RCHUB: JOURNAL OF CONTEMPORARY TRENDS IN MANAGEMENT, COMMERCE AND ECONOMICS (JCMCE)
VOL: 2, ISSUE 4, OCT – DEC 2026
RCHUB PUBLISHER
ISSN: 3108-3501
DOI: https://doi.org/10.65725/JCMCE/2/4/013

# AI DEMOCRATIZATION OR AI CONCENTRATION? RETHINKING COMPETITIVENESS, TRADE INEQUALITY, AND GLOBAL MARKET INTEGRATION IN THE AGE OF ARTIFICIAL INTELLIGENCE.

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***Abstract:*** Artificial Intelligence (AI) is increasingly transforming the global economy by reshaping productivity, innovation, international competitiveness, trade, global value chains, employment, and the distribution of economic power. While cloud-based applications, open-source technologies, and commercially available AI tools are broadening access to AI-enabled capabilities, the foundational resources required to develop, control, and capture value from frontier AI—including advanced computing capacity, specialised talent, research capabilities, investment, intellectual property, data, and digital infrastructure—remain substantially concentrated. Against this background, the study examines the emerging AI democratization–concentration paradox and evaluates its implications for global competitiveness, international trade, global value chains, international economic inequality, and global market integration.

The study adopts a descriptive, analytical, and comparative research design based primarily on secondary data from internationally recognised sources, including the Stanford AI Index, UN Trade and Development, World Trade Organization, International Monetary Fund, World Bank, OECD, and other relevant international datasets and institutional reports. Evidence from the contemporary period, subject to data availability, is examined through descriptive statistics, trend analysis, cross-country comparison, and comparative interpretation, with particular attention to advanced, emerging, and developing economies. The analytical framework distinguishes three interrelated dimensions of AI participation: AI access, referring to the ability to use AI applications and services; AI capability, referring to the infrastructure, computing capacity, skills, data, research, investment, and innovation resources required to develop and effectively utilise AI; and AI control, referring to ownership or influence over foundational technologies, intellectual property, platforms, computing infrastructure, and other critical sources of AI-related economic value.

The findings indicate that AI is becoming an increasingly important determinant of global competitiveness, with technological infrastructure, skilled human capital, research capacity, investment, and innovation ecosystems increasingly complementing conventional sources of competitive advantage. The study further finds that although AI access is expanding, genuine democratization remains uneven because the complementary capabilities required for productive and sustainable AI participation are unequally distributed. At the same time, frontier AI development, advanced computing, investment, specialised talent, intellectual property, and major technological platforms remain substantially concentrated, creating new forms of technological dependency and potential market power.

AI is also found to have significant implications for international trade and global value chains by reducing transaction and coordination costs, improving productivity, facilitating digitally delivered services, and creating opportunities for technological upgrading, while simultaneously altering traditional sources of comparative advantage. The distribution of these benefits remains uneven, raising concerns regarding international economic inequality and

ISSN: 3108-3501
DOI: https://doi.org/10.65725/JCMCE/2/4/013

technological divergence. The study further identifies a dual effect on global market integration: AI can deepen economic interdependence through trade, investment, digital services, and global value chains, while the concentration of critical AI capabilities can generate technological dependency and fragmentation.

Overall, the study concludes that AI is neither purely democratizing nor purely concentrating; rather, it is producing a "diffusion of use with concentration of capability." The future inclusiveness of the global AI economy will therefore depend not merely on expanding access to AI applications, but on strengthening infrastructure, computing capacity, skills, research, innovation, domestic technological capabilities, value creation, and greater control over the resources underlying AI.

## I. INTRODUCTION

Artificial Intelligence (AI) has emerged as one of the most transformative forces shaping the contemporary global economy, extending its influence beyond technological innovation into production, trade, investment, employment, and international competitiveness. Unlike earlier waves of technological change that were often concentrated within sectors, AI increasingly functions as a general-purpose technology with the potential to transform a broad range of economic activities simultaneously. Its rapid diffusion is changing how firms produce, innovate, compete, and participate in global markets, while governments are increasingly treating AI capabilities as strategic assets for economic growth and technological leadership. As AI becomes embedded in production systems, digital platforms, financial services, logistics, research, and global value chains, access to computational capacity, data, digital infrastructure, skilled talent, intellectual property, and investment is becoming increasingly important in determining economic and competitive advantage.

The transformative potential of AI, however, presents a fundamental paradox between democratization and concentration. On one hand, AI can contribute to democratization by lowering barriers to knowledge, innovation, entrepreneurship, and productivity. Cloud computing, open-source models, digital platforms, and increasingly accessible AI applications can enable smaller firms and economies with limited traditional resources to acquire capabilities that were previously available primarily to technologically advanced actors. On the other hand, the development and deployment of frontier AI require substantial computing power, high-quality data, financial capital, specialized talent, research capabilities, and advanced infrastructure. These requirements may reinforce the position of countries and firms that already possess significant technological and financial resources. In this study, AI democratization refers to the broadening and diffusion of access to the capabilities required to develop, adopt, and benefit from AI, whereas AI concentration refers to the increasing concentration of technological capabilities, infrastructure, ownership, market power, and economic value associated with AI. The coexistence of these forces creates a central tension: AI may simultaneously expand access to technological opportunities while concentrating the underlying sources of economic power.

This tension has important implications for the changing foundations of global competitiveness. In an AI-driven economy, competitive advantage is increasingly shaped not only by conventional factors such as natural resources, labour costs, physical capital, and market size, but also by access to advanced computing infrastructure, data, AI talent, research ecosystems, intellectual property, investment, and innovation networks. Countries and firms capable of mobilizing these resources may achieve substantial productivity, innovation, and export

ISSN: 3108-3501
DOI: https://doi.org/10.65725/JCMCE/2/4/013

advantages, while those lacking them may encounter increasing barriers to technological upgrading and international competition. AI therefore has the potential to alter established patterns of comparative and competitive advantage and reshape the hierarchy of economic power between technologically advanced, emerging, and developing economies.

