Impact of U.S. Government AI Policies on Investments in the Tech Industry

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INTRODUCTION

Artificial Intelligence (AI) has revolutionized numerous industries and companies in recent years, becoming deeply embedded in their operations. Businesses are increasingly recognizing the commercial value of AI and integrating it into various aspects of their products and services. Notably, from 2023 to 2024, the adoption of generative AI (Gen AI) has seen a significant surge. According to a recent global survey by McKinsey, 65% of respondents indicated that their organizations are using AI technologies, which will bring substantial changes in the coming years (McKinsey).

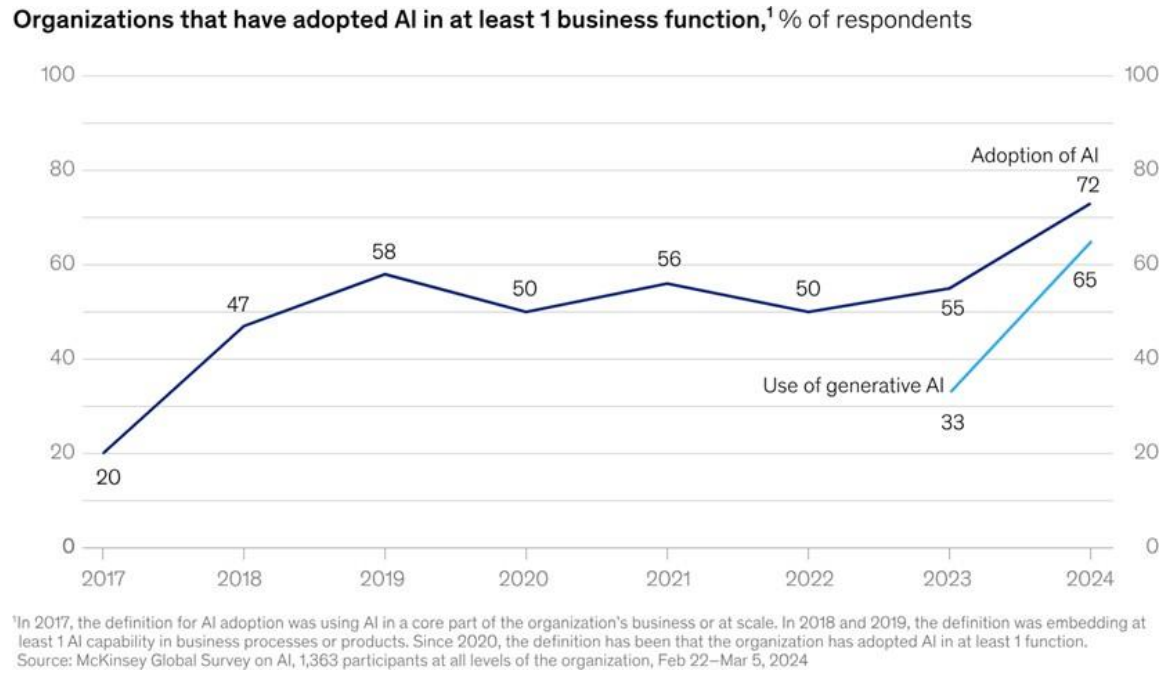

Table1: *Organizations that have adopted AI in at least 1 business function*

Generative AI stands at the forefront of the next wave of productivity enhancements, potentially significantly impacting various industries and reshaping workforce dynamics. This technology drives growth in the high-tech sector, particularly in software development, system optimization, and data management. For instance, generative AI can generate code based on natural language prompts, accelerating software development and improving team efficiency. This reduces development costs and fosters transformative changes in the technology industry.

According to IDC research, global spending on artificial intelligence increased by 19.6% year-over-year in 2022, reaching $432.8 billion. By 2023, spending by governments and businesses on AI technologies is expected to surpass $500 billion(IDC forecasts). This indicates a growing investment and focus on AI from corporate and governmental entities.

As AI technology rapidly advances, governments are increasingly bold in policy and regulatory actions. For instance, the United States and the European Union have begun implementing stricter AI regulations. This trend is expected to continue and accelerate, with governmental oversight and policymaking directly influencing AI investments and development.

