BBVA Research

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IOSCO Roundtable 2025

Emerging Risks in Capital Markets

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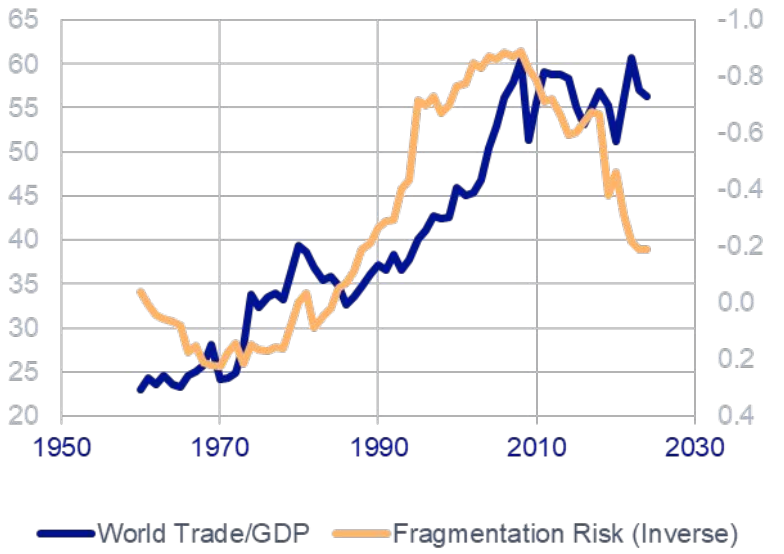
Introduction

The Global Economy in a Changing World

Global trade headwinds amid intensifying geopolitical tensions …

WORLD TRADE OVER GDP
(%)

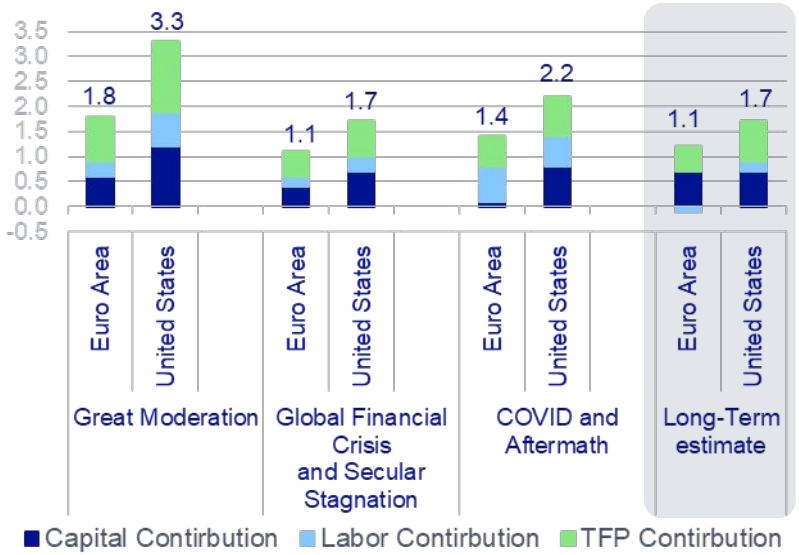


- **Rising Fragmentation:**
  Increasing geopolitical tensions and protectionist policies are eroding multilateralism, shifting the world toward a “two-block equilibrium” (U.S./EU vs. China/Global South).
- **Trade Headwinds:**
  Global trade growth has slowed significantly since 2012, well below the pre-GFC trajectory. Tariff barriers, supply-chain reshoring, and export controls (tech, energy, food) are adding to frictions.
- **Fragile Order:**
  Declining institutional quality and the rise of interventionist/populist policies reduce trust in the rules-based global order, increasing uncertainty for investors and regulators.
- **Macro Consequences:**
  Trade fragmentation simulations suggest global GDP losses of 1–3% in the medium term. In this new environment, **more frequent shocks are likely, with supply shocks playing a greater role** in shaping volatility and inflation dynamics.

* See paper for a detailed explanation
Source: BBVA Research

… in a time of lower potential growth in many regions

GDP GROWTH AND COMPONENTS
(% ANNUALIZED)



Drivers

- Global trade headwinds amid intensifying geopolitical tensions
- Interventionism, populism, and the erosion of liberal institutional frameworks
- Strains on the current global financial architecture
- Escalating policy challenges in a fragmented world economy
- Potential shifts in the inflation regime
- Climate change as a systemic risk amplifier

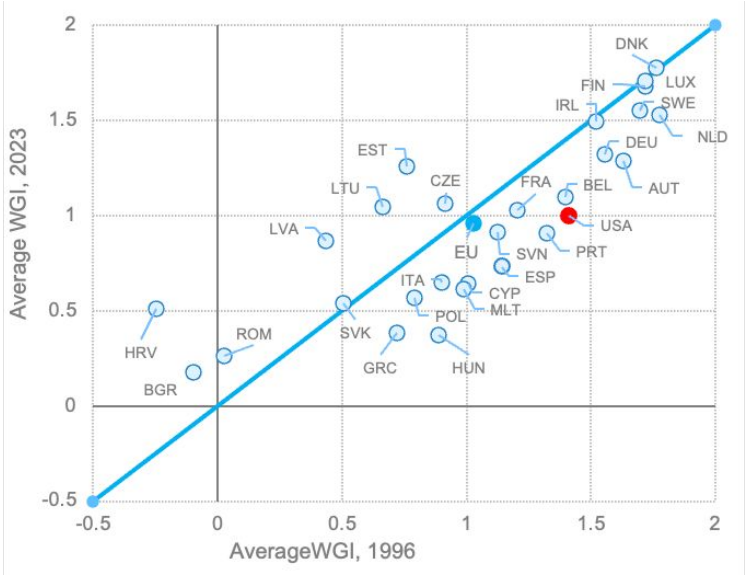
and importantly ….

- Aging, immigration and falling demographic bonus
- Technology Disruptions: AI and quantum computing.

Source: BBVA Research

Interventionism, populism, and the erosion of liberal institutional frameworks

AVERAGE OF WORLD GOVERNANCE INDICATORS, 2023 vs 1996



Source: BBVA Research based on World Governance Indicators (2024)

- **Global Institutional Decline:**
  Since the mid-1990s, governance quality has weakened in many advanced economies. The U.S., once near the top of governance rankings, has converged to the EU.
- **Populism as a Driver:**
  Populist movements erode democratic checks and balances, reduce press freedom, weaken judicial independence, and lead to lower per capita growth (around 10% lower after 15 years, Funke et al., 2023).
- **Risks to Central Bank Independence**
  Attacks on monetary authorities' autonomy undermine credibility, threaten inflation-expectation anchoring, and increase volatility in bond and currency markets.
- **Economic Implications:**
  Strong institutions promote private investment, innovation, and human capital. Weak institutions raise uncertainty, deter investment, and reduce the growth. In this more interventionist environment, **industrial policy is regaining prominence**, with governments more actively steering capital and strategic sectors, adding both opportunities and new distortions.
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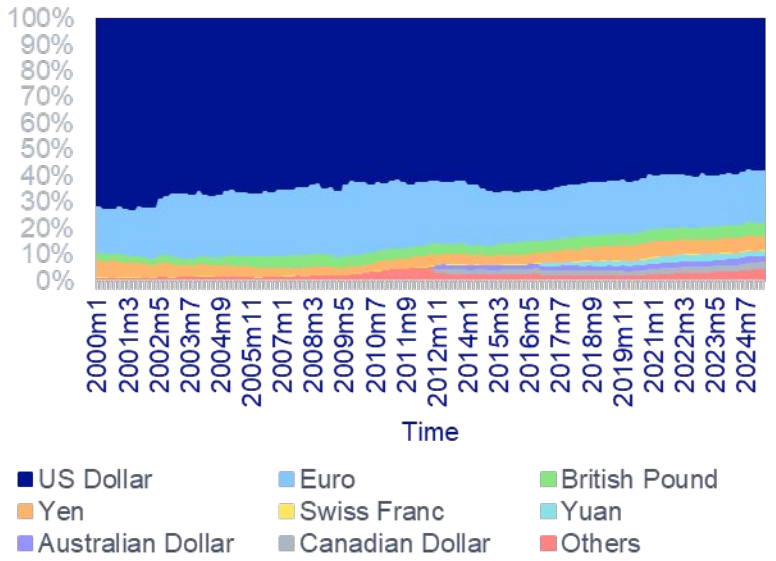
Strains on the current U.S. dollar–based global financial architecture