These changes extend directly into international trade and global value chains. AI can improve productivity, reduce transaction and coordination costs, enhance logistics and forecasting, automate selected production processes, and facilitate trade in digitally delivered services. At the same time, AI-enabled automation may change the relative importance of labour, capital, technology, and proximity to markets in determining the location of economic activity. Firms may consequently reconsider production, sourcing, outsourcing, and investment decisions as AI changes the organization of cross-border production. Such developments could create opportunities for emerging and developing economies to upgrade their participation in global value chains and enter new digitally enabled markets. However, if advanced AI capabilities remain concentrated among a limited number of countries and firms, the same technological transformation could reinforce existing asymmetries in technological capabilities and constrain the ability of less-developed economies to capture higher-value activities.

The distribution of these opportunities and gains raises a broader concern regarding international economic inequality. AI-driven productivity growth may generate substantial benefits through higher output, investment, innovation, employment opportunities, and export competitiveness, but these benefits are unlikely to be distributed evenly across countries, firms, sectors, or workers. Economies with stronger technological ecosystems may capture a greater proportion of AI-generated value, while those constrained by inadequate infrastructure, limited skills, insufficient investment, or institutional weaknesses may experience slower adoption and reduced competitiveness. At the firm level, the concentration of foundational AI technologies, computing infrastructure, platforms, data, intellectual property, and investment among dominant technology companies may strengthen market power and enable the capture of significant economic rents. Thus, the central issue is not simply whether AI generates economic growth, but who possesses the capabilities to generate, control, and capture the value created by AI.

These dynamics also necessitate a renewed examination of global market integration. Technological progress has historically contributed to deeper economic interdependence by reducing transaction costs, expanding production networks, and facilitating cross-border flows of goods, services, capital, and knowledge. AI could strengthen these processes by improving connectivity, enabling digital trade, and facilitating participation in increasingly sophisticated global value chains. Yet the concentration of critical AI capabilities may produce an opposing dynamic. Dependence on a small number of countries, firms, platforms, computing providers, and technology ecosystems could generate new forms of technological dependency, strategic vulnerability, digital inequality, and market fragmentation. Differences in access to AI infrastructure, data, talent, intellectual property, and investment may increasingly determine which economies participate actively in the emerging AI-driven global economy and which remain dependent on externally controlled technological capabilities.

Despite the growing literature on AI, productivity, automation, digital trade, and technological inequality, these dimensions are frequently examined in isolation rather than as interconnected elements of a broader transformation in global economic power. Greater attention is needed to the relationship between the democratization of AI capabilities and their simultaneous concentration among leading countries and firms, and to how this tension translates into changes

ISSN: 3108-3501
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in competitiveness, international trade, inequality, and global market integration. Addressing this gap requires an integrated perspective that moves beyond viewing AI solely as a source of productivity or innovation and instead considers its implications for the distribution of technological capabilities and economic power across the global economy.

Against this background, this paper critically examines whether the global diffusion of AI is contributing primarily to the democratization of technological and economic capabilities or the concentration of economic power. It assesses how AI is transforming the determinants of global competitiveness; examines the extent and determinants of AI democratization; analyses the concentration of AI-related economic power; evaluates the effects of AI on international trade and global value chains; and investigates its implications for international economic inequality. Finally, it examines whether these competing dynamics are strengthening economic interdependence or contributing to technological fragmentation and dependency. By bringing competitiveness, trade, inequality, and global market integration into a unified analytical framework, the study seeks to rethink the consequences of AI for the international economic order. At its core, the paper asks a broader question: will the age of Artificial Intelligence democratize the capabilities necessary for meaningful participation in the global economy, or will it establish a new hierarchy in which technological control and economic value become increasingly concentrated among a limited number of countries and firms?

## II. OBJECTIVES

- To assess the transformation of global competitiveness under AI-driven technological change by examining how AI capabilities are altering the sources and determinants of competitive advantage among countries and firms.
- To examine the extent and determinants of AI democratization by analysing differences in access to AI technologies, computational resources, data, skills, infrastructure, and innovation capabilities across countries, firms, and industries.
- To analyse the concentration of AI-related economic power by investigating the ownership and control of foundational technologies, computing infrastructure, platforms, data, intellectual property, and investment, and their role in shaping market power and value capture.
- To evaluate the impact of AI on international trade and global value chains by examining changes in trade patterns, export competitiveness, production location, outsourcing, digital trade, and participation in cross-border production networks.
- To determine the implications of AI-driven transformation for international economic inequality by analysing differences in productivity gains, investment opportunities, employment effects, technological capabilities, export performance, and the distribution of AI-generated economic benefits between advanced, emerging, and developing economies.
- To assess the implications of AI democratization and concentration for the nature and trajectory of global market integration by examining whether AI is strengthening economic interdependence or contributing to technological fragmentation, dependency, and the restructuring of global economic relationships.

## III. REVIEW OF LITERATURE

### 3.1 AI and Global Competitiveness

Recent literature increasingly identifies Artificial Intelligence as an emerging determinant of global competitiveness through its effects on productivity, innovation, investment, and

ISSN: 3108-3501
DOI: https://doi.org/10.65725/JCMCE/2/4/013

technological capability. The Stanford AI Index (2026) reports that global corporate AI investment more than doubled during 2025, while the United States continued to dominate private AI investment and entrepreneurial activity. The report also indicates that frontier AI development remains highly concentrated, suggesting that the capacity to develop advanced AI is becoming an important source of competitive advantage. Similarly, UN Trade and Development (2025) emphasizes that AI can enhance productivity and transform production and supply chains, but argues that countries require adequate infrastructure, data, skills, and institutional capabilities to translate technological advances into economic benefits. These findings suggest that AI is not simply another productivity-enhancing technology; it is increasingly influencing the underlying capabilities through which countries and firms compete.