In October 2023, President Biden issued a landmark executive order to ensure the U.S. maintains its leadership in AI development while managing the associated risks. The order mandates developers disclose safety test results for their most powerful AI systems and report on large computing clusters used for AI training. Cloud service providers must also report the computing resources they provide to foreign clients for AI training purposes (The White House).

The EU's AI Act establishes a clear regulatory framework for AI technologies, assigning risk levels to various application areas and defining corresponding regulatory requirements. This approach ensures the safe application of AI and minimizes potential risks. In contrast, the AI regulatory roadmap announced by the U.S. in May 2024, while less comprehensive than the EU's legislation, provides a direction for future AI governance. It aims to protect democracy and society from the potential threats posed by AI technologies. Together, these initiatives are driving the responsible development of AI (Forbes).

This paper will delve into the latest advancements in AI technology, focusing on generative AI. It will critically examine the evolving regulatory policies in major economies such as the U.S. and the EU. By analyzing these factors, we will assess how these developments influence investment strategies and opportunities within the technology industry, offering insights into how companies can navigate the balance between innovation and compliance in an increasingly regulated environment to success.

Key Finding

- Generative AI has experienced rapid growth, with investments reaching $25.2 billion in 2023. Advanced systems like OpenAI's GPT-4 and Google's Gemini are now versatile tools handling text, images, and audio.
- AI is projected to boost global GDP by up to 14% by 2030, equivalent to an additional $15.7 trillion. The largest gains are expected in China (26% increase) and North America (14% increase).
- AI enhances productivity by automating routine and complex tasks, assisting employees, and personalizing products and services, leading to significant cost reductions and revenue growth.
- AI is vital in addressing supply chain issues. It enables companies to predict and resolve potential problems, thus improving operational efficiency and adaptability.
- Generative AI is expected to drive substantial industry changes, with 75% of industry leaders anticipating significant or disruptive impacts. Early adopters are seeing notable business gains.
- The 2023 National AI Research and Development Strategic Plan update outlines nine key strategies, including long-term investment in AI research, developing effective human-AI collaboration methods, and addressing ethical, legal, and societal implications.
- Generative AI poses issues like disinformation, security, data privacy, and bias. Policies aim to address these challenges through provisions for identifying synthetic content, enhancing data privacy, and ensuring ethical AI use.
- There is a need to support strategic industry players, develop a comprehensive regulatory framework at the federal level, foster collaboration and international cooperation, implement targeted economic policies to promote AI development, ensure transparency and accountability, and address social and ethical concerns.
- The rivalry between the U.S. and China in AI technology poses significant geopolitical risks. International collaboration and maintaining competitive advantages through continued investments are crucial to mitigate these risks.

The Rapid Advancement and Applications of Generative AI

According to the AI Index Report 2024, Generative AI has experienced explosive growth over the past 18 months, with investments soaring to $25.2 billion in 2023. Advanced systems like OpenAI's GPT-4 and Google's Gemini can now handle text, images, and audio, making them commonly used tools across various sectors. The rise of open-source AI models is significant, with 65.7% of 2023's models being open-source, and AI projects on GitHub have surged to 1.8 million. However, developing these cutting-edge models is becoming increasingly costly, as seen with the high training expenses for systems like GPT-4 and Gemini Ultra (AI Index Report 2024).

The Integration of Automation and Augmented Intelligence

According to PwC's research（PWC）, AI is set to boost global GDP by up to 14% by 2030, equivalent to an additional $15.7 trillion. The largest economic gains are expected in China, with a potential GDP increase of up to 26%, and North America, with a projected 14% rise. These benefits are closely tied to AI's capacity to enhance productivity across various sectors. Generative AI is widely applied in multiple business areas, particularly in marketing and sales, product and service development, and supply chain management. These applications enable companies to reduce costs significantly and increase revenue.

