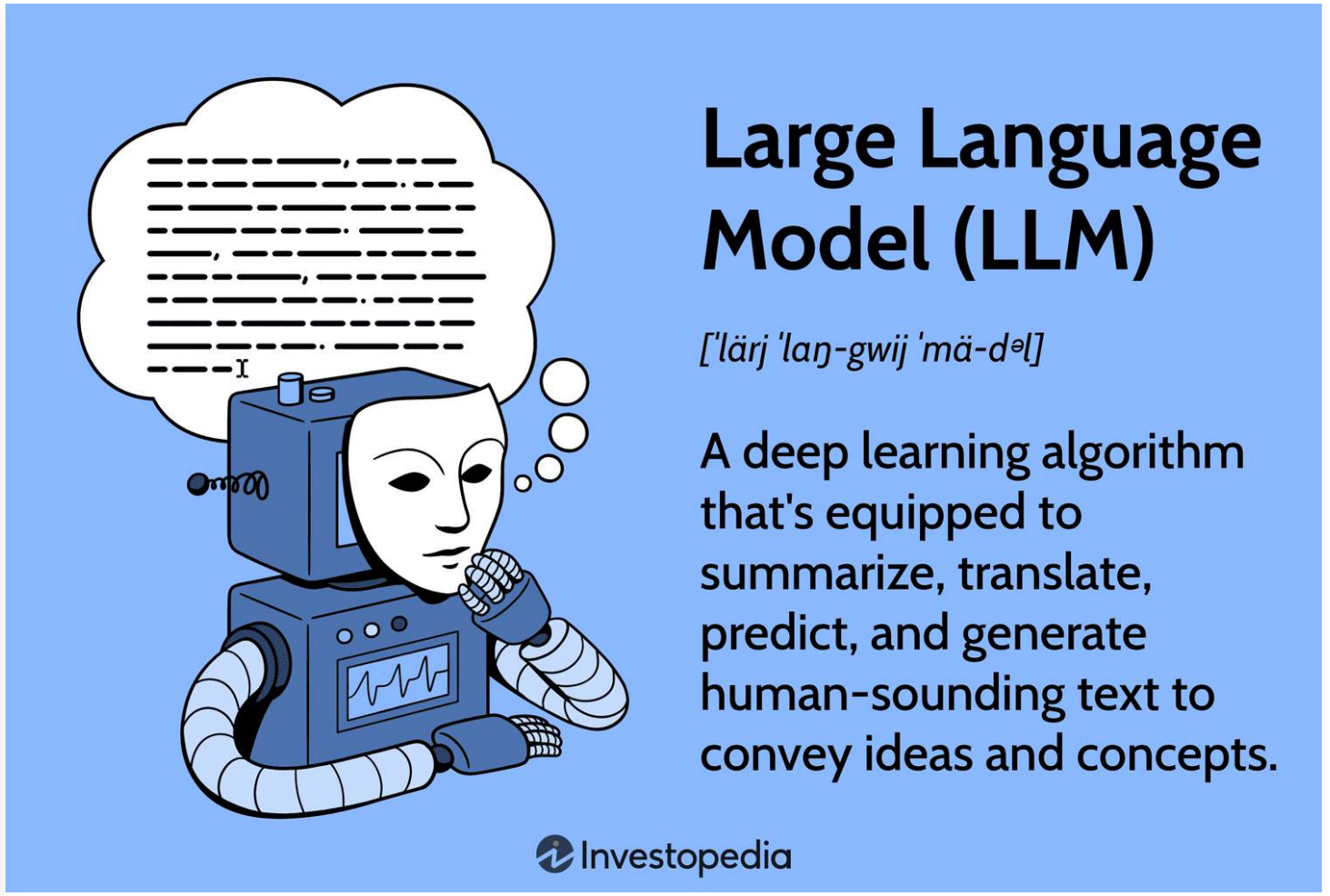