### 3.2 AI Democratization and Technological Access

A growing body of recent literature focuses on whether AI capabilities are becoming broadly accessible across countries, firms, and industries. UN Trade and Development (2025) identifies infrastructure, data, and skills as critical requirements for inclusive AI development and warns that unequal access could deepen existing global technological divides. The World Trade Organization (2025) similarly reports substantial differences in AI adoption across economies, with adoption considerably higher among firms in high-income economies than among those in low-income economies. Smaller firms also face additional barriers associated with limited expertise, financial resources, and adoption costs. These findings suggest that the increasing availability of AI applications does not automatically constitute democratization. Genuine AI democratization requires broader access to the technological, financial, infrastructural, and human capabilities necessary to develop and use AI productively.

### 3.3 AI Concentration and Market Power

Alongside increasing accessibility, recent evidence points towards a simultaneous concentration of AI-related economic power. The Stanford AI Index (2026) reports that industry produced more than 90% of notable frontier AI models in 2025, while investment in AI and the computing infrastructure required for advanced systems remains heavily concentrated in a small number of economies and firms. UN Trade and Development (2025) similarly highlights the concentration of AI research, patents, investment, and advanced computing capabilities in leading economies. This evidence reveals an important paradox: AI applications may become increasingly accessible while the underlying resources, infrastructure, intellectual property, investment, and technological capabilities required to develop frontier AI remain concentrated. The literature therefore highlights the distinction between access to AI applications and control over the underlying sources of AI capability and economic value.

### 3.4 AI, International Trade and Global Value Chains

Recent research demonstrates that AI has considerable potential to transform international trade and global value chains by reducing transaction costs, improving productivity, enhancing logistics, facilitating forecasting, and expanding digitally delivered services. The World Trade Organization (2025) argues that AI can substantially increase global trade by improving productivity and reducing trade-related costs, while the distribution of these benefits will depend on the ability of economies to adopt and effectively use AI. The report further suggests that differences in technological capabilities and policy environments may influence the extent to which countries benefit from AI-enabled trade. AI may therefore create opportunities for emerging and developing economies to participate in new digitally enabled markets and upgrade their position within global value chains. At the same time, automation and changing production requirements could alter traditional sources of comparative advantage and influence decisions concerning production location, outsourcing, and international investment.

ISSN: 3108-3501
DOI: https://doi.org/10.65725/JCMCE/2/4/013

### 3.5 AI and International Economic Inequality

The distribution of AI-related benefits has emerged as a major concern within recent research. UN Trade and Development (2025) argues that technological progress does not automatically result in inclusive development and emphasizes substantial differences in AI infrastructure, skills, computing capacity, and innovation capabilities across economies. The World Trade Organization (2025) similarly indicates that unequal access to AI-related capabilities may lead to significant differences in the distribution of productivity and trade gains. The International Monetary Fund (2026) further emphasizes the potential of AI to influence productivity, employment, investment, and income distribution, with outcomes varying according to countries' technological preparedness and economic structures. These findings suggest that AI may simultaneously generate new productivity opportunities and reinforce existing economic disparities. Consequently, the distribution of productivity gains, investment, employment opportunities, export advantages, and AI-generated economic value is central to determining whether AI narrows or widens international economic inequality.

### 3.6 AI and Global Market Integration

The literature increasingly recognizes that AI may have contradictory implications for global market integration. On the one hand, AI can reduce transaction and coordination costs, facilitate digital trade, improve cross-border communication, and strengthen participation in global production networks. On the other hand, differences in technological capabilities, digital infrastructure, regulatory systems, data governance, and access to computing resources may generate new forms of technological fragmentation and dependency. The World Trade Organization (2025) emphasizes that AI has the potential to support more inclusive global economic growth, but unequal access to AI capabilities may prevent economies from benefiting equally. UN Trade and Development (2025) similarly stresses the importance of international cooperation and inclusive technological development to prevent AI from reinforcing existing global divides. The literature therefore presents global integration as an uncertain outcome of AI-driven transformation: AI could deepen economic interdependence, but concentration of critical technological capabilities could simultaneously produce new forms of fragmentation and dependency.

### 3.7 Synthesis of the Literature and Research Gap

Collectively, the literature establishes that AI is increasingly influencing global competitiveness, technological capabilities, international trade, global value chains, employment, and economic development. However, these dimensions are frequently examined separately. Comparatively less attention has been given to the simultaneous processes of AI democratization and AI concentration as interconnected forces shaping the distribution of global economic power. There remains insufficient integration of how unequal access to computing capacity, data, infrastructure, skills, investment, intellectual property, and innovation ecosystems interacts with the concentration of frontier AI capabilities and how this relationship subsequently affects competitiveness, trade, inequality, and global market integration.

This study addresses this gap by bringing AI democratization, AI concentration, global competitiveness, international trade, economic inequality, and global market integration together within a single analytical framework. Rather than treating AI solely as a source of productivity and technological innovation, the study examines it as an emerging determinant of global economic power and the distribution of competitive capabilities. It therefore seeks to determine not only whether AI creates new economic opportunities, but also who can access those

ISSN: 3108-3501
DOI: https://doi.org/10.65725/JCMCE/2/4/013

opportunities, who controls the critical capabilities underlying AI, who captures the resulting economic value, and whether these dynamics ultimately contribute to a more inclusive and integrated global economy or reinforce a new hierarchy of technological and economic power.

## IV. RESEARCH GAP

The existing literature provides growing evidence that Artificial Intelligence is transforming productivity, innovation, international trade, employment, investment, and economic development. However, an important gap remains in understanding how these transformations affect the distribution of technological and economic power across the global economy. Existing studies tend to examine AI adoption, productivity, trade, technological inequality, or market concentration as separate issues. Consequently, there is limited integrated analysis of the relationship between the democratization of AI capabilities and the concentration of AI-related economic power.

A first gap concerns the distinction between access to AI and control over AI capabilities. The increasing availability of AI applications, cloud services, open-source models, and digital platforms may broaden access to AI-enabled technologies. However, the underlying capabilities required to develop and control advanced AI—including computing infrastructure, high-quality data, specialized talent, research capacity, intellectual property, investment, and technological infrastructure—remain unevenly distributed. Existing literature does not sufficiently examine whether the wider diffusion of AI applications represents genuine democratization of technological capabilities or whether economies are becoming users of technologies whose critical resources remain concentrated among a relatively small number of countries and firms.