CENTRAL BANKS´ INTERNATIONAL RESERVES
(BY CURRENCY DENOMINATION, % OF TOTAL)

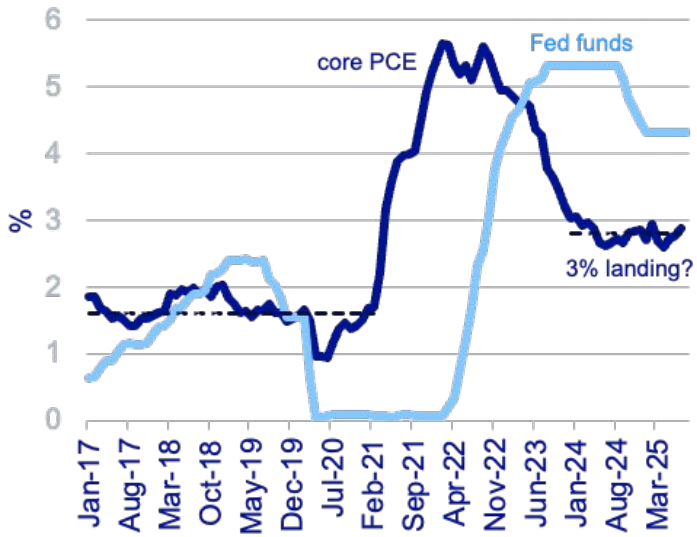


- **Geopolitical fragmentation** undermines the efficient allocation of capital by eroding rule-based multilateralism and increasing transaction costs.
- **Potential resurgence of capital controls** reflects a shift away from decades of financial liberalization, raising concerns about market segmentation and welfare losses.
- **Technological disruption** from CBDCs, stablecoins, and digital assets introduces uncertainty regarding monetary sovereignty, cross-border capital flows, and systemic risk.
- **Liquidity fragmentation and financial weaponization** highlight the fragility of global payment networks, especially where swap lines and settlement mechanisms become tools of statecraft.
- **Erosion of dollar hegemony** may lead to a transition toward a multipolar currency system, with unclear implications for stability, seigniorage, and global liquidity provision.
- **Diminishing supply of safe assets,** particularly U.S. Treasuries, challenges models of global savings allocation and could raise risk premia across markets.

Source: COFER database

Potential shifts in the inflation regime

US INFLATION (CORE PCE) AND FED FUNDS RATE (%)



Source: BBVA Research based on FRED.

- **From Disinflation to Mild Inflationary Bias:** After decades of globalization, cheap labor, and stable commodity prices keeping inflation low, structural forces are now tilting toward higher, more persistent inflation. Central banks, fiscal policy, and institutional credibility remain the decisive factors a regime shift.

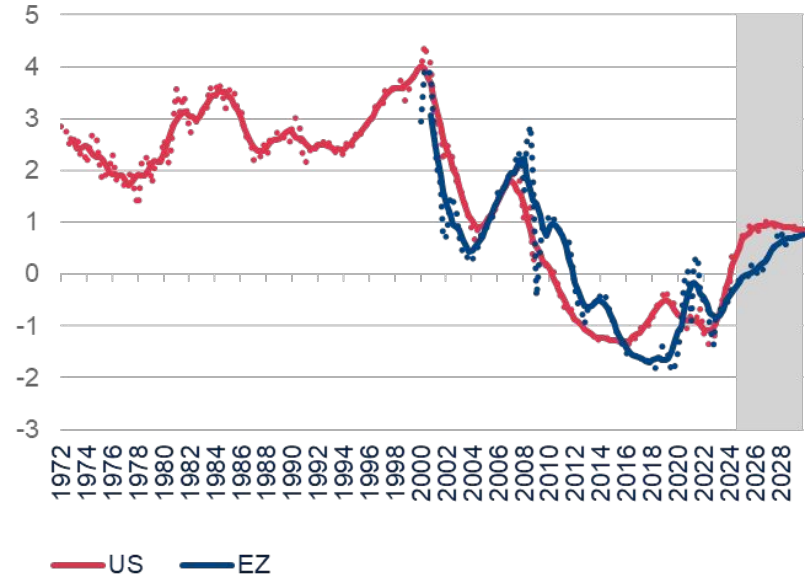
- **Multiple Drivers:** Populism, supply-chain fragmentation, climate transition costs, and fiscal pressures are interacting with structural changes highlighted by Goodhart & Pradhan (2020): aging societies, shrinking workforces, and shifting global savings patterns.

- **Demographic U-Curve Effect:** Population aging contributes to a U-shaped relationship with inflation: disinflationary when working-age cohorts are large, inflationary as dependency ratios rise.

- **Policy Implications:** Central banks may face higher neutral interest rates (r*) and reduced policy space, complicating the balance between growth and price stability.

Escalating policy challenges in a fragmented world economy

BBVA RESEARCH ESTIMATES OF R* FOR THE US AND EZ (%)



- **Higher Neutral Rates (r*):**
  Structural forces—aging populations, climate investment, and rising public debt—are pushing up equilibrium interest rates, with implications for growth and debt sustainability.

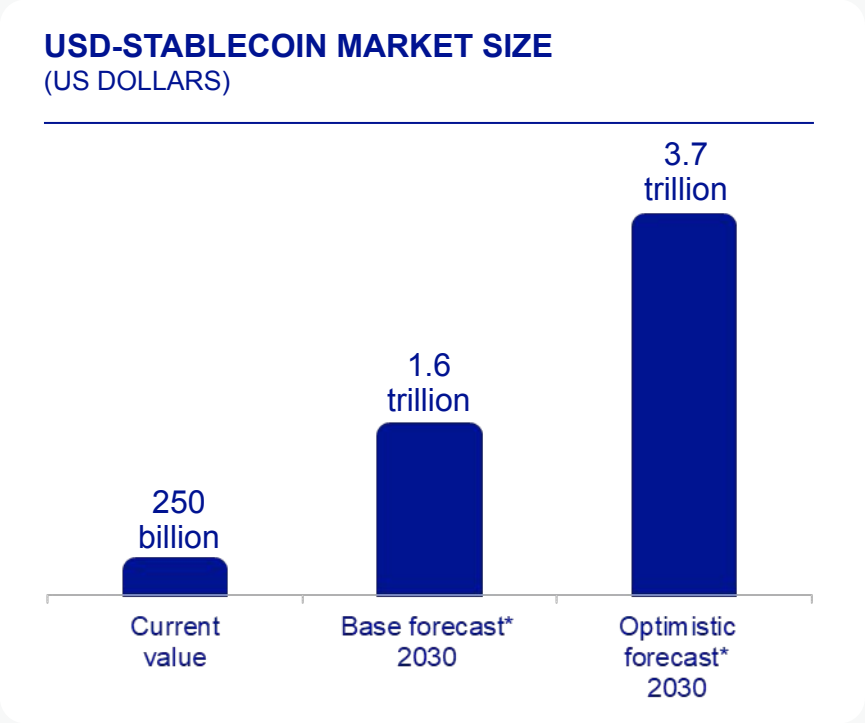
- **Fiscal Dominance Risks:**
  Elevated public debt ratios and persistent deficits in times of new fiscal needs (defense & ageing, among others) raise the risk of fiscal dominance, constraining central banks' independence and complicating inflation control.