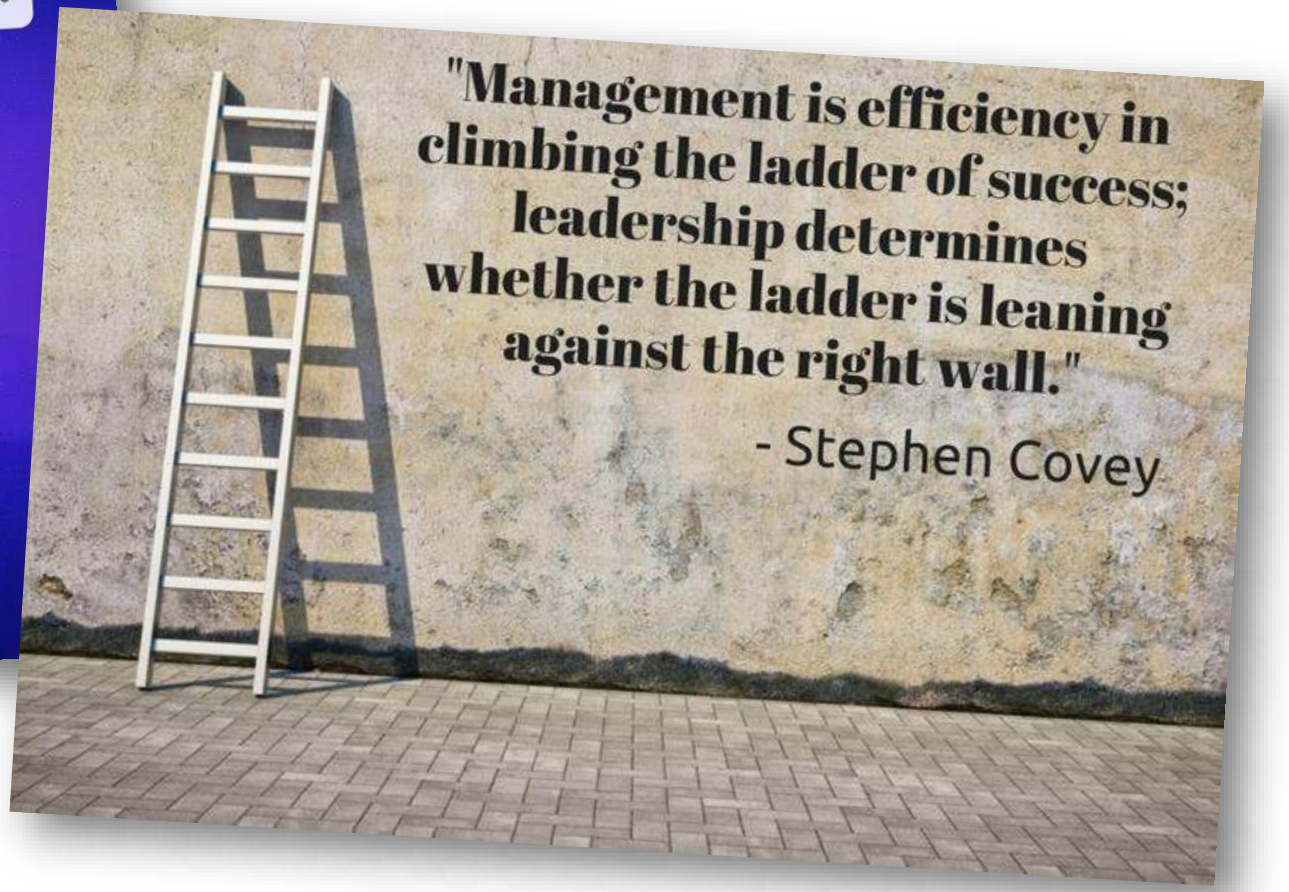