A second gap relates to the concentration of AI-related economic power. Although recent research identifies substantial concentration in frontier AI development, investment, computing infrastructure, research, patents, and leading technology firms, these dimensions are often analysed independently. There is insufficient integrated examination of how concentration across these resources contributes to market power, technological dependence, and the ability of countries and firms to capture AI-generated economic value. This is important because widespread AI adoption does not necessarily imply widespread ownership or control of the technologies and infrastructure underlying AI.

A third gap concerns the relationship between AI capabilities and global competitiveness. Traditional explanations of competitiveness emphasize factors such as labour, capital, natural resources, market size, infrastructure, and institutional quality. AI introduces additional determinants, including computing capacity, AI skills, data, research ecosystems, digital infrastructure, innovation capability, and access to investment. However, relatively limited attention has been given to how these emerging AI-related capabilities interact with existing determinants of competitiveness and whether they are contributing to a restructuring of the competitive position of advanced, emerging, and developing economies.

A fourth gap concerns the effect of AI on international trade and global value chains. Existing research recognizes that AI can reduce transaction costs, increase productivity, improve logistics, facilitate digital trade, and enable new forms of cross-border production. However, less attention has been given to how differences in AI capabilities affect the ability of countries to capture these benefits. In particular, there remains insufficient understanding of whether AI enables emerging and developing economies to upgrade into higher-value activities and digitally

ISSN: 3108-3501
DOI: https://doi.org/10.65725/JCMCE/2/4/013

delivered services, or whether AI-driven automation and technological concentration reinforce existing patterns of specialization and dependency.

A fifth gap concerns the international distribution of AI-generated economic benefits. Existing research increasingly recognizes that AI may generate substantial productivity and innovation gains while producing unequal effects across workers, firms, sectors, and countries. Nevertheless, comparatively less attention has been devoted to examining how differences in AI capabilities influence the distribution of productivity gains, investment, employment opportunities, export competitiveness, technological upgrading, and economic value between advanced, emerging, and developing economies. This limits our understanding of whether AI will contribute to convergence in global economic development or create new forms of technological divergence.

Finally, there is a gap in understanding the implications of AI for global market integration. AI may strengthen international economic integration by lowering transaction and coordination costs, facilitating digital trade, and improving participation in global value chains. At the same time, concentration of critical AI technologies, infrastructure, platforms, and intellectual property may create new forms of technological dependence, strategic vulnerability, and fragmentation. Existing literature has not sufficiently reconciled these two opposing possibilities.

Therefore, the central research gap addressed by this study is the lack of an integrated framework linking AI democratization and AI concentration with global competitiveness, international trade, economic inequality, and global market integration. Rather than examining AI only as a productivity-enhancing or disruptive technology, this study approaches AI as an emerging determinant of the distribution of global economic power. It specifically examines who can access AI capabilities, who controls the critical resources underlying AI, who captures the resulting economic value, and how these processes influence the structure of the global economy.

By bringing these dimensions together, the study contributes to the literature by distinguishing between the diffusion of AI use and the distribution of AI capability and control. This distinction provides a basis for assessing whether the global expansion of AI is genuinely democratizing economic opportunities or whether it is simultaneously creating a new hierarchy in which technological capability, infrastructure, investment, and value capture remain concentrated among a limited number of countries and firms.

## V. RESEARCH METHODOLOGY

### 5.1 Research Approach and Design

- This study adopts a descriptive, analytical, and comparative research approach based primarily on secondary data. The approach is appropriate because the study seeks to examine the relationship between the global diffusion of Artificial Intelligence and the distribution of technological and economic capabilities across countries. The research does not examine AI solely as a technological innovation; rather, it investigates how differences in access to, control over, and capacity to utilize AI influence global competitiveness, international trade, economic inequality, and global market integration.
- The study follows a comparative design in order to examine differences between advanced, emerging, and developing economies. The descriptive component identifies differences in AI readiness, digital infrastructure, investment, skills, adoption, research capacity, and technological concentration. The analytical component examines how these differences

ISSN: 3108-3501
DOI: https://doi.org/10.65725/JCMCE/2/4/013

correspond with variations in competitiveness, trade performance, global value-chain participation, productivity, and economic development. The comparative component allows the study to determine whether AI is contributing to greater convergence of technological capabilities or reinforcing existing differences between economies.

- The central analytical premise is that AI may generate two processes simultaneously. AI democratization represents the broader diffusion of access to AI technologies and the capabilities required to benefit from them, whereas AI concentration represents the concentration of critical resources, infrastructure, knowledge, investment, intellectual property, and market power associated with AI. The study therefore does not assume that AI is inherently democratizing or concentrating. Instead, it examines whether wider access to AI applications is accompanied by broader technological capabilities or whether the underlying sources of AI-related economic power remain concentrated.

**5.2 Sources of Data**

- The study relies primarily on secondary data obtained from internationally recognized and authoritative sources. Key sources include the Stanford AI Index, UN Trade and Development (UNCTAD), World Trade Organization (WTO), International Monetary Fund (IMF), World Bank, International Telecommunication Union (ITU), World Intellectual Property Organization (WIPO), OECD, and International Labour Organization (ILO), subject to the availability and comparability of relevant indicators.
- These sources provide evidence on AI investment, research and development, computing and digital infrastructure, AI-related skills, technology adoption, patents, innovation, productivity, employment, trade, foreign investment, and economic development. International institutional reports and relevant academic studies are also used to provide contextual and qualitative evidence on technological concentration, policy developments, global value chains, and the changing structure of AI-related economic power.
- The use of multiple authoritative sources enables data triangulation, whereby evidence from different sources is compared to improve consistency and reduce dependence on any single indicator or dataset. The study focuses primarily on recent evidence and comparable data from the period "2020–2026, subject to data availability", to capture the rapid expansion of generative and frontier AI during the contemporary period.

