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THE A.I. PARADIGM: CRAFTING SUSTAINABLE GROWTH FOR AN INTELLIGENT ECONOMY

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THE A.I. PARADIGM: CRAFTING SUSTAINABLE GROWTH FOR AN INTELLIGENT ECONOMY

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Abstract

Artificial intelligence (A.I.) is arguably the most transformative technological advancement of the 21st century. The disruptive technology promises a dangerous crossroads of economic opportunity and productivity, and economists are unable to reach a consensus regarding the long-term implications of such innovation. This paper discusses the current state of A.I. deployment, comparative regional differences in economic development, and sector-specific impacts of A.I. adoption. We identify and address three policy concerns: implementation lag, monopolistic structures, and labor market effects. Throughout, a keen emphasis is placed upon equitable and progressive growth for stakeholders at all levels—a core tenant of any high-quality economy.

1. Introduction

At the precipice of the Internet Revolution and eventual dot-com boom, critic Clifford Stoll of Newseek cooly professed: "The Internet? Bah!... no online database will replace your daily newspaper." Nearly three decades later, as the physical paper has been rendered all but obsolete, a new technological development stands at similar crossroads of tidal change. A.I. has taken the global economy by storm, fueled by the mass popularization of readily accessible consumer tools such as OpenAI's ChatGPT.

Differing viewpoints have emerged regarding the growth potential of this disruptive new technology. Overall, economists agree that A.I. has short-run microeconomic benefits to productivity, but whether these gains persist in the long run is prevalently debated (Farraj 2024). Proven short-run successes include the use of generative A.I. in writing and computer programming, career training and development for workers, and data processing (Filippucci et al. 2024). However, current literature suggests that A.I. precipitates negative implications in market prices, social inequality, and unemployment. A.I.-powered algorithms have a tendency to charge supra-competitive prices (Calvano et al. 2020); monopolization by tech giants can lead to harmful ramifications, including destructive price discrimination strategies (OECD 2018). Filippucci et al. (2024) posit that without the implementation of sufficient policy, labor market shifts will perpetuate and exacerbate wealth inequality. However, the most prevalent concern – as cited in current literature and in the media writ large – is A.I.'s potentially disastrous effect on the job market.

McKinsey suggests that between the six-year span of 2024 to 2030, over 12 million transitions will occur in the United States due to A.I., a number similar to those that were estimated to be displaced from the COVID-19 pandemic (Ellingrud et al. 2023). Therefore, workers in roles with diminishing demand are forced to find new jobs as A.I. developments increasingly substitute their roles held during previous employment. This effect is especially pronounced in four leading industries: (1) administrative assistance, (2) customer service, (3) food service, and (4) manufacturing. For context, 85% of A.I.'s aggregate impact consists of effects in these industries (Ellingrud et al. 2023). Additionally, contrary to previous industrial and technological developments, A.I. is set to specifically impact white-collar workers in the years to come (Muro et al. 2020).

The rapidly developing presence of A.I. in the American economy shares many similarities with historical technologies, with Web3 and cloud computing serving as key comparators (Kalyani & Hogan 2024). Several intrinsic aspects of A.I., however, differentiate it from implications borne by preceding technologies. Federal Reserve reports reveal additional nuances, suggesting that even workers in the top 10% of wage distributions may be significantly complemented and substituted by A.I. (Pranger & Su 2023). Specifically, A.I. technologies have been proven to augment human capabilities, thereby allowing workers to focus on higher-level tasks; A.I. can easily automate data analysis, allowing employees to focus their attention on interpreting results and making strategic decisions (Zirar et al. 2023). It is apparent that the impacts of A.I. will permeate through all corners of the economy such that even work previously assigned to highly educated professionals may be automated.

In this paper, we discuss the recent, rapid, and disruptive evolution of A.I. and propose a three-fold policy recommendation that balances efficient development with preserving an equitable, wholly participatory global economy.