- **Global Reserve Currency Pressures:**
  The dominance of the U.S. dollar faces new pressures from shifting trade blocs, sanctions use, and the rise of central bank digital currencies (CBDCs).

- **Fragmented Policy Coordination:**
  Diverging policies across major economies weaken global financial stability and increase volatility.

Source: BBVA Research

Stablecoins: Financial Risks Emerging

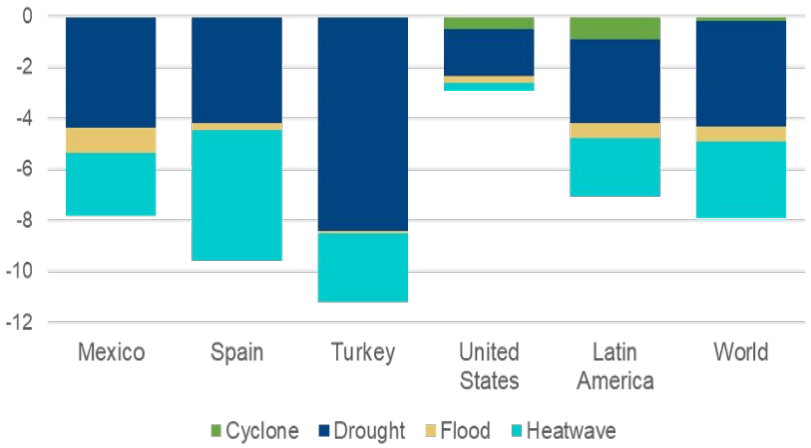


- **Fragility & Runs:** Despite reserve-backing, stablecoins can depeg under stress (e.g. TerraUSD, SVB case).
- **Banking System Pressure:** Potential migration of deposits to stablecoins could destabilize funding and credit intermediation.
- **Treasury & Liquidity Shocks:** Mass redemptions may force issuers to sell Treasuries abruptly, amplifying volatility.
- **Moral Hazard & Bailout Risk:** Tirole warns that retail perception of “safe deposits” could pressure governments into costly rescues.
- **Dollarization & Sovereignty Loss:** Widespread adoption of USD stablecoins may erode monetary autonomy, especially in emerging markets.
- **Regulatory Gap:** Oversight still patchy; risks of arbitrage and misconduct remain high

Source: Citi

Climate change as a systemic risk amplifier

2050 GDP IMPACT: CLIMATE HAZARDS
(Current Policies vs. No Climate Change Baseline)



- **Rising Physical Risks:**
  Climate change increases the frequency and severity of extreme weather events, threatening infrastructure, supply chains, and long-term growth potential.

- **Macroeconomic Impacts:**
  Under current policies, global GDP could be reduced by up to several percentage points by 2050, with uneven effects across regions and sectors.

- **Sectoral Vulnerabilities:**
  Tourism, agriculture, and coastal economies face heightened risks from heat stress, water scarcity, and sea-level rise. Spain provides a case study of how tourism demand shifts under climate stress.

- **Adaptation & Transition Costs:**
  Investment in resilience, mitigation, and energy transition is essential, but entails significant upfront fiscal and economic costs.

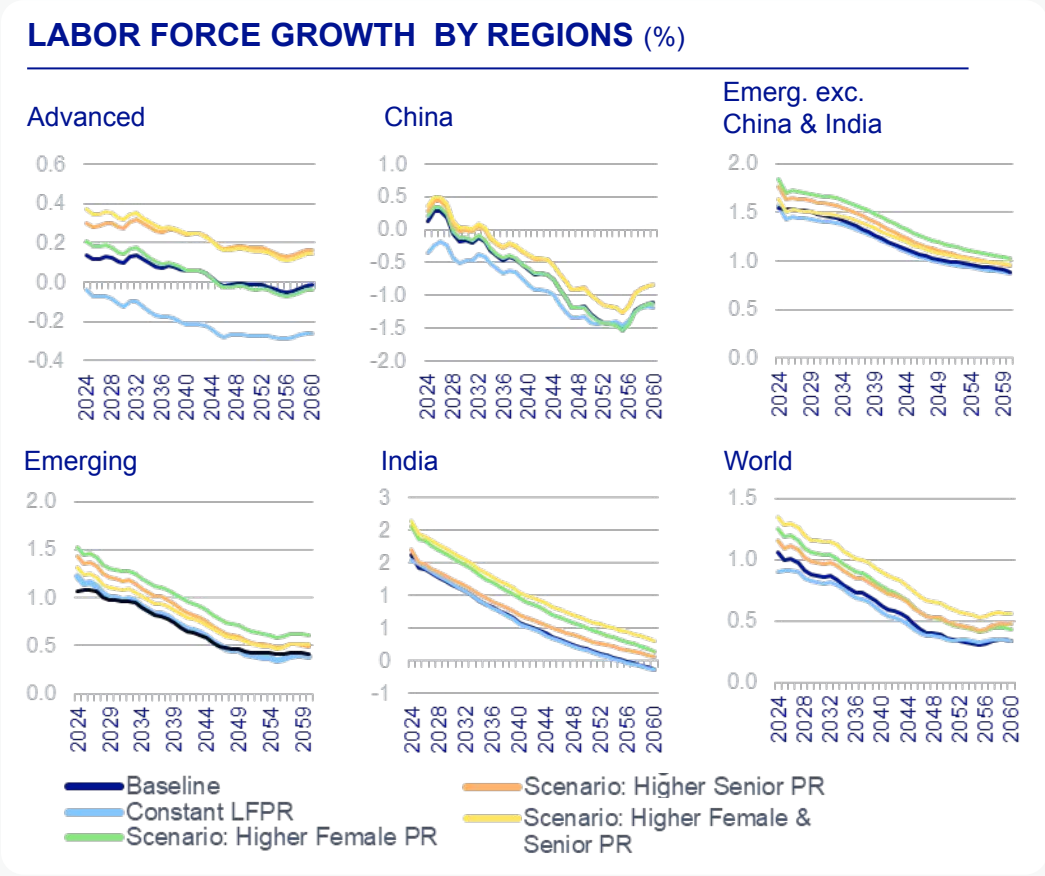
Source: BBVA Research based on NGFS Phase IV.
The displayed results correspond to damages using the 80th percentile of the modeling results, with the 100th percentile representing the most severe impact. NGFS has not yet released the impact with the median, which would be more logical, and provides impacts with high percentiles, amplifying the damage

Key Theme 1:

Aging, immigration and falling demographic bonus

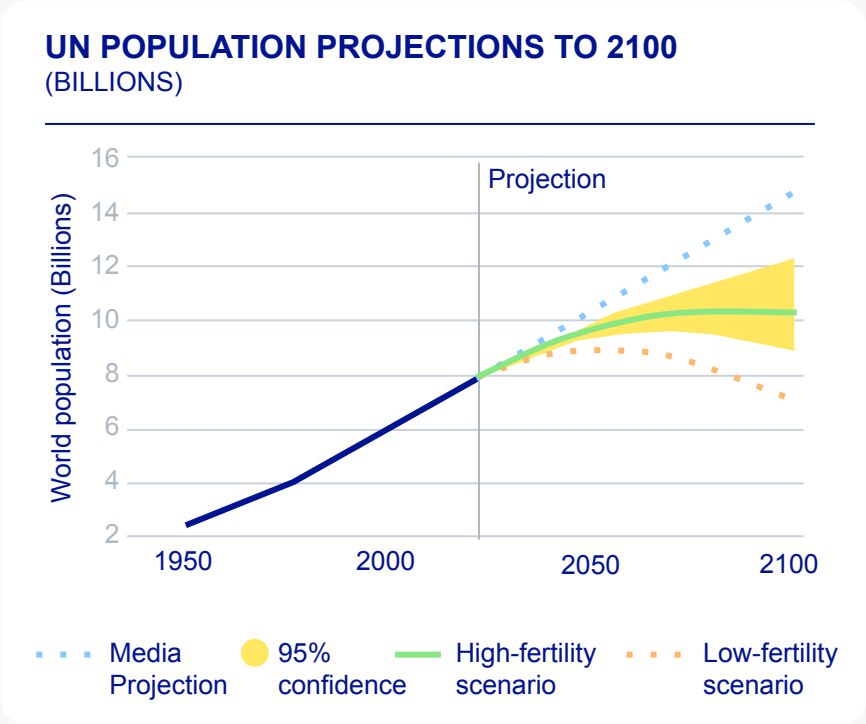
Demographic Shifts and Their Impact on Capital Markets