Key Areas Driving AI Boost

1. Productivity Gains

AI enhances productivity by automating both routine and complex tasks. For example, robots and autonomous vehicles can perform various functions, from simple manual tasks to sophisticated cognitive processes, streamlining operations and reducing costs. According to the World Economic Forum, AI can potentially increase labor productivity in developed countries by up to 40% by 2035, driven by advancements in software, hardware, and data collection. These technologies enable AI systems to take over tasks traditionally performed by humans, such as writing, coding, and decision-making, significantly boosting productivity (World Economic Forum).

2. Enhanced Workforce Efficiency

AI technologies, such as virtual assistants and chatbots, assist employees by handling routine tasks and customer inquiries, allowing human employees to focus on more complex issues. These AI tools streamline daily administrative tasks, improving efficiency and

accuracy in customer service. According to the World Economic Forum, virtual assistants using natural language processing (NLP) are becoming more efficient and cost-effective for companies, significantly enhancing customer interactions and operational workflows (World Economic Forum).

3. Improved Supply Chain Management

AI systems continuously learn and adapt, enhancing employees' decision-making capabilities. These systems analyze vast amounts of data to provide insights and recommendations, supporting more precise and efficient decisions. Companies leverage AI and data analytics to predict and resolve potential supply chain problems like stock shortages and transportation delays. AI-driven supply chains offer significant competitive advantages, enabling businesses to operate more efficiently and adapt swiftly to disruptions in the coming years(McKinsey & Company).

4. Personalized Products and Services

AI improves product personalization and quality, allowing consumers to receive products and services that better meet their needs. This personalization drives overall consumer demand growth. For example, Frito-Lay rapidly launched an e-commerce platform during the pandemic, showcasing AI's role in responding quickly to market demands and fostering innovation(FritoLay).

5. Adapting to Market Changes

AI empowers companies to rapidly adapt to shifting market conditions and evolving consumer demands. By analyzing consumer behavior, AI allows businesses to quickly adjust their products and services in response to changes in market demand. AI applications also help companies stay agile and flexible in complex and rapidly changing market environments. AI technologies enable businesses to respond more quickly to new opportunities and challenges, maintaining competitiveness in a fast-paced world(HBR).

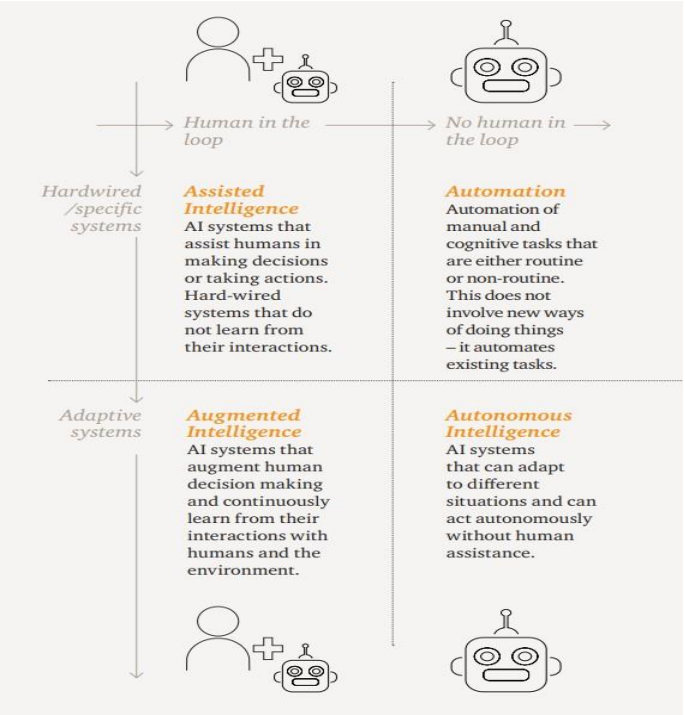

Table2: *Classification of AI Systems by Human Involvement and System Adaptability*

AI's Strategic Importance for Tech Companies

Generative AI is expected to drive substantial industry changes in the coming years. According to McKinsey, 75% of industry leaders anticipate generative AI will significantly or disruptively impact their sectors（McKinsey）. Beyond enhancing current operations, generative AI promises to revolutionize how companies operate and compete, influencing various functions from risk management to supply chain operations.