2. On the State of A.I. Deployment

Current approaches to A.I. integration in the economy have staggered because of an elaborate digital economy. The global economy is filled with germinating complexities in economic activity, transactions, and interactions within the digital sphere (Digital Cooperation Organization, 2024). As a result, governments are hesitant to rapidly integrate A.I. technology due to a fear of widening the digital divide. Accelerating digital adoption poses a significant threat to wealth equality, which has led to hesitation among major economic institutions, including retail banks, of which, only 6% have the current capacity to adopt A.I. (Capgemini 2024; WorldBank 2023). Additionally, rapid development has led to pullback from governments because of security and regulatory concerns. A.I. development now outpaces regulatory abilities, leading governments to slow or stop deployment (Farraj 2024). In 2023, the United States saw its largest issuance of A.I.-regulated regulations to-date; ten of the thirteen were restrictive rather than expansive. Much regulatory concern is propagated by security concerns with personal data and privacy. Companies and governments alike are reluctant to accelerate A.I. deployment without first deploying security measures and mitigating risks (Digital Cooperation Organization, 2024). In short, the uncertainty of A.I. deployment has led to pullback and staggered deployment because of safety concerns and fear of uncertainty.

3. Prospective Approaches to Deployment

Because of A.I. growth–caused by streamlined manufacturing and widespread use from Amazon, Microsoft, and Google (Laserfiche, n.d.)—cloud platforms have the capacity to provide equitable access to A.I. to small businesses, boosting economic growth. Microsoft Azure, Amazon AWS, and Google Cloud provide mediums for small businesses and those in emerging economies to access A.I. without exorbitant infrastructure investments (Brynjolfsson & Mitchell, 2017). Cloud computing will allow smaller businesses to bolster economic investment at a lower cost because such technology meets demand without requiring firms to build hardware infrastructure. Therefore, A.I. deployment through cloud computing is posited to have lower barriers to entry in the economy, uniquely boosting long-run aggregate productivity through a larger accessibility radius (in comparison to expensive technologies such as quantum computing).

Furthermore, A.I. development will certainly trigger significant changes in labor economics because of changing demand for skills. A.I. development alone will serve as job creation; demand for developers and manufacturers has rapidly increased and is predicted to continue to do so into the future (Acemoglu & Restrepo, 2018). With increased labor demand for development, maintenance and oversight demand will subsequently increase to ensure successful economic integration. As of 2023, Python (programming language), Computer Science, SQL (programming language), Data Analysis, and Data Science topped the most frequently referenced specialized skills A.I. job postings (A.I. Index Report, 2024). Additionally, worker skills must change as labor shifts from physical labor to maintenance of AI that serves as a form of physical capital. These effects culminate in increased economic productivity. For example, AI can take the menial roles of labor, while human capital is invested in development and maintenance. This shift creates higher-level job opportunities for skill creation to boost worker incomes and transform the economy.

4. Long-Term Growth Estimation from an Endogenous Perspective

4.1 Romer's Endogenous Growth Model

The distinct recency surrounding A.I. development has inhibited research on its implications with regards to long-term economic growth. Studies conducted thus far have gleaned micro-level evidence demonstrating promising productivity gains, yet, A.I.'s long-run impact on macro-level productivity remains uncertain (Filippucci et al. 2024). Limited data constrains our wherewithal to support an evidence-based assertion. Alternatively, we can attempt to estimate the impact that A.I. will have on the economy through utilizing tried-and-tested paradigms. Romer's Endogenous Growth Model stands as a discernable choice for carrying out such an estimation, thanks to its emphasis on innovation, technology, knowledge spillovers, and entrepreneurship — forms of intellectual capital that are seeing increasing prevalence and investment amidst the age of A.I.

Romer's Model differs from Neoclassical Growth Theory – most notably, the Solow-Swan Model – in that it posits an *endogenous*, rather than *exogenous*, perspective to long-term growth (Romer 1994). The latter hypothesizes that economic growth is catalyzed by a series of independent external forces – returns on investment, capital accumulation, and steady-

state technological variables – whereas the former accounts for research and development (R&D), human capital, and the innovation resulting therewithin. Extracting key equations from Romer's 1994 work, "The Origins of Endogenous Growth," we can begin considering how A.I. may affect long-term aggregate growth and output. Below, Romer's endogenous interpretation of economic growth is outlined in a series of foundational expressions:

Original Output Production Function

$$Y_t = A_t K_t^{\alpha} L_t^{1-\alpha}, \tag{1}$$

Where: Y = total output; A = level of technology/knowledge; K = capital stock; L = labor input; α = output elasticity of capital; and t = time. Note: K and L are inputs in the R&D sector.