- **Global Turning Point:** global population down by 2050 and rising dependency ratios.
- **Growth & Productivity at Risk:** Shrinking working-age populations and weaker innovation.
- **Fiscal Sustainability Pressures:** Pension and healthcare spending projected to rise by +7–14 pp of GDP by 2050, affecting intergenerational equity.
- **Policy Effectiveness Eroded:** Effects on the natural interest rate, inflation, and fiscal multipliers, while older electorates resist reforms.
- **Wealth & Generational Inequalities:** Households aged 55+ represent ~30% of the population but hold ~70% of total wealth. Younger cohorts face housing and income constraints.
- **Financial System Transformation**: demographic aging shifts savings toward safer assets, exports excess capital abroad, and compels banks to transform their business models, while fintech accelerates both opportunities and systemic risks.
- **Real estate, demographics and capital market spillovers**



Source: BBVA Research

The Global Demographic Turning Point



- **Fertility Collapse:**
  Global Fertility Rate (TFR) has fallen below replacement level (<2.1): population decline projected by 2055 (Fernández-Villaverde, 2025).

- **Rising Dependency Ratios:**
  Both advanced economies (AEs) and emerging markets (EMs) face higher old-age dependency, putting pressure on labor markets and social systems.

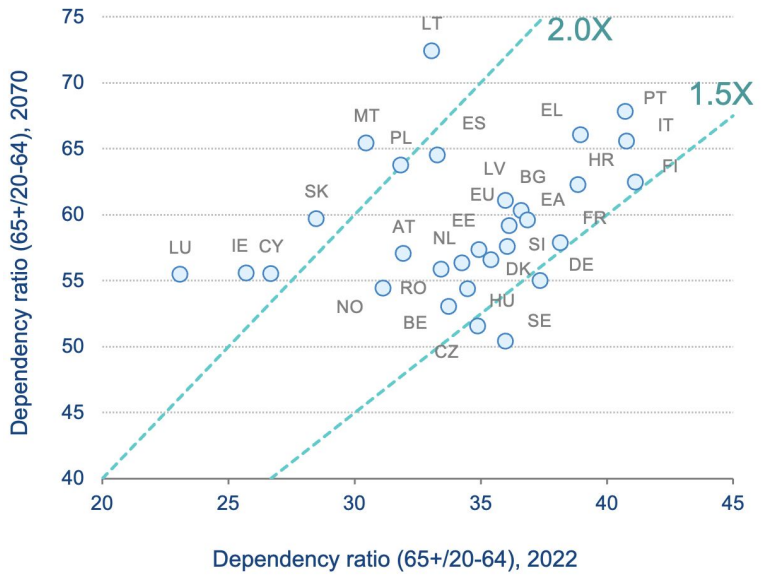
- **Uneven Regional Dynamics:**
  Some regions (Sub-Saharan Africa, South Asia) still contribute positively to global population growth.Others (Europe, East Asia) are already in demographic decline.

- **Macro & Policy Consequences:**
  Shrinking working-age populations constrain growth potential, raise fiscal sustainability concerns, and heighten the urgency of immigration, productivity gains, and human capital investment.

Source: BBVA Research based on UN (2022)

Demographics & Generational Shifts

DEPENDENCY RATIOS IN EU
2070 vs. 2022



- **Fertility Collapse & Global Ageing:**
  Low fertility rates below replacement and rising life expectancy are driving a rapid increase in the share of elderly populations.

- **Fiscal Sustainability Pressures:**
  Pension and healthcare spending are projected to rise by +5–12 pp of GDP by 2050, challenging fiscal balances and intergenerational equity.

- **Policy Effectiveness at Risk:**
  Ageing electorates tend to resist structural reforms, while shrinking labor forces weaken growth potential.

- **Generational Inequalities:**
  Trillions in wealth will transfer to older generations (50+), while younger cohorts face housing affordability challenges, precarious labor markets, and demand for ESG/digital-first financial products.

Source: BBVA Research based on European Commission (2024)

Implications for Growth & Productivity

DEMOGRAPHICS CONTRIBUTION TO GDP GROWTH

- **Lower Labor Supply:**
  Shrinking working-age populations constrain employment growth and reduce the productive capacity.

- **Innovation Slowdown:**
  Aging societies may reduce entrepreneurial dynamism, risk-taking, and innovation, weakening productivity gains.

- **Potential Output at Risk:**
  Without compensating factors (migration, digital transformation, human capital investment), advanced economies risk long-term stagnation.

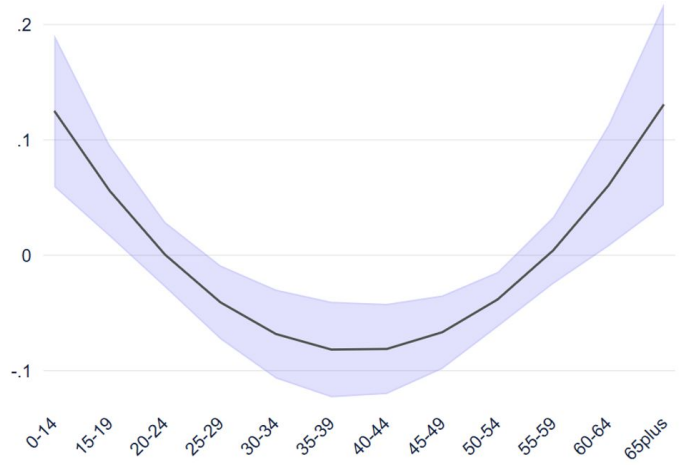
- **Japanization Risk:**
  Persistent low growth, low inflation, and high debt burdens could replicate the Japanese experience, with spillover risks for global markets.

Source: BBVA Research “The macroeconomic impact of ageing” (2023).

Demographics, Automation & Supply Chains: Net Impact on Inflation

CONTRIBUTION OF GROUPS AGES TO INFLATION IN ADVANCED ECONOMIES

PANEL MODEL FOR INFLATION:
14 GROUPS, 2ND DEGREE POLYNOMIAL

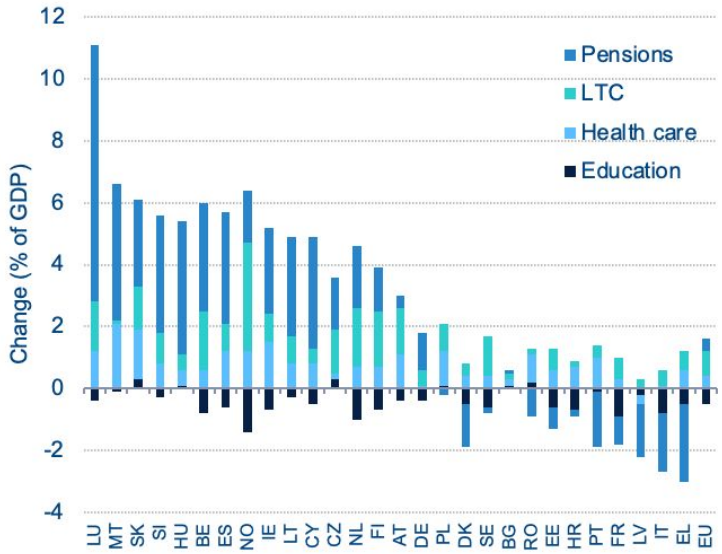


- **Demographic U-Curve**: Younger and older cohorts contribute to higher inflation; middle-aged groups exert disinflationary effects.
- **Aging & Labor Shortages**: Shrinking workforces raise wage pressures, disrupt supply chains, and push costs higher.
- **Automation as Offset**: AI, robotics, and digitalization mitigate inflation by boosting productivity and reducing labor intensity.
- **Supply Chain Realignment**: Deglobalization + reshoring amplify cost pressures, especially in goods trade and critical inputs.
- **Net Effect**: Persistent, moderate inflationary bias in advanced economies (as in Goodhart and Pradhan, 2020). Digital transition, AI and automation can mitigate these effects.