Early adopters of generative AI are seeing notable business gains, attributing over 10% of their EBIT to AI use. According to McKinsey, these companies also actively manage AI-related risks, such as cybersecurity and compliance, giving them a competitive edge. With 67% of companies planning to increase AI investments in the next three years, generative AI is recognized as a key strategic asset that drives operational efficiency, fosters new business models, and sustains market competitiveness (McKinsey).

For example, ING Bank is an early adopter that has effectively utilized generative AI to enhance customer service operations. By partnering with QuantumBlack AI by McKinsey, ING developed a bespoke customer-facing chatbot. This chatbot uses the latest generative AI technology to improve customer interactions and streamline processes, significantly enhancing operational efficiency and customer satisfaction. Implementing this AI-driven solution has given ING a notable competitive advantage in the banking sector (McKinsey).

Key U.S. Government Policies in AI

In the "2023 Update to the National Artificial Intelligence Research and Development Strategic Plan", the U.S. government outlines nine key strategies to foster continuous innovation and application of AI technology.

1. Long-term Investment in Foundational and Responsible AI Research

- **Core Capabilities**: Focus on AI fundamentals like perception, learning, and reasoning.
- **Usability and Reliability**: Ensure AI technologies are user-friendly and reliable.
- **Risk Management**: Develop strategies to manage risks associated with generative AI.
- **Funding**: The "2022 CHIPS and Science Act" provides substantial support.

Core Insights: Ensures continuous innovation, enhancing tech companies' competitive advantage.

2. Developing Effective Human-AI Collaboration Methods

- **Human-AI Teams**: Improve understanding and efficiency of human-AI collaboration.
- **Team Attributes**: Identify key attributes for successful collaboration.
- **Performance Evaluation**: Create standards to measure AI efficiency in teams.
- **Incentives:** Support R&D in human-AI collaboration technologies.

Core Insights: Investors should focus on companies enhancing human-AI collaboration for higher efficiency and productivity gains.

3. Addressing Ethical, Legal, and Societal Implications of AI

- **Core Value Protection**: Promote fairness and justice in AI.
- **Transparency and Privacy**: Ensure AI systems are transparent and protect privacy.
- **Standards Development**: Create standards for accountability and bias management.
- **Policy Documents**: The "AI Bill of Rights Blueprint" and "AI Risk Management Framework" provide guidelines.

Core Insights: Enhances public trust and compliance with ethical standards, reducing legal risks.

4. Ensuring the Safety and Security of AI Systems

- **System Testing and Verification**: Improve testing capabilities.
- **Cybersecurity Protection**: Safeguard AI from cybersecurity threats.
- **Secure Design**: Integrate security throughout the AI lifecycle.
- **Funding**: Support for safety standards research.

Core Insights: Ensures AI systems' reliability and security, mitigating risks.

5. Developing Shared Public Datasets and Environments for AI Training and Testing

- **Dataset Provision**: Provide accessible public datasets for AI research.
- **Computational Resources**: Offer high-performance computing resources.
- **Funding**: Support through the "National AI Research Resource Task Force".
- **Government Open Data Policies**: Promote open data sharing.

Core Insights: Facilitates AI innovation by providing necessary data and resources.

6. Measuring and Evaluating AI Systems through Standards and Benchmarks

- **Evaluation Techniques**: Develop standards for AI performance evaluation.
- **Management Frameworks**: Align methods with the "AI Bill of Rights Blueprint".
- **Incentives**: Encourage community engagement in standards development.

Core Insights: Ensures consistent and measurable AI performance.

7. Understanding National AI R&D Workforce Needs

- **Workforce Development**: Study and prepare for AI role demands.
- **Education Enhancement**: Improve AI education and training.
- **Funding**: Support educational programs.

Core Insights: Ensures a skilled workforce to meet future AI needs.