**5.3 Variables and Dimensions of the Study**

The study examines six interconnected dimensions.

- **AI Democratization** refers to the extent to which countries, firms, and industries have access to and can effectively utilize the capabilities required to benefit from AI. It is assessed through indicators relating to digital and computing infrastructure, internet connectivity, AI-related skills and human capital, AI adoption, research and innovation capacity, investment, and access to digital technologies.
- **AI Concentration** refers to the concentration of the critical technological and economic resources underlying advanced AI. It is examined through indicators relating to frontier AI development, AI investment, computing infrastructure, research talent, patents and intellectual property, leading firms and platforms, and other critical technological capabilities.
- **Global Competitiveness** is examined through indicators including productivity, innovation, research and development, high-technology exports, digital services, foreign investment, and technological capability. These indicators help assess whether stronger AI capabilities are associated with greater economic and technological competitiveness.

ISSN: 3108-3501
DOI: https://doi.org/10.65725/JCMCE/2/4/013

- **International Trade and Global Value Chains** are assessed through merchandise and services exports, digitally delivered services, high-technology exports, foreign direct investment, export diversification, and participation in global value chains. These indicators help determine whether AI is enabling economies to enter or upgrade within higher-value international production and service networks.
- **International Economic Inequality** is examined through differences across economies in productivity, income, technological capabilities, investment, skills, innovation, export performance, and the ability to capture AI-related economic benefits. This allows the study to assess whether AI contributes to convergence or reinforces technological and economic divergence.
- **Global Market Integration** is assessed through trade openness, international services trade, foreign investment, digital trade, global value-chain participation, technological linkages, and indicators of technological dependence. This dimension captures both the integrative and fragmentary possibilities associated with AI.

### 5.4 Analytical Framework

The study employs an integrated analytical framework linking AI capabilities to broader economic outcomes:

**AI Capabilities → AI Democratization / AI Concentration → AI Adoption and Control Competitiveness and Trade → Distribution of Economic Benefits → Global Market Integration**

- The framework distinguishes between **AI access, AI capability, and AI control**. Access refers to the ability to use AI applications and services; capability refers to the infrastructure, skills, research, investment, data, and technological resources required to develop and effectively utilize AI; and control refers to ownership or influence over critical technologies, computing infrastructure, intellectual property, platforms, and other sources of AI-related economic value.
- This distinction is central to the study because a country may have relatively high AI adoption while remaining dependent on foreign providers for advanced models, computing infrastructure, semiconductors, platforms, intellectual property, or investment. Consequently, the diffusion of AI applications does not necessarily imply the democratization of the underlying sources of technological and economic power.

The study therefore examines the following conceptual relationship:

**AI Access + Low Concentration → Broader AI Democratization**
**AI Access + High Concentration → Widespread AI Use with Concentrated Underlying Capabilities**
**Low AI Access + High Concentration → Technological Dependence**
**Low AI Access + Low Concentration → Limited AI Development and Adoption**

- The second condition is particularly important because it captures the central paradox of the research: AI may become increasingly accessible at the application level while the underlying sources of AI-related economic power remain concentrated.

### 5.5 Data Analysis and Comparative Analysis

- The study primarily employs descriptive statistics, trend analysis, cross-country comparison, and comparative interpretation to identify patterns in AI capabilities and their economic implications. Countries are examined according to their level of technological

ISSN: 3108-3501
DOI: https://doi.org/10.65725/JCMCE/2/4/013

and economic development, with particular attention to differences between advanced, emerging, and developing economies.

- The analysis first compares economies in terms of AI readiness, infrastructure, skills, investment, research capacity, adoption, and technological concentration. It then examines whether these differences correspond with variations in competitiveness, productivity, innovation, trade performance, digital services, high-technology exports, and global value-chain participation.
- For international trade, particular attention is given to whether stronger AI capabilities are associated with greater participation in digitally delivered services, technologically sophisticated exports, and higher-value global value chains. The analysis also considers whether AI-enabled automation may alter traditional comparative advantages based on low-cost labour and influence production location, outsourcing, and international investment.
- For international inequality, the study compares differences in technological capabilities, productivity, investment, skills, exports, and economic value capture across different groups of economies. The objective is to determine whether AI is contributing to technological and economic convergence or creating new forms of divergence.
- For global market integration, the study evaluates two opposing mechanisms. AI may strengthen integration by reducing transaction and coordination costs, facilitating digital trade, improving logistics, and supporting participation in global production networks. Conversely, concentration of critical AI technologies, infrastructure, investment, intellectual property, and expertise may create technological dependence, strategic vulnerability, and fragmentation. Global integration is therefore assessed not only through trade and investment but also through patterns of technological interdependence and dependency.
- Where sufficiently comparable data are available, statistical relationships between AI-related indicators and economic outcomes will be examined to identify broader associations. However, the study will avoid interpreting correlation as definitive causation because economic performance and AI capability may influence each other.

**5.6 Reliability and Validity**

- The reliability of the study is strengthened using internationally recognized data sources, consistent indicators, and multiple forms of evidence. Wherever possible, data from different institutions are compared to identify inconsistencies and improve measurement accuracy.
- The validity of the analysis is strengthened by treating AI democratization and AI concentration as multidimensional concepts rather than relying on a single indicator. The study also distinguishes between AI adoption and AI capability, thereby avoiding the assumption that widespread use of AI automatically indicates technological independence or control.
- The interpretation of findings is based on the convergence of evidence from international datasets, institutional reports, and relevant academic literature. This triangulated approach provides a more comprehensive assessment of the relationship between AI capabilities and global economic outcomes.

**5.7 Scope and Limitations**

- The study is based primarily on secondary data and is therefore dependent on the availability, quality, and international comparability of existing datasets. Since AI is evolving rapidly, some indicators may not fully capture the latest developments in frontier

ISSN: 3108-3501
DOI: https://doi.org/10.65725/JCMCE/2/4/013

models, computing capacity, investment, or adoption. Furthermore, certain dimensions of AI concentration—including proprietary computing capacity, data ownership, platform dependence, and the distribution of AI-generated economic rents—are difficult to measure precisely using publicly available data.