Source: BBVA Research own estimates, “The macroeconomic impact of ageing” (2023)

Bond Market Implications of Demographic Fiscal Pressures

EXPECTED INCREASE OF PUBLIC SPENDING ON PENSIONS, HEALTH AND LTC (GDP pp)

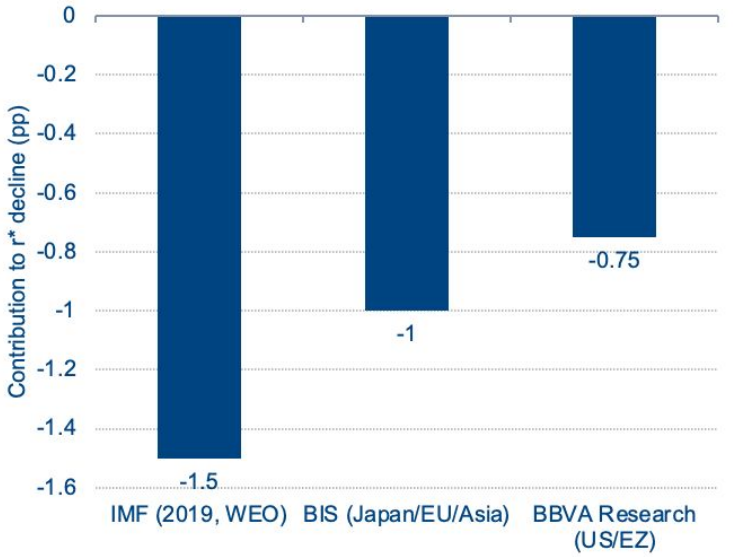


Source: BBVA Research based on European Commission (2024)

- **Rising Pension Costs:**
  Pension expenditure projected to increase by +5–12 pp of GDP by 2050 in advanced economies, driven by aging populations and shrinking workforces.
- **Healthcare & Long-Term Care (LTC):**
  Additional +2 pp expected from healthcare and LTC.
- **Debt Sustainability Risks:**
  Higher age-related spending combined with already elevated public debt levels limits fiscal policy space.
- **Intergenerational Equity:**
  Without reforms, younger generations face higher tax burdens and reduced fiscal room for investment.
- **Debt Sustainability Stress**: Higher debt burdens raise sovereign risk premia. Fiscal dominance may push neutral rates (r*) upward.
- **Market Spillovers**: Elevated sovereign yields crowd out private investment, amplifying macro volatility and global capital market instability.

Ageing and Policy Effectiveness

ESTIMATED IMPACT OF DEMOGRAPHICS ON NATURAL INTEREST RATES (r*)



- **Monetary Policy Constraints:**
  Ageing demographics lower the natural rate of interest, r* (e.g., Carvalho et al., 2025), weaken inflation dynamics, and reduce the effectiveness of traditional monetary tools.

- **Fiscal Policy Challenges:**
  Shrinking tax bases and slower growth erode fiscal multipliers, while rising age-related spending reduces space for public investment.

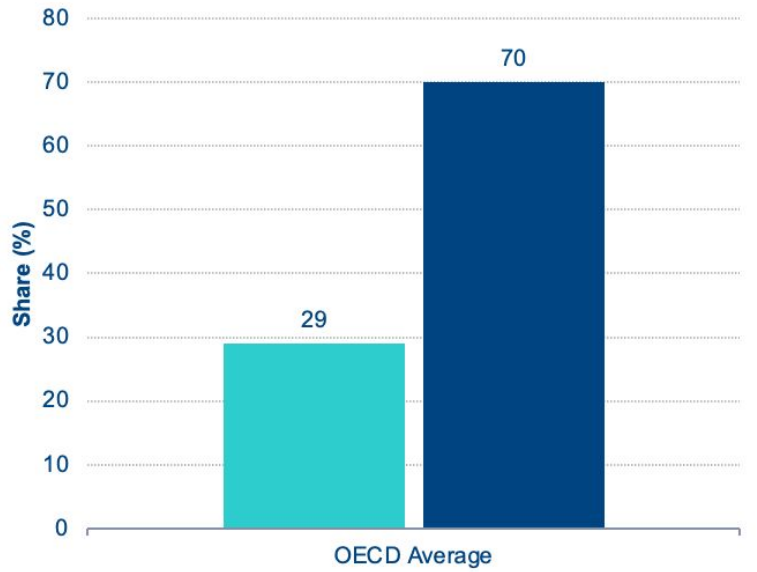
- **Political Economy Pressures:**
  Older electorates, who hold most of the wealth and political influence, tend to resist structural reforms, making policy adjustments slower and more difficult.

- **Systemic Risks:**
  The combination of ageing, fiscal stress and weaker policy tools increases vulnerability to shocks, requiring proactive reforms and innovation in policies.

Source: BBVA Research based on IMF, BIS and own estimates.

Wealth Transfer & Generational Inequalities

POPULATION vs. WEALTH SHARE
(AGED 55+)



- **Society of Heirs:**
  Trillions of dollars in intergenerational transfers are reshaping wealth distribution, with inheritance playing a larger role than earned income.

- **Wealth Concentration:**
  Around **70% of total wealth is held by individuals aged 50+**, reinforcing generational divides in access to assets, housing, and capital markets.

- **Generational Gaps:**
  Younger cohorts face stagnant wages, high housing costs, and limited access to wealth accumulation, deepening intergenerational inequality.

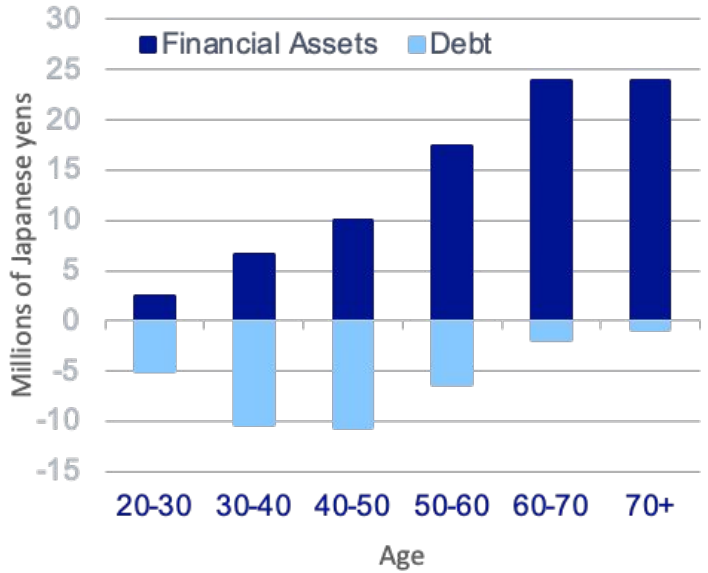
- **Shifting Investment Preferences:**
  Millennials and Gen Z demand **ESG-aligned, digital-first investment solutions,** accelerating financial innovation and reshaping market dynamics.