«Ask me anything»: la differenza tra la scala e il muro



FORSE PENSAVATE CHE LE COMPAGNIE ASSICURATIVE POTESSERO FARE A MENO DEGLI «AGENTI»…

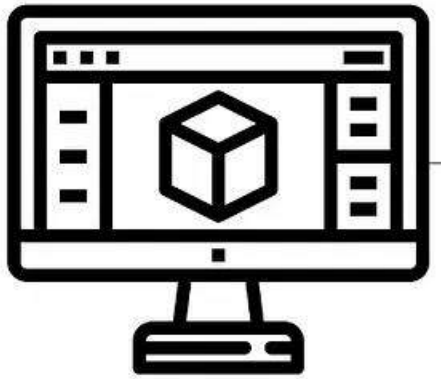
Un **agente** è tutto ciò che può percepire il suo ambiente attraverso **sensori** e agisce su quell'ambiente attraverso **effettori/attuatori**.

Vengono definiti tre tipi di agenti:

- **Umano**
- **Robotico**
- **Software**

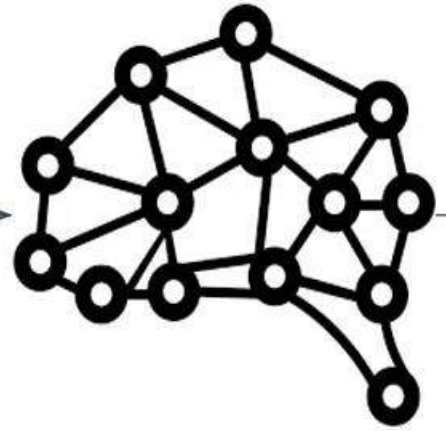
AI AGENTS - FROM SOFTWARE TO AUTONOMOUS SOFTWARE

Where We Were



Existing Software

Where We Are

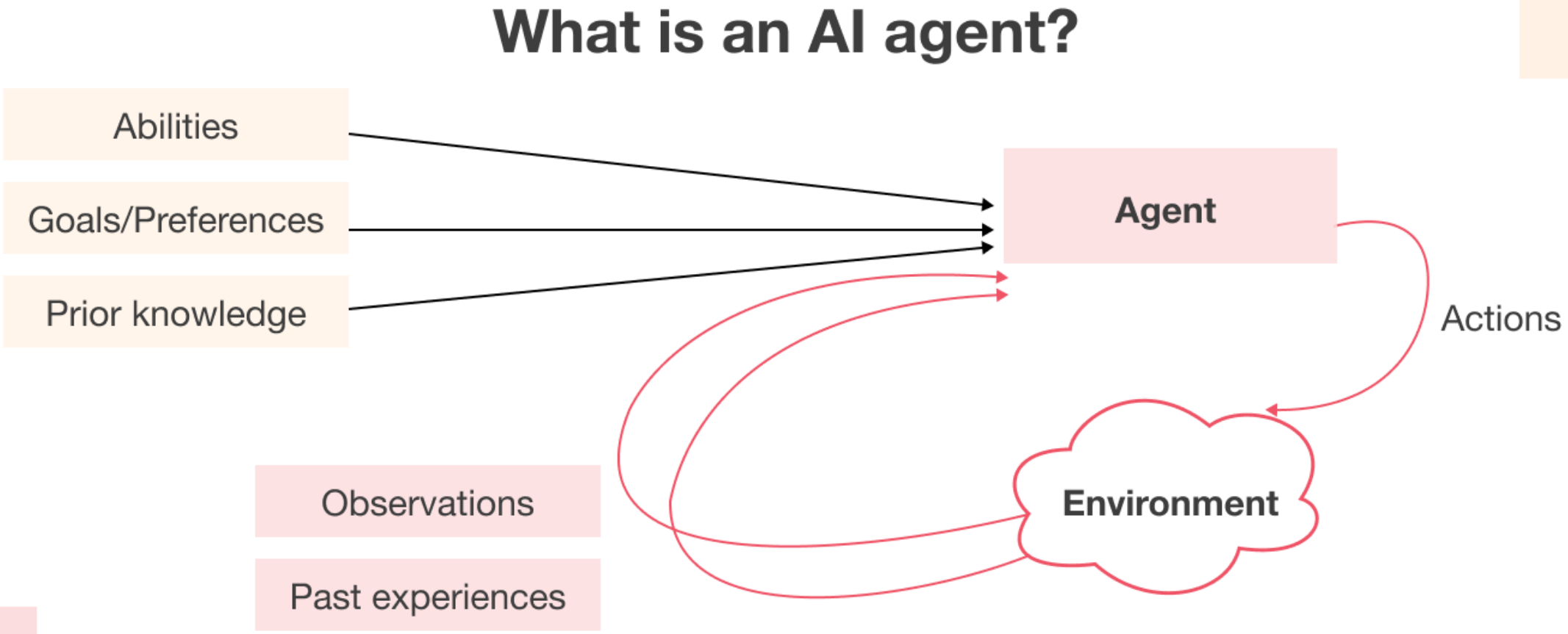


LLMs

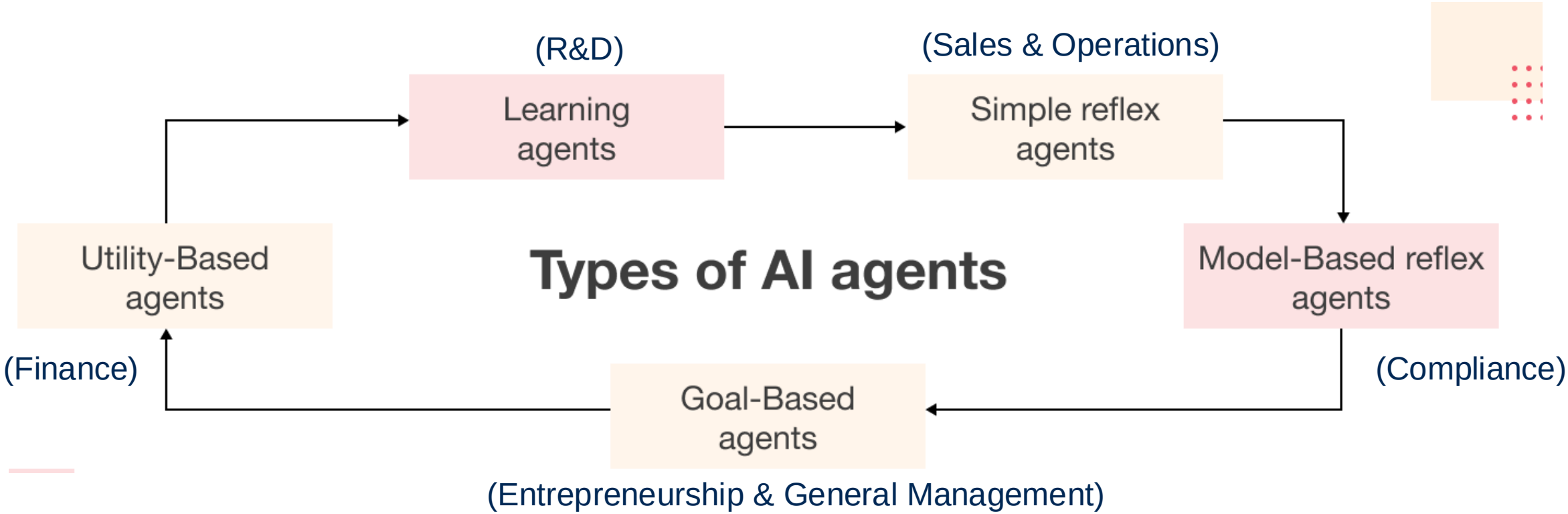
Where We're Going

AI Agents

ARRIVANO GLI «INTELLIGENT AGENTS»…



QUALI SARANNO I DIVERSI TIPI DI «AI AGENTS»?



Cinque tipi principali di agenti AI:

1. **Simple reflex agents** sono programmati per rispondere a specifici stimoli ambientali sulla base di regole predefinite.
2. **Model-based reflex agents** sono agenti reattivi che mantengono un modello interno dell'ambiente e lo utilizzano per prendere decisioni.
3. **Goal-based agents** eseguono un programma per raggiungere obiettivi specifici e intraprendere azioni basate sulla valutazione dello stato attuale dell'ambiente.
4. **Utility-based agents** considerano i potenziali risultati delle loro azioni e scelgono quello che massimizza l'utilità attesa.
5. **Learning agents** eseguono tecniche di machine learning per migliorare il loro processo decisionale nel tempo.