- The study therefore focuses on identifying broad and robust patterns rather than claiming to measure every dimension of AI-related economic power with complete precision. Differences in definitions and measurement across international datasets are also recognized and addressed through comparison and triangulation. Finally, because the research is primarily comparative and based on secondary evidence, its findings should be interpreted as identifying important relationships and structural patterns rather than establishing definitive causal effects.
- Overall, the methodology provides a coherent framework for examining the central research question: whether the global diffusion of Artificial Intelligence is democratizing the capabilities necessary for meaningful participation in the global economy or whether technological control and AI-generated economic value are becoming increasingly concentrated among a limited number of countries and firms.

## VI. FINDINGS

### 6.1 AI and the Transformation of Global Competitiveness

- The analysis finds that Artificial Intelligence is becoming an increasingly important determinant of global competitiveness alongside conventional factors such as labour, capital, infrastructure, natural resources, and market size. Competitive advantage is increasingly influenced by access to advanced computing capacity, digital infrastructure, AI-related skills, research capabilities, investment, data, and innovation ecosystems.
- The evidence indicates that economies with stronger technological and institutional capabilities are better positioned to develop, adopt, and scale AI technologies. Established research systems, skilled human capital, investment capacity, and digital infrastructure can reinforce technological advantages by facilitating further innovation and AI adoption.
- AI is therefore not simply improving productivity within existing economic structures; it is also changing the foundations of international competitiveness. Economies capable of integrating AI with skilled human capital, research institutions, infrastructure, investment, and innovation networks are better positioned to compete in technology-intensive and knowledge-based activities.
- The findings further indicate that a distinction must be made between using AI and possessing the capabilities required to develop and control AI. Consequently, widespread access to AI applications alone does not necessarily translate into long-term technological competitiveness.

### 6.2 The Uneven Democratization of AI Capabilities

- The study finds that AI applications and services are becoming increasingly accessible through cloud computing, digital platforms, open-source technologies, and commercially available AI tools. This expansion has lowered some barriers to technological adoption and has enabled smaller firms and economies to access capabilities that previously required substantial technological resources.
- However, wider access to AI applications does not automatically constitute genuine AI democratization. Meaningful participation in the AI economy also requires reliable digital

ISSN: 3108-3501
DOI: https://doi.org/10.65725/JCMCE/2/4/013

infrastructure, computing resources, skilled human capital, data, investment, research capabilities, and institutional capacity.

- The evidence indicates substantial differences in AI adoption and readiness across income groups. High-income economies generally demonstrate greater capacity to adopt AI, while smaller firms and firms in lower-income economies face greater constraints related to expertise, financial resources, infrastructure, and adoption costs.
- The study therefore finds that AI democratization is expanding but remains uneven. Access is becoming broader at the application level, while the complementary capabilities required to use AI productively and independently remain unequally distributed.
- This distinction is central to the research: AI diffusion should not be equated with AI democratization. Genuine democratization requires not only access to AI tools but also the capacity to generate, adapt, integrate, and derive sustainable economic value from them.

### 6.3 Concentration of AI-Related Economic Power

- While access to AI is expanding, the study finds substantial concentration of the foundational resources underlying advanced AI. These include computing infrastructure, frontier model development, research talent, investment, intellectual property, platforms, and technological expertise.
- Recent evidence indicates that industry produced more than 90% of notable AI models in 2025, demonstrating the increasingly dominant role of private-sector resources and capabilities in frontier AI development. Similarly, international evidence identifies substantial concentration in AI research, patents, investment, and computing capabilities.
- The findings indicate that concentration occurs across multiple layers of the AI ecosystem rather than through a single resource. Computing capacity, financial investment, advanced research, skilled talent, intellectual property, and major technology platforms can reinforce one another and contribute to the persistence of technological advantages.
- This creates an important distinction between access to AI and control over AI. A country or firm may have extensive access to AI applications while remaining dependent on external providers for advanced models, cloud infrastructure, computing resources, semiconductors, platforms, or intellectual property.
- The analysis therefore identifies the coexistence of AI democratization at the application level and AI concentration at the foundational level as one of the defining characteristics of the contemporary AI economy.

### 6.4 AI, International Trade and Global Value Chains

- The findings indicate that AI is reshaping the potential structure of international trade and global value chains by improving productivity, reducing transaction and coordination costs, enhancing logistics and forecasting, and facilitating digitally delivered services.
- Economies with stronger AI capabilities are better positioned to participate in knowledge-intensive services, digital exports, high-technology activities, and higher-value segments of global value chains. AI can therefore create opportunities for emerging economies to upgrade their participation in international production and service networks.
- However, AI is also changing traditional determinants of comparative advantage. As automation and AI-enabled production become more important, the relative importance of low-cost labour may decline for some activities, while the importance of technology, skills, infrastructure, and innovation capacity increases.
- This creates both opportunities and risks for emerging and developing economies. AI can help firms overcome certain traditional barriers to international market participation, but

ISSN: 3108-3501
DOI: https://doi.org/10.65725/JCMCE/2/4/013

inadequate infrastructure, limited skills, insufficient investment, and technological dependence may restrict their ability to capture higher-value activities.

- The findings therefore suggest that participation in AI-enabled trade does not necessarily imply equal participation in AI-generated value. Countries may expand their digital exports while remaining dependent on foreign providers of cloud computing, advanced models, semiconductors, platforms, or intellectual property.
- Consequently, the impact of AI on global value chains depends not only on whether countries adopt AI, but also on whether they develop domestic capabilities that enable movement towards higher-value activities and greater value capture.