Original Technology Production Function

$$\Delta A = \delta A_t L_{A_t}, \tag{2}$$

Where: ΔA = change in level of technology/knowledge; and δ = productivity of research efforts.

We can derive the following:

Growth Rate of Technology

$$g_A = \frac{\Delta A}{A} = \delta L_{A_t} \tag{3}$$

Long-Run Growth Rate

$$g_Y = g_A = \delta L_{A_t} \tag{4}$$

4.2 Empirical Data and Regional Differences

Using standard least squares regressions, we evaluated the regional differences in A.I. investment and growth for the United States and China - key players in the global "AI Race" (https://www.ncuscr.org/podcast/us-china-ai-race/, 2023). Examining the relationship between Corporate Investment in A.I versus GDP per Capita, the United States yielded a line of best fit of $y = 0.14862902622666577x + 69.1965180100348$ and China of $y = 0.11980903005969315x + 10.015287051608665$. With r-squared values of 0.9686 and 0.8096, respectively, we find that there is a clear, positive correlation between spending on A.I. and annual economic output, validating Romer's Original Output Production Function.

There is an implementation time lag between A.I. development and market implementation - and subsequently, economic growth. Thus, we are unable to empirically prove that increasing investments into A.I. will precipitate long-run economic growth. We can, however, take note that corporate A.I. investments have grown substantially in the last decade and hypothesize the impacts that such investments will have on aforementioned long-run economic

growth, according to the expression (4) that we derived from Romer's Model. Corporate A.I. investment diffuses into two categorizations, roughly: capital stock (K) and labor input (L). Assuming that as corporate A.I. investment increases, that its constituent labor input increases as well, we can predict that long-run economic growth will increase thereafter, with expression (4) modeling this effect.

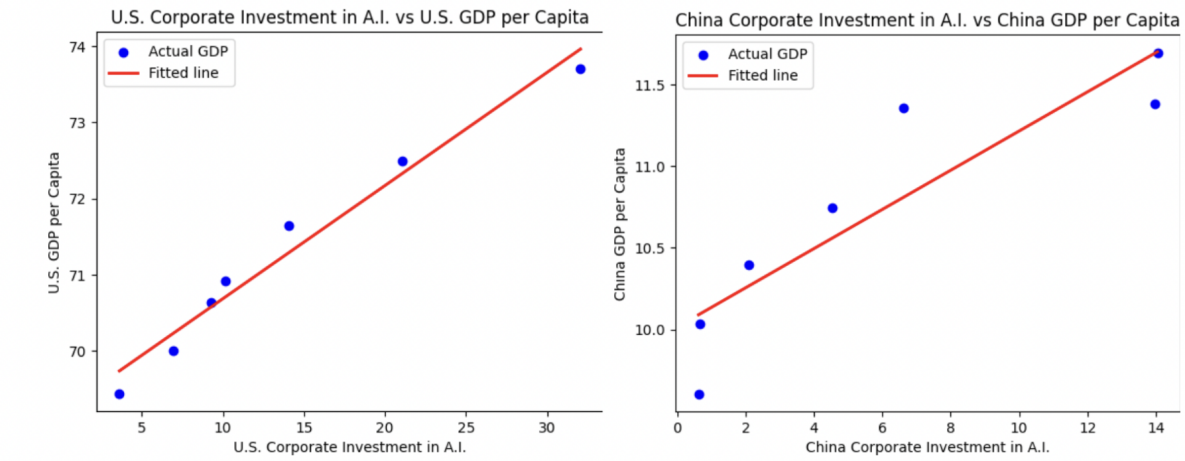

Fig. 1.— Comparison of the correlation between a nation's corporate investments in A.I. technologies with the attributed growth in GDP per capita with the United States (left) and China (right). Data is sourced from the Stanford University Human-Centered Artificial Intelligence (HAI) (2024).