8. Expanding Public-Private Partnerships to Accelerate AI Progress

- **Sustained Investment**: Promote continuous AI R&D investment.
- **Broad Partnerships**: Establish collaborations across sectors.
- **Incentives**: Provide tax incentives and R&D grants.

Core Insights: Accelerates AI application and impact through collaboration.

9. Coordinated International AI Research Collaboration

- **Global Challenges**: Collaborate on global issues like sustainability.
- **Standards Development**: Promote global AI standards.
- **Support for Cooperative Projects**: Encourage international projects.

Core Insights: Facilitates global AI R&D, promoting technology sharing and cooperation.

Problems with Ai

Generative AI and Disinformation:

- AI-generated disinformation, including deepfakes, is a growing issue. The technology makes it easier to create realistic fake images, videos, and audio, which can be used to manipulate public opinion, particularly during elections（POLITICO）.

Security and Ethical Concerns:

- Generative AI models are prone to hacking, which can lead to the misuse of these technologies. There are ongoing concerns about the ethical implications of AI-generated content, particularly in terms of privacy and security（SecurityWeek）.

Data Privacy:

- As companies like Apple move towards personalized AI services, there are concerns about data privacy. Ensuring that AI systems protect user data while providing personalized experiences is a significant challenge（MIT Technology Review）.

Bias and Reliability in AI Models:

- Language models, such as GPT-4 and Google's Gemini, often produce biased outputs and can generate incorrect information. This unreliability poses significant challenges, especially as these models become more integrated into various applications（GPT-4 is here: what scientists think (nature.com)）.

Policy Validity

Addressing Misinformation: :

- The Executive Order includes provisions to develop standards and guidelines for identifying, labeling, and authenticating synthetic content, ensuring public confidence in the integrity of digital content, and using technical tools to prevent the creation of harmful AI-generated materials (refer to Section 4.5)

Data Privacy and Security:

- **Privacy-Enhancing Technologies (PETs):** Federal agencies are mandated to use PETs like secure multiparty computation, homomorphic encryption, and differential privacy to protect sensitive information and mitigate privacy risks. This ensures personal data is not improperly accessed, used, or disclosed (refer to Section 2(f)).
- **Lawful and Secure Data Practices:** Agencies must comply with legal standards and security measures to prevent the exploitation and exposure of personal data, including protecting against broader legal and societal risks such as the chilling of First Amendment rights due to improper data usage (refer to Section 2(f)).

Algorithmic Bias:

- **Technical Evaluations and Oversight:** The Executive Order requires robust technical evaluations of AI systems to detect and mitigate biases. This includes oversight and engagement with affected communities to ensure AI systems do not exacerbate existing inequities or introduce new forms of discrimination (refer to Section 2(d)).
- **Compliance with Federal Laws:** AI systems must comply with federal civil rights laws, guided by frameworks like the Blueprint for an AI Bill of Rights and the AI Risk Management Framework, to prevent unlawful discrimination in sectors such as hiring, housing, and healthcare(refer to Section 2(d)).

Security Issues:

- **Standardized Evaluations and Testing:** The order calls for the development of standardized guidelines and best practices for evaluating the safety and security of AI systems, including establishing red-teaming tests to identify and address potential vulnerabilities before deployment (refer to Section 4.1).

- **Critical Infrastructure and Cybersecurity:** Specific actions are mandated to protect critical infrastructure from AI-related risks, including annual risk assessments by relevant agencies, the development of best practices for managing AI-specific cybersecurity risks, and incorporating the AI Risk Management Framework into safety and security guidelines for critical infrastructure sectors (refer to Section 4.3) .

Policy Challenges：

1. Red Queen problem:

AI's rapid development often surpasses regulatory capabilities, leading to the "Red Queen problem," where regulators struggle to keep pace. Eric Schmidt, former Google Executive Chairman, argues that government regulation is ineffective, advocating for company-set boundaries. However, self-regulation has historically failed to prevent privacy violations, monopolies, manipulation, and disinformation (Brookings).