### 6.5 AI and International Economic Inequality

- The analysis indicates that differences in AI readiness can reinforce existing differences in productivity, innovation, investment, technological capability, and economic development.
- Economies with stronger infrastructure, research ecosystems, investment capacity, skilled labour, and institutional capabilities possess greater opportunities to convert AI advances into productivity and economic gains. In contrast, economies facing infrastructure, skills, financing, and institutional constraints may experience slower adoption and reduced capacity to capture AI-related benefits.
- However, the findings also demonstrate that the relationship between AI and inequality is not predetermined. Emerging economies with substantial human capital, digital capabilities, research capacity, and innovation ecosystems can develop meaningful positions within the global AI economy. The global AI landscape should therefore not be understood simply as a division between advanced economies that develop AI and developing economies that merely consume it.
- The distribution of AI-generated benefits is consequently influenced by a country's ability to develop complementary capabilities. Infrastructure, skills, investment, research, innovation systems, and institutional capacity determine whether AI access can be converted into sustainable productivity, employment, export, and value-creation opportunities.
- The study therefore finds that AI has the potential to contribute to either economic convergence or technological divergence. Without broader capability development, the concentration of foundational AI resources may reinforce existing inequalities; with effective capability development, AI can create opportunities for technological upgrading and broader economic participation.

### 6.6 AI, Global Market Integration and Technological Dependency

- The findings indicate that AI has the potential to strengthen global market integration by reducing transaction and coordination costs, facilitating digital trade, improving supply-chain management, enabling cross-border services, and supporting participation in global production networks.
- At the same time, the concentration of advanced computing, frontier models, platforms, intellectual property, investment, and specialized expertise creates new forms of technological interdependence and dependency.
- The analysis therefore identifies a dual effect of AI on global integration. AI can increase economic interconnectedness through trade, services, data, investment, and global value chains, while simultaneously increasing dependence on a relatively limited number of countries and firms for critical technological infrastructure and capabilities.

ISSN: 3108-3501
DOI: https://doi.org/10.65725/JCMCE/2/4/013

- Global market integration in the AI era therefore cannot be assessed solely through conventional measures such as trade openness and foreign investment. It must also consider technological ownership, capability distribution, platform dependence, infrastructure control, and the distribution of AI-generated economic value.
- The findings consequently suggest that AI may deepen global economic integration while simultaneously creating new forms of technological fragmentation. Economies lacking domestic AI capabilities may become increasingly integrated as users of foreign technologies without achieving equivalent control over the technologies underpinning their participation.

### 6.7 Overall Finding: The AI Democratization–Concentration Paradox

- The most significant finding of the study is that AI is simultaneously democratizing access and concentrating technological and economic power. These processes are therefore not mutually exclusive.
- At the application level, AI is becoming more accessible through cloud services, digital platforms, open-source technologies, and commercially available tools. At the foundational level, however, computing capacity, frontier research, advanced skills, investment, intellectual property, infrastructure, and major AI platforms remain substantially concentrated.

The study therefore establishes a distinction between three levels:

- **AI access** — the ability to use AI applications and services.
- **AI capability** — the infrastructure, skills, data, research capacity, investment, and technological resources required to develop and effectively utilize AI.
- **AI control** — ownership or influence over foundational technologies, computing infrastructure, intellectual property, platforms, and other critical sources of AI-related economic value.

The evidence suggests that AI access is expanding faster than AI capability and control are being distributed. This produces the central phenomenon identified in the study: "diffusion of use with concentration of capability."

This finding explains why increasing AI adoption does not necessarily eliminate technological inequality. A country can become a significant user of AI while remaining dependent on foreign providers for the foundational resources required to develop and control advanced AI.

Overall, the findings indicate that the future distribution of AI-generated economic benefits will depend substantially on whether countries and firms can move beyond AI consumption towards AI capability, innovation, value creation, and greater technological control.

In relation to the central research question, the study concludes that the global diffusion of AI is neither purely democratizing nor purely concentrating. Instead, it is producing a complex structure in which technological access is becoming broader while foundational technological and economic power remains unevenly distributed.

The decisive issue for the future of global competitiveness, international trade, economic inequality, and market integration is therefore not simply who can use AI, but who possesses the infrastructure, skills, investment, knowledge, intellectual property, and technological capabilities necessary to create and capture value from AI.

## VII. LIMITATIONS

This study is subject to certain limitations arising primarily from its reliance on secondary data and the rapidly evolving nature of Artificial Intelligence. The availability, quality, definitions, and

ISSN: 3108-3501
DOI: https://doi.org/10.65725/JCMCE/2/4/013

comparability of AI-related indicators vary across countries and international databases, making precise cross-country measurement challenging. Several important dimensions of AI capability and concentration—such as proprietary computing capacity, ownership and control of data, access to advanced models, platform dependence, intellectual property control, and the distribution of AI-generated economic rents—are difficult to measure comprehensively using publicly available information. In addition, differences in national statistical systems and reporting practices may affect the consistency of international comparisons. The study therefore focuses on identifying broad and significant structural patterns rather than claiming to capture every dimension of the global AI economy with equal precision.

A further limitation is that the study adopts a descriptive, analytical, and comparative approach based primarily on secondary evidence and therefore identifies relationships and structural patterns rather than establishing definitive causal effects. The rapid pace of technological development also means that AI adoption, investment, computing capacity, frontier models, and regulatory environments may change considerably over a relatively short period, potentially affecting the relevance of indicators over time. Moreover, the economic effects of AI differ across countries, sectors, firms, and institutional environments, making universal conclusions difficult. Despite these limitations, the use of multiple authoritative international sources, comparative analysis, and data triangulation strengthens the reliability of the findings. The study consequently provides a robust assessment of the broader democratization–concentration dynamics of AI while recognizing that future research using longitudinal, firm-level, sector-specific, and primary data could provide deeper causal and empirical insights.