-

Source: BBVA Research based on population share (55+): 2022–2023 (OECD/UN WPP) and Wealth share (55+): 2021–2023 (OECD Wealth DB, harmonized survey data)

Aging, Savings Flows, and Financial System Transformation

FINANCIAL ASSETS AND DEBT OF JAPANESE HOUSEHOLDS (age groups in 2016)

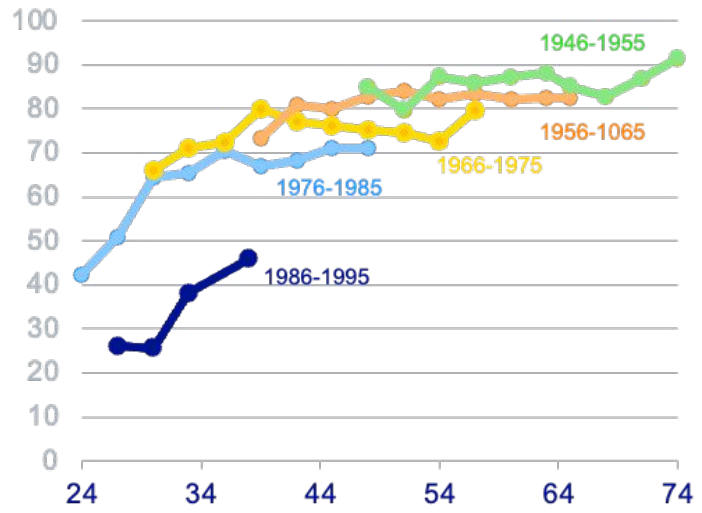


Source: Family Saving Survey and IMF calculations, IMF (2017).

- **Life-Cycle Shift**: Younger households accumulate debt, while older households build financial assets, reinforcing savings over investment.
- **Lower Risk Appetite**: Aging populations rebalance portfolios toward safer assets, compressing returns and reducing credit demand.
- **International Flows**: Excess savings flow abroad (Japan as case), lowering profitability of national projects and increasing banks' foreign exposures.
- **Banking Model Transformation**: Reduced maturity transformation pushes banks toward securities, international lending, or fintech, stabilizing averages but raising tail risks if higher returns are sought.
- **Fintech & Systemic Effects**: Digital rails and new technologies reshape intermediation, amplifying opportunities but also risks of financial system stressed by demographic trends (Imam and Christian Schmieder, 2024).

Real Estate Demographics and Capital Market Spillovers

HOMEOWNERSHIP: DIFFERENCES ACROSS GENERATIONS (AGED 24-74)



Source: Bank of Spain (2025)

- **Generational Housing Divide**: Younger cohorts face declining affordability, while older cohorts concentrate ownership and housing wealth.
- **Demand Shifts**: Aging societies tilt real estate demand toward senior housing, healthcare facilities, and lower-mobility urban housing.
- **Capital Market Transmission**: Housing demand shifts affect MBS issuance, REIT valuations, and bank mortgage lending, transmitting demographic pressures into bond and equity markets.
- **Volatility Risks**: demographic-driven demand shocks can cause abrupt corrections in asset prices, magnifying volatility in bank balance sheets and securitized products

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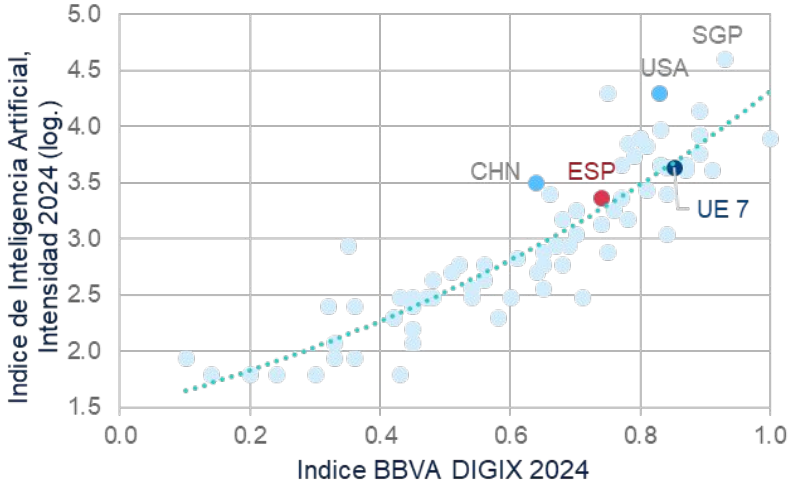
Key Theme 2:

Technology Disruptions: AI & Quantum Computing

Technology Disruptions: AI & quantum computing

BBVA DIGIX AND ARTIFICIAL INTELLIGENCE INDEX (2024)



- **Shift in Value Creation:**
  From energy and industrial drivers of the 20th century to technology-led general-purpose innovations in the 21st century.
- **Beyond digital:** the need to focus on diverse frontiers
  - **AI & Robotics:** GPTs enabling digital and humanoid agents; reshaping productivity, labor markets, and business models.
  - **Quantum Computing:** Potential to accelerate AI and robotics, but dependent on scalability, error correction, and investment.
  - **Blockchain & Decentralization:** Lower transaction costs and new digital ecosystems (crypto, tokenization, DeFi), with potential to transform financial markets.
- **European Positioning:**
  EU has strengths in basic research and regulation, but lags behind U.S. and China in scaling; requires decisive investments and integration to create global champions.

Note: UE7: Austria, Belgium, Denmark, Finland, Germany, Sweden, Netherlands.
Source: BBVA Research based on the European Commission and The Global Artificial Intelligence Index 2024

AI promises to be a General Purpose Technology (GPT)

AI AS A GENERAL PURPOSE TECHNOLOGY (GPT)

AI is not limited to a single sector or function, but can be integrated into a wide range of activities and disciplines

Multiple Sectors

- Healthcare
- Education
- Economy and finance
- Agriculture

Multiple Competencies

- medical diagnosis, drug discovery, medical imaging analysis
- personalization of learning, educational materials
- prediction, analysis, process automation
- resource optimization, monitoring

Multiple Technologies

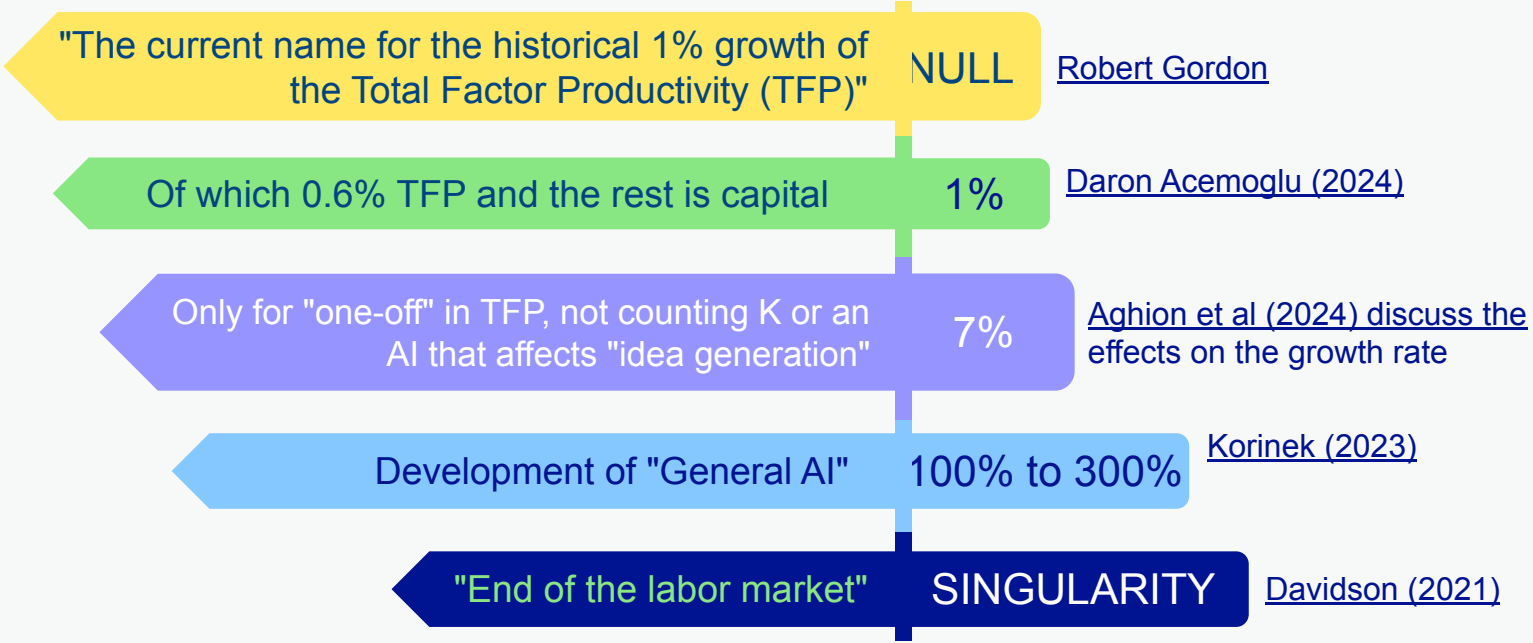
AI is not an isolated technology, but a tool that **can be integrated with other technologies (such as IoT, robotics, biotechnology or augmented reality)** to enhance its capabilities.