2. Transparency and Accountability:

Policies mandating transparency in AI development, such as the EU's AI Act, require companies to rigorously document and audit their AI systems to ensure they are trained on representative data sets to minimize biases. However, implementing these requirements can be challenging, especially for companies assessing and mitigating risks associated with their AI models. Failure to comply can lead to significant fines or exclusion from key markets like the EU(MIT Technology Review)

3. Who Regulates and How:

- **Lack of Dedicated Agency**: The U.S. has not established a specific agency for AI regulation. Proposals for a federal AI oversight agency exist, supported by industry leaders like OpenAI, Microsoft, and Meta, but progress has been slow.
- **Need for Flexibility**: A new regulatory body should adopt a flexible, risk-based approach. Licensing alone might reinforce the dominance of large companies, creating barriers for new entrants. Instead, a nuanced, agile regulatory method is necessary to balance protection and innovation.

  Europe has taken the lead in AI regulation with frameworks like the General Data Protection Regulation (GDPR) and the AI Act, setting global standards. The U.S. needs to act swiftly to avoid falling behind in regulatory influence(Brookings)

Diagonals analysis

Strengths

Comprehensive Framework:
The US policy on AI, as outlined in the Executive Order on the Safe, Secure, and Trustworthy Development and Use of Artificial Intelligence, provides a broad framework that addresses critical areas such as data privacy, algorithmic bias, security issues, and the ethical use of AI(The White House). The policy emphasizes the importance of privacy-enhancing technologies (PETs) and robust technical evaluations to ensure AI systems are safe and secure.

Focus on Innovation and Workforce Development:
The policy supports responsible AI innovation through AI-related education, training, and research investments. It aims to attract and retain AI talent, fostering a competitive ecosystem that benefits small developers and entrepreneurs . There are specific initiatives to support workforce transitions and skill development to mitigate the economic impact of AI-induced job displacement.

International Collaboration and Leadership: The US policy aims to lead global efforts in AI governance by engaging with international allies and partners to develop a common framework for managing AI's risks and unlocking its potential benefits.

Weaknesses

Implementation Challenges:
The rapid pace of AI development poses significant challenges to the effective implementation of regulatory measures. Existing regulatory frameworks may lack the agility needed to keep up with technological advancements, leading to potential gaps in oversight (Brookings). The complexity and opacity of AI systems make it difficult to ensure comprehensive and effective evaluations and testing.

Balancing Innovation and Regulation:
Striking a balance between promoting innovation and ensuring safety and security can be challenging. Over-regulation may stifle innovation, while under-regulation could lead to significant risks and ethical concerns (Brookings).

Economic Displacement:
While the policy addresses job displacement, the scale of potential disruption caused by AI may exceed the capacity of current support measures. Ensuring adequate support for workers transitioning to new roles will require significant resources and coordination (McKinsey & Company).

Opportunities

Enhancing Global Competitiveness:
By fostering a robust and innovative AI ecosystem, the US can enhance its global competitiveness in AI technologies. This includes attracting top talent and promoting research and development initiatives that drive technological advancements (MIT Technology Review).

Improving Public Trust and Adoption:
Effective governance and transparent practices can improve public trust in AI technologies. This includes ensuring AI systems are developed and used ethically, with adequate protections against bias, discrimination, and privacy violations(The White House).

Addressing Societal Challenges:
AI has the potential to address significant societal challenges, such as improving healthcare, enhancing public safety, and promoting economic growth. The policy's emphasis on responsible AI use can help unlock these benefits while mitigating associated risks (McKinsey & Company).

Threats

Technological and Ethical Risks:
The misuse of AI technologies, including the spread of misinformation and violation of privacy, poses significant ethical and security risks. Ensuring robust safeguards and compliance with ethical standards is crucial to mitigating these threats (Brookings) (McKinsey & Company).

Global Regulatory Landscape:
Differences in regulatory approaches across countries can create challenges for global AI governance. The US must navigate these complexities to ensure its policies are aligned with international standards while protecting its interests (MIT Technology Review).

Economic Inequality:
The economic impact of AI, including job displacement and wage polarization, could exacerbate existing inequalities. Ensuring equitable access to the benefits of AI and providing support for affected workers will be critical to addressing these concerns (McKinsey & Company).