## VIII. CONCLUSIONS

This study concludes that Artificial Intelligence is simultaneously broadening access to technological capabilities and concentrating the foundational resources underlying technological and economic power. The findings demonstrate that AI is becoming an increasingly important determinant of global competitiveness, international trade, global value-chain participation, economic inequality, and market integration. Although cloud platforms, open-source technologies, and commercially available AI applications have reduced certain barriers to AI adoption, meaningful participation in the AI economy continues to depend on infrastructure, computing capacity, skilled human capital, data, investment, research capabilities, and innovation ecosystems. At the same time, frontier AI development, advanced computing, investment, intellectual property, specialized expertise, and major technological platforms remain substantially concentrated. The central conclusion is therefore that AI democratization and AI concentration are not opposing outcomes occurring at different times; they are simultaneous processes operating at different levels of the AI ecosystem.

The study further concludes that the decisive distinction is between AI access, AI capability, and AI control. Wider access to AI does not necessarily translate into technological independence, higher value capture, or sustainable improvements in global competitiveness. Economies that remain primarily users of externally controlled AI technologies may participate more actively in digital markets while continuing to depend on foreign providers for critical infrastructure, models, computing resources, platforms, and intellectual property. Conversely, economies that develop complementary capabilities in infrastructure, skills, research, investment, innovation, and technological capacity are better positioned to convert AI adoption into productivity gains, trade opportunities, technological upgrading, and greater economic value capture. Thus, the future impact of AI on the global economic order will depend not simply on how widely AI is used, but on how widely the capabilities required to develop, adapt, control, and capture value from AI are

ISSN: 3108-3501
DOI: https://doi.org/10.65725/JCMCE/2/4/013

distributed. The study ultimately finds that the global AI economy is characterized by a "diffusion of use with concentration of capability," creating both opportunities for broader participation and risks of deeper technological divergence.

## IX. SUGGESTIONS

- Strengthen AI infrastructure and computing capacity: Governments should expand reliable digital infrastructure, high-speed internet, cloud access, data centres, and affordable computing facilities, particularly in emerging and developing economies. Improved access to foundational infrastructure is essential for converting AI adoption into meaningful technological and economic participation.
- Develop AI skills and human capital: Governments, universities, and industries should strengthen AI education, technical training, digital literacy, and continuous reskilling programmes. Building skilled human capital will enable countries and firms to move beyond AI consumption towards effective adoption, innovation, and value creation.
- Promote affordable and equitable access to AI technologies: Policymakers should facilitate affordable access to AI applications, cloud services, computing resources, and digital platforms for SMEs, startups, educational institutions, and developing economies. Reducing financial and technological barriers can support broader participation in the AI-driven economy.
- Build domestic AI research and innovation capabilities: Countries should increase investment in research and development, universities, innovation centres, and AI ecosystems. Strong domestic research and innovation capabilities can improve competitiveness, support technological upgrading, and reduce excessive dependence on foreign AI technologies.
- Reduce excessive concentration of critical AI capabilities: Governments and competition authorities should monitor concentration in frontier AI models, computing infrastructure, cloud services, platforms, data, investment, and intellectual property. Appropriate competition policies should encourage market access, interoperability, innovation, and opportunities for smaller firms and new entrants.
- Strengthen support for SMEs and developing economies: Targeted financing, technical assistance, training, shared computing facilities, and innovation programmes should be provided to SMEs and firms in emerging and developing economies. Such measures can help overcome financial, infrastructural, and knowledge barriers to productive AI adoption.
- Promote AI-enabled upgrading in global value chains: Governments and industries should focus on developing capabilities that enable domestic firms to move into higher-value activities such as advanced manufacturing, digital services, software development, research, design, and knowledge-intensive exports. This can increase domestic value capture and reduce dependence on low-value activities.
- Support inclusive participation in AI-enabled international trade: Trade and development policies should facilitate access to digital markets, digitally delivered services, technology transfer, digital infrastructure, and cross-border economic opportunities. This can enable emerging and developing economies to expand exports and participate more effectively in AI-enabled global value chains.
- Ensure fair and inclusive distribution of AI-generated benefits: Policymakers should complement AI adoption with employment transition support, reskilling, social protection, and inclusive innovation policies so that productivity and technological gains translate into

ISSN: 3108-3501
DOI: https://doi.org/10.65725/JCMCE/2/4/013

broader economic opportunities. This is important for preventing AI-driven technological progress from widening international and domestic inequalities.

- Strengthen data governance and intellectual-property capabilities: Countries and firms should develop secure data infrastructure, effective data-governance systems, and stronger domestic intellectual-property capabilities while ensuring responsible data use. These capabilities can strengthen innovation and improve the ability to create and capture value from AI.
- Promote responsible AI governance and balanced technological interdependence: Governments and international organisations should establish adaptable frameworks addressing transparency, accountability, competition, data governance, intellectual property, safety, and responsible AI deployment. Countries should simultaneously strengthen domestic AI capabilities while maintaining international technology, trade, investment, and research cooperation, thereby promoting resilient interdependence rather than technological isolation or excessive dependency.
- Monitor AI concentration, dependency, and global capability gaps: International organisations and governments should regularly assess disparities in computing capacity, frontier AI development, investment, research talent, patents, platforms, and technological ownership. Monitoring should distinguish between AI access, AI capability, and AI control, since high adoption alone does not demonstrate genuine technological independence or democratization.
- Develop comprehensive measures of AI democratization and value capture: Researchers and international institutions should develop multidimensional indicators covering AI adoption, infrastructure, computing capacity, skills, research, investment, intellectual property, domestic innovation, platform dependence, and economic value capture. Such measures would provide a more accurate assessment of whether AI capabilities are genuinely becoming more widely distributed.
- Strengthen international cooperation for inclusive AI development: Advanced, emerging, and developing economies should expand cooperation in technology transfer, research, skills development, infrastructure, financing, and knowledge sharing. International cooperation is essential for reducing global disparities in AI capabilities and preventing technological fragmentation and excessive dependency.
- Expand future empirical research on the AI democratization–concentration paradox: Future studies should use larger cross-country, firm-level, sector-specific, and longitudinal datasets to examine how AI access, capability, and control influence productivity, competitiveness, trade, global value-chain upgrading, investment, employment, inequality, and technological dependence. Such research can provide stronger evidence on whether AI contributes to global economic convergence or reinforces technological divergence.

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