Ability to constantly improve: continuous, automatic learning.

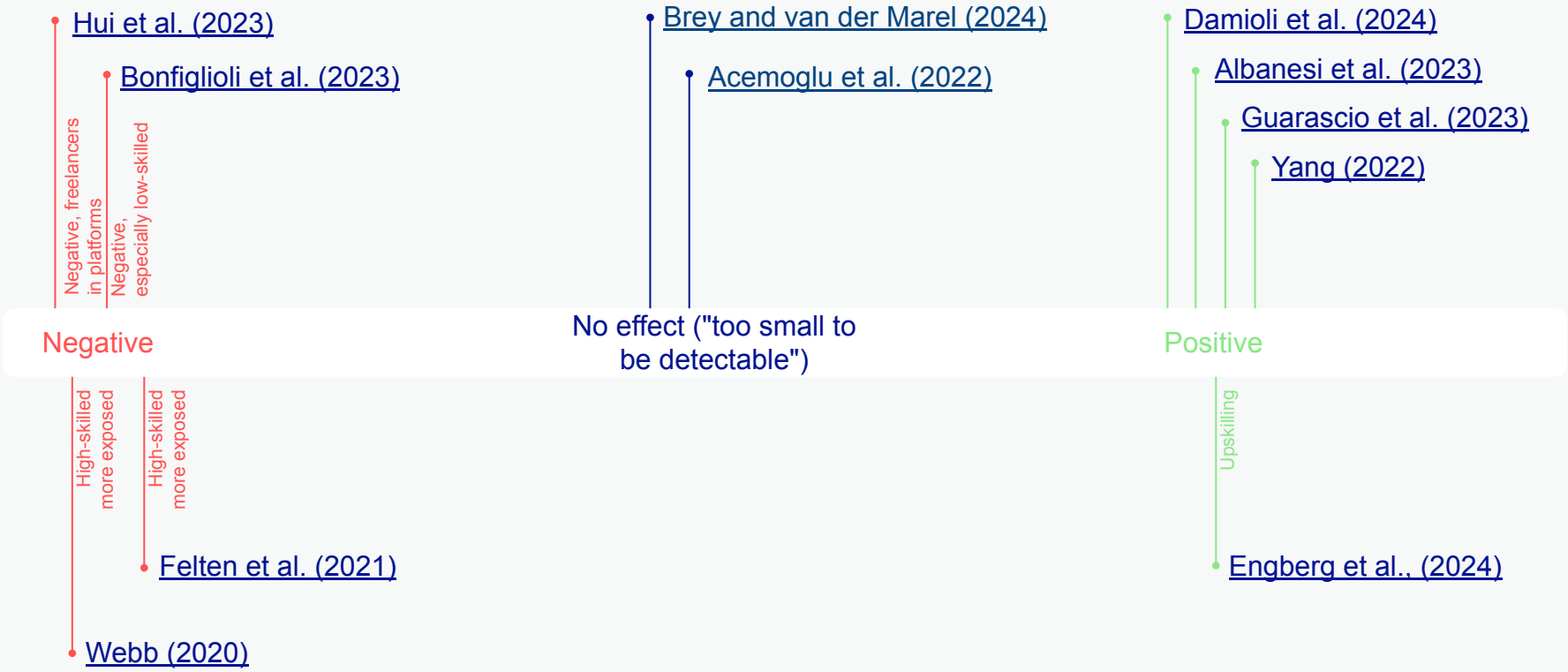
Like other GPTs, **AI has the ability to accelerate innovation, act as an engine of growth and structurally transform economies,** their markets (particularly labor markets), and how resources, productive factors, goods and services are created and distributed.

In the face of such great promises and still little realization, the debate on the economic impact remains extremely open

ADDITIONAL GROWTH EXPECTED FOR THE U.S. ECONOMY
(% ADDITIONAL ACCUMULATED IN THE NEXT 10 YEARS)

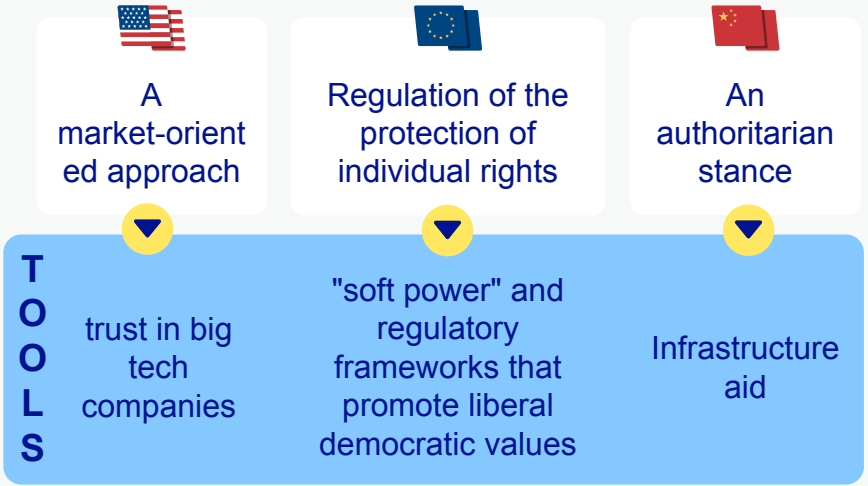


There is also an open debate on the impact of AI on employment



Competing AI global frameworks

THREE DIGITAL BLOCKS IN COMPETITION VYING FOR GLOBAL INFLUENCE
(KEY MESSAGES FROM PROFESSOR BRADFORD)



- Europe's approach is gaining ground among liberal democracies amid a backlash against Big Tech's reputation. Meanwhile, China consolidates its influence in several emerging economies.
- In vertical battles, the West faces the recurring challenge of enacting regulation that is enforceable and compatible with innovation.
- The possible existence of countries not aligned with any of the aforementioned "iblocs" (for example, India), which may constitute a fourth pole of attraction.