AI Policy and Geopolitics

The rivalry between the U.S. and China in AI technology poses significant geopolitical risks. Both countries view AI as critical to their future economic and military power. China's comprehensive, top-down approach to AI governance and its integration of AI into its military strategy underscores its ambition to become a global AI leader. In contrast, the U.S. promotes a more open, innovation-driven approach but faces challenges in maintaining its leadership amid intense competition (Brookings) (Engage Media).

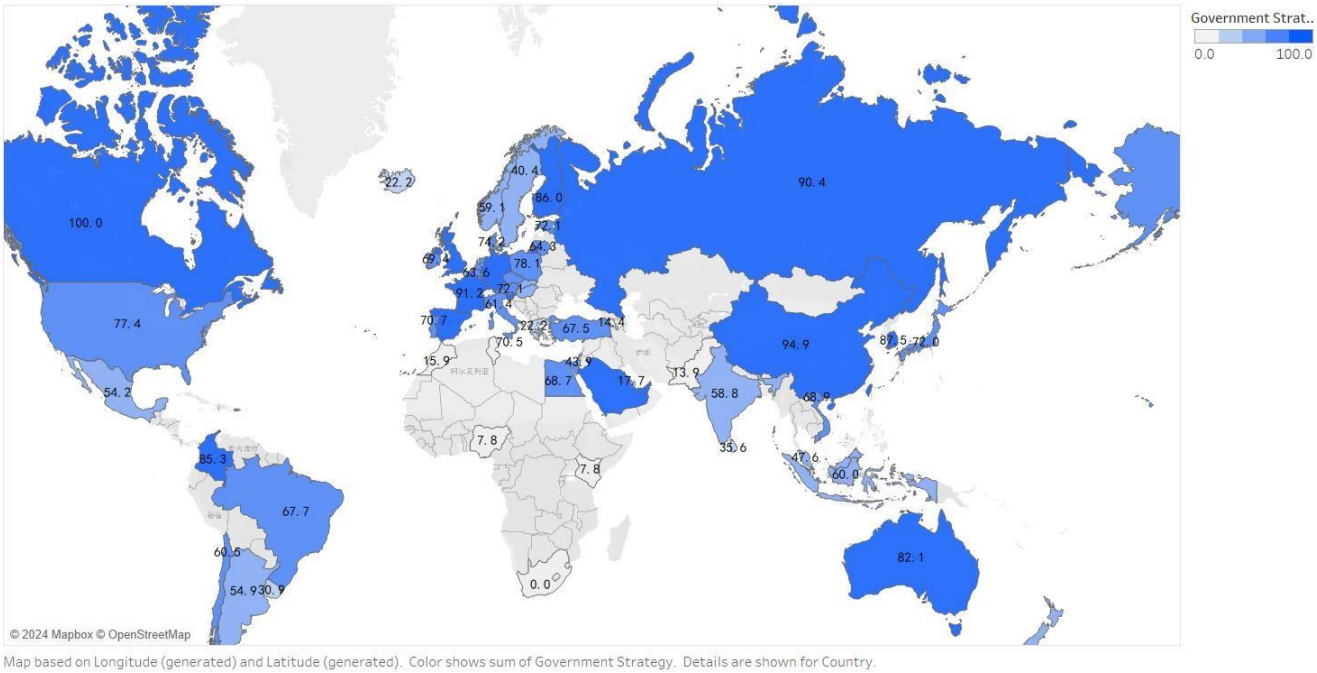

Table3: Global government AI commitment

Government Strategy is the factor of **Investment group of indicators, which reflects financial and procedural commitments to artificial intelligence.Data source: AI Global Index*

Technological Dominance:
China's significant investments in AI and military-civil fusion policy aim to create a competitive advantage. However, this could lead to increased strategic risks, including the potential for armed conflict or escalation of military tensions (CNAS).

Global AI Policy and Regulation:
The U.S. collaborates with other countries to establish global AI standards, such as the OECD's intergovernmental principles for trustworthy AI. This collaboration is crucial to mitigate the risks posed by AI and to ensure that technological advancements are aligned with democratic values and human rights (Brookings).