BASTA «ALLUCINAZIONI»: ARRIVA LA «OBJECTIVE-DRIVEN AI»

Lytle Lecture 2023-2024

NEW YORK UNIVERSITY Meta AI

Objective-Driven AI

Towards AI systems that can learn,
remember, reason, plan,
have common sense,
yet are steerable and safe

Yann LeCun
New York University
Meta – Fundamental AI Research

University of Washington
Lytle Lecture
2024-01-24

Arriva l'Intelligenza Artificiale Generativa. Quali impatti avrà sul personale di banche e assicurazioni?

«AI won't replace human professionals, but those who use it will replace those who don't»

Artur Niemczewski, Insurance NED, CEO

La consulenza diventa «bene sociale», non mera gestione del denaro

La finanza è finalmente percepita come la soluzione e non il problema. Questa attesa di supporto e la disponibilità ad una alleanza «famiglie-risparmio finanza/consulenza» per dare un futuro ed un progetto al paese deve essere valorizzata e rapidamente mostrata nei suoi effetti virtuosi.

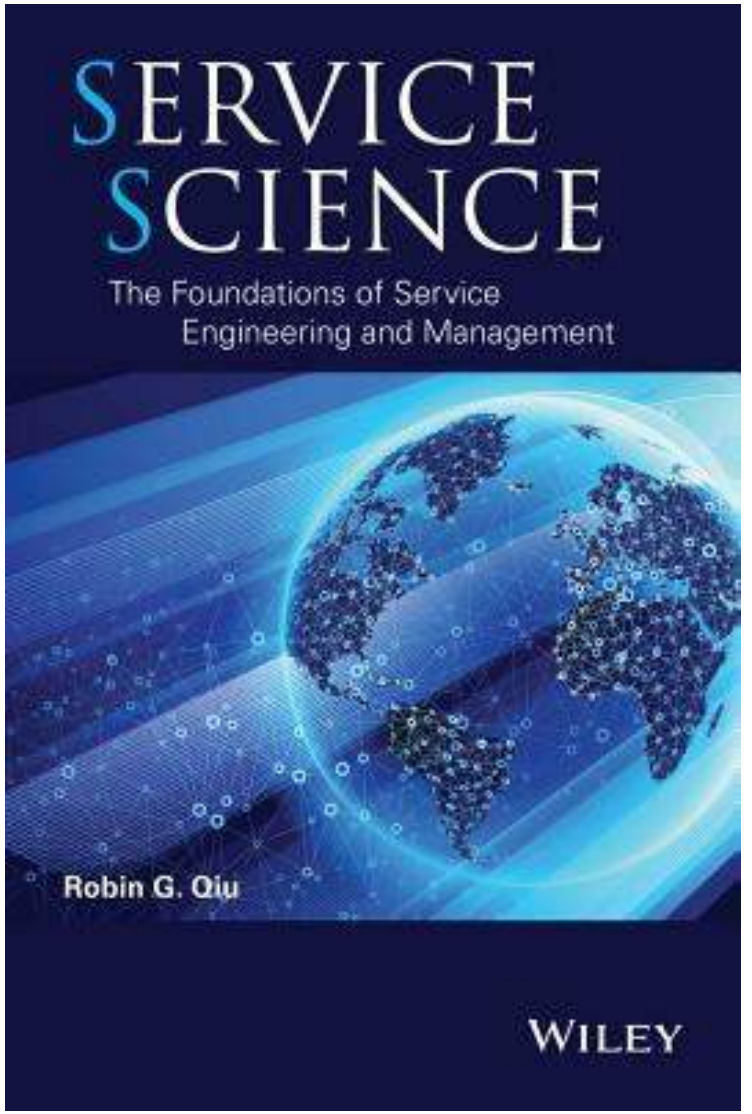
La finestra di opportunità deve essere sfruttata per la valorizzazione del ruolo sociale e concreto dell'Industry: della consulenza, ma anche dell'intera filiera finanziaria, che supporta e rende possibile il ruolo della consulenza stessa.