Three competing digital empires (US, China, EU)
Impacts on productivity, regulation, market behavior

G7 REPORT: Public Policy Recommendations for the Advancement of AI

THREE ROLES OF GOVERNMENT

1. **Promoting AI**
   (R&D, education, infrastructure and financing)

2. **Promoting AI in government administration**

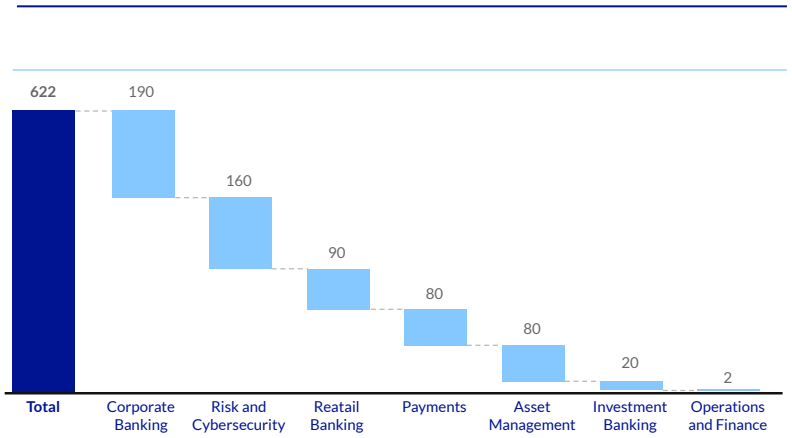
3. **Enactment of laws and regulations** ensuring the objectives of growth, stability, equity and well-being

TEN POLICY STRATEGIES

1. Proactive and flexible policies
2. Trade-off analysis for all policies
   (both technical and incentives)
3. Fostering AI expertise
4. Continuous exploration of new AI capabilities
5. Consistent strategy for public acquisitions of AI tools
6. Adoption of modern government data management tools;
7. Continuous improvement of cybersecurity
8. Creating guidelines for using AI tools
9. Monitoring labor market impact
10. Cross-border cooperation.

Quantum Computing – State of Play

VALUE OF QUANTUM USE CASES IN FINANCIAL SECTOR
(2035, BILLIONS OF USD)



Source: McKinsey & Company

Expectations

- **Cryptography** Breakthroughs enabling unbreakable security via quantum-safe methods.
- **Scientific discovery acceleration**, from drug design to climate modeling.
- **Optimization and AI advances**, solving complex problems in finance, logistics, and machine learning.

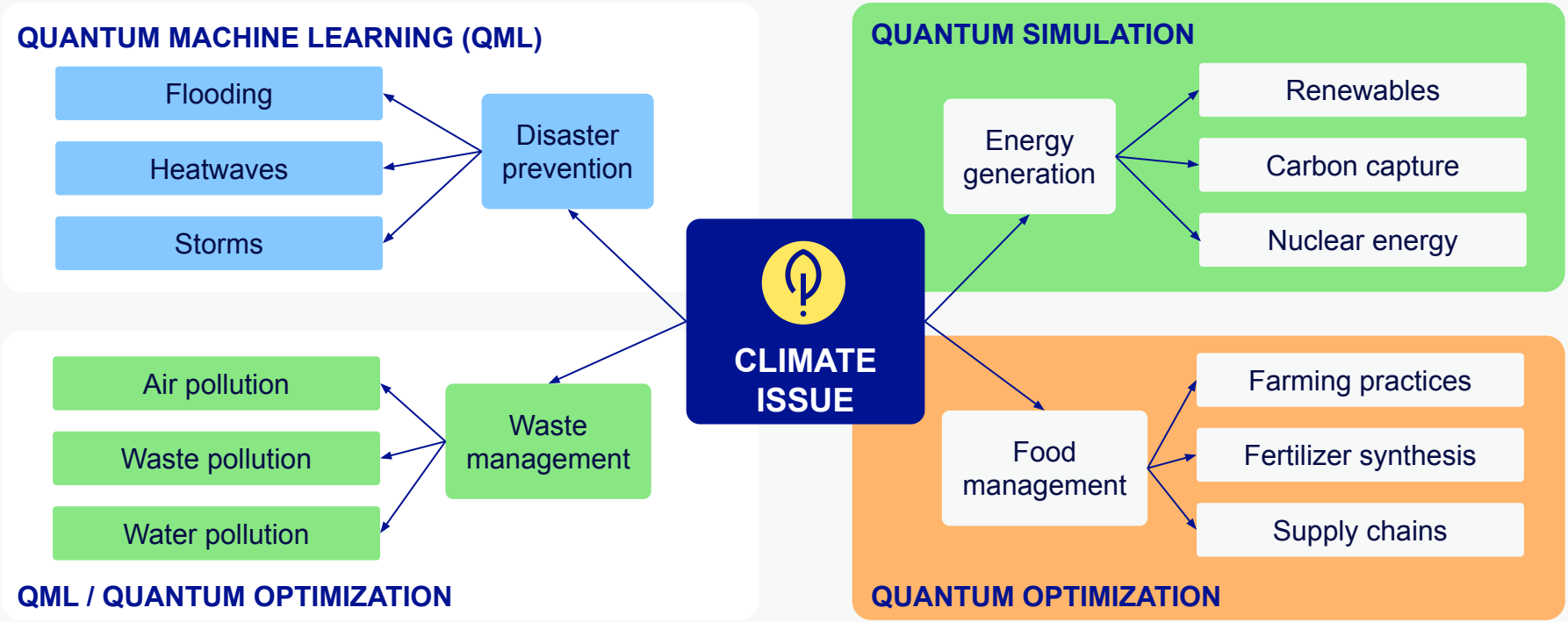
Concerns

- **"Q-Day"** collapse of today's encryption before defenses are ready.
- **Technical and resource hurdles** to maintain scalable machines.
- **Geopolitical and ethical dangers** first-mover advantage could destabilize security, widen inequalities, and monopolize power.

Opportunities in Finance

1. Portfolio Optimization with Quantum Hierarchical Risk Parity
2. Variable Selection
3. Currency Arbitrage
4. Dynamic Portfolio Optimization
5. Quantum Simulation Using Monte Carlo for Derivative Valuation
6. Cash Management with MOVCO-VQE
7. Valuation of Bermudan Swaptions with Tensor Networks
8. Anomaly Detection with Quantum and Quantum-Inspired Algorithms
9. Valuation of Autocallables with Tensor Networks
10. Scaling VQE for Dynamic Portfolio Optimization

Opportunities in Climate



Source: Tung et al. (2024), Quantum Computing for Climate Resilience and Sustainability Challenges

Quantum Risks for Capital Markets

Q-Day definition

The point at which quantum computers can break classical encryption, exposing sensitive data and creating an urgent need for quantum-safe security measures

Impact post Q-Day[1]

- Sensitive data using legacy encryption (including critical private information) becomes vulnerable, leading to potentially large economic and societal disruption
- Organizations and governments face immediate need to implement PQC and QKD to safeguard future operations
- Substantial investments may be made in PQC and QKD to enhance security and prevent data loss

Q-Day drivers

- Breakthrough quantum algorithms that cracks classical encryption standards
- Advances in error-correction techniques that drastically reduce the number of physical qubit needed to create a reliable logical qubit, making large-scale, fault-tolerant quantum computing practical
- Rapid hardware advances delivering stable, high-fidelity quantum system

Source: IIF 'Quantum Readiness

Transition to Quantum-Safe World

A SYSTEMIC ROADMAP TO QUANTUM-READINESS IN THE FINANCIAL SYSTEM

OBTAIN ENGAGEMENT

- Educate stakeholders
- Conduct quantum risk assessments
- Set migration priorities and requirements (eg cryptographic agility)

PLAN

- Align on transition timeline and key technical choices
- Coordinate with global standard and cross-border Financial Market Infrastructures
- Create implementation plans

MONITOR

- Ensure implementation in private and public sectors
- System-level stress, performance test during and after migration

Source: BIS, Migration to post-quantum cryptography

Conclusions

Conclusions

Macro backdrop: slower growth, higher inflation, fragmentation, more uncertainty

Migration: lack of clear-cut policies, risk of populism, and strategy in an aging world

Technology: disruptor & opportunity (AI & QC)

Institutions: direct impact on long-term growth

Demographics: fiscal stress, lower growth, wealth shifts

For regulators: prepare for tectonic & sudden ruptures

Many of these trends **interact in non-linear ways**, amplifying shocks; individually destabilizing, but together **potentially triggering systemic market disruptions**

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