Economic Dependencies and Alliances:
The geopolitical landscape of AI also involves economic dependencies, such as Taiwan's reliance on AI chips. This adds another layer of complexity, as geopolitical tensions could disrupt supply chains and affect global AI development (Engage Media).

Recommendations for AI Regulation

1. Support Strategic Industry Players

- **Investment and Funding**: The U.S. government should increase funding and provide financial incentives to key AI companies like Tesla, Meta, and Amazon to drive innovation and maintain a competitive edge globally. Strategic support will foster technological advancements that can yield significant returns for investors (Publications Office of the EU) (ITI Council).

2. Develop a Comprehensive Regulatory Framework

- **Dedicated Regulatory Body**: Establish a federal AI regulatory agency or a self-regulatory organization (SRO) with the authority to audit, monitor, and regulate AI technologies. This agency should ensure that AI systems are safe, transparent, and ethically designed, reducing risks for investors by creating a stable regulatory environment (Publications Office of the EU) .
- **Pre-Market Testing**: Implement rigorous pre-market testing for AI algorithms, similar to clinical trials for drugs, to ensure safety and reliability before market deployment. This reduces the risk of investing in unproven technologies (Center for AI and Digital Policy).

3. Foster Collaboration and International Cooperation

- **Government and Private Sector Collaboration**: Encourage collaboration between government agencies, private companies, and international partners to create unified AI standards. This approach will harmonize regulatory practices, reduce compliance costs, and enhance market stability, benefiting investors through a predictable

regulatory landscape. This can also help mitigate geopolitical risks and ensure consistent oversight of AI technologies. (ITI Council) .

- **Global Standards Alignment**: Work with international partners to align AI regulatory standards globally. Consistent regulations will facilitate international business operations and reduce barriers to entry in foreign markets, providing growth opportunities for investors (AIIndex).

4. Economic Policies to Promote AI Development

- **Tax Incentives and Subsidies**: Introduce tax incentives and subsidies for AI research and development to lower AI companies' operational costs, increase innovation, and enhance profitability, making the sector more attractive to investors (Center for AI and Digital Policy).
- **Investment in AI Education**: Fund AI education and workforce development programs to ensure a steady pipeline of skilled professionals. A well-trained workforce will drive innovation and efficiency, positively impacting the long-term growth potential of AI companies (AIIndex).

5. Focus on Transparency and Accountability

- **Transparent AI Systems**: Mandate transparency in AI systems to ensure their decision-making processes are understandable and auditable. Transparent operations reduce regulatory risks and build trust with consumers and stakeholders, creating a favorable investment environment (Publications Office of the EU) (ITI Council).
- **Clear Disclosure Requirements**: Require companies to clearly define the purpose and intent of their AI tools and establish guardrails to prevent misuse. Clear regulations and disclosures protect against legal and reputational risks, making AI companies safer investment choices (Centre for Information Policy Leadership).

6. Addressing Social and Ethical Concerns

- **Regulations on Privacy and Bias**: Implement regulations to address privacy, fairness, and bias in AI applications. Ensuring ethical AI practices will enhance public trust and acceptance, leading to broader market adoption and increased returns for investors (Center for AI and Digital Policy) (AIIndex).
- **Fair and Equitable AI Deployment**: Promote AI applications that augment and aid workers rather than replace them. This will lead to sustainable economic growth and

create new market opportunities, benefiting long-term investment strategies (AIIndex)
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7. Economic and Military Investments:

- Continue investing in AI research and development, focusing on economic and military applications. This will help maintain competitive advantages and address strategic risks associated with AI.

- **Increase Multidisciplinary Research**: Investing in multidisciplinary research on trust in human-machine teams is crucial. Understanding how trust dynamics function under operational conditions can maximize the advantages of AI-enabled systems in speed, coordination, and endurance. This will help the U.S. military leverage AI for deterrence and operational effectiveness, ensuring interoperability with allies (Center for Security and Emerging Technology).

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