La sfida professionale: verso la «service science» dell'advisory finanziaria dopo MIFID2

Il servizio di consulenza e protezione finanziaria è diventato una «scienza del servizio»:

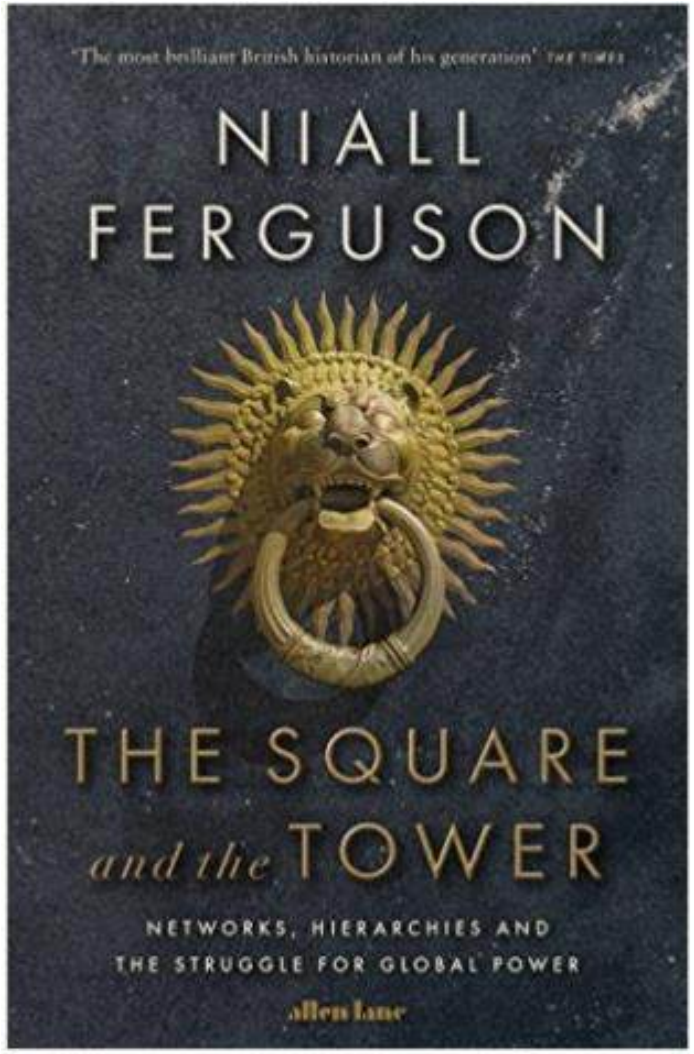
- Dal risparmio al **risparmiatore**
- Dall'offerta alla **domanda**
- Dalla distribuzione e dal risparmio opportunistico in cerca di rendimento, alla **tutela del patrimonio e della continuità**.

La consulenza finanziaria in una banca moderna e sostenibile è piattaforma abilitante di servizio, sensibile alle variazioni dei bisogni e dei comportamenti del cliente, non canale distributivo di un prodotto, senza responsabilità del suo destino.



CONCLUSIONI

La Banca-Torre e la Banca-Piazza.



… a ben guardare, ci sarebbe anche la Banca-Piazzetta…

Sarà necessario invertire la relazione tra consumo e risparmio

Oggi consideriamo il **RISPARMIO** come residuo della quota di reddito dedicata al **CONSUMO**.

Domani dovremo determinare e rispettare la quota di reddito da dedicare all'**INVESTIMENTO**.

La **LIQUIDITA**' non è il residuo del consumo, ma il residuo dell'**INVESTIMENTO**, che è l'unica vero forma di **RISPARMIO**.

Il salvadanaio dei ricordi


“Smetti di contare le monete
di Cesare. Vieni e seguimi…”

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SDA Bocconi
SCHOOL OF MANAGEMENT

Grazie!

Arrivederci…

Prof. CarloAlberto Carnevale-Maffè

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