Another insight that we draw from our regressions is that the United States and China have seemingly different trajectories with A.I. development. With a slope of 0.14862902622666577, the United States appears to have a roughly 24% lead over China in terms of improvement in GDP per Capita per dollar invested into A.I. This illustrates a difference in the two countries' δ, or productivity of research efforts - another variable in the derived long-run growth rate expression shown above (4). We predict that, ceteris paribus, the United States will see a greater increase in long-run growth rate than China will, even if the latter catches up to the former in terms of scale of investment.

5. Sector-Specific Implications

A.I. deployment has varied effects segmented across distinct economic sectors. In practices where A.I. complements or improves current operations, productivity is increased; conversely, in sectors where deployment creates job displacement of economic dependency, productivity is hampered. In manufacturing, A.I. can bring efficiency to emerging markets. Factory floors now operate with increased efficiency, productive capacity, and automation due to robotic integrations and novel value chain creation (Manchanda et al. 2024). Increased manufacturing capabilities suggest A.I. is catalyzing emerging markets, creating increasingly complex and integrated processes.

In the technology and infrastructure fields, the Manchanda et al. (2024) reports that the increased capacity of cloud computing is making computing infrastructure more affordable

and accessible for various markets. Historically, critical market players with a capacity to leverage new technologies gain a comparative advantage in expanding market growth. For example, A.I. developments through market manufacturers like NVIDIA have brought advancements in supply chain logistics. NVIDIA has created a streamlined supply chain in the field of A.I., creating a near monopolistic chip manufacturing outlook, with products sourced across Apple, Microsoft, Meta, and Google. NVIDIA has full control over the A.I. supply chain (Chauhan 2024), displaying how entire sectors such as technology, social networking, and personal computing can directly be influenced and impacted downstream.

6. Development Through a Stage Lens

A.I. implementation could cause uneven impacts and progressions through Rostow's Stages of Economic Growth. According to Bughin et al. (2018), advanced economies in Rostow's final stage of "high mass consumption" are likely to experience accelerated growth due to effective A.I. deployment. Stronger and more developed economies can better harness A.I. due to established infrastructure and a highly concentrated ownership of capital (Im 2024). Such large shifts in productivity would imminently fray the economic scale between developed and developing nations. Analyses concur that the discrepancy between advanced economies (60% of jobs potentially impacted), emerging markets (40%), and low-income countries (20%) exhibits a widening gap in economic productivity (Bughin et al. 2018). This consensus aligns with Rostow's Stages of Economic Growth. International institutions agree that with their brittle networks of developed infrastructure and skilled workers, developing economies in earlier stages of Rostow's model are more prone to challenges in both deploying and effectively governing A.I. systems (Georgieva 2024).

7. Comparative Regional Analysis

A.I.'s impact on productivity will inevitably differ across the global sphere due to the inherent dissimilarities in regional economies. North America and China stand to reap the most benefits from A.I. development and deployment.

Aptly put, North America is prepared to adopt A.I. at scale with efficient integration into their economic systems (Szczepański 2019). The region has perched on the forefront of A.I. research and development, with many educational institutions driving research and technology corporations deploying practical innovations derived, in part, from such knowledge (Allison & Schmidt 2020). Streamlined development and effective supply chain management provides North America a comparative advantage.

China has also proved ready to rapidly deploy A.I. technologies to bolster their continuously growing economy. China's substantially robust manufacturing sector provides an exceptional opportunity to leverage A.I. and increase production efficiency (Szczepański 2019). The Chinese government has also deemed A.I. a national priority. In 2020, China unveiled a five-year, $1.4 trillion dollar investment plan for A.I. infrastructure and technology (PYMNTS 2024). With rising and demonstrated investment, economic productivity is ripe to increase in China. China is specifically leveraging A.I. investment in autonomous vehicles. Level 4 autonomous vehicles are expected to reach significant adoption by 2030, with Xiaomi expecting to ship over 100,000 units in 2024 (J.P. Morgan Research 2024).

While North America and China remain well-positioned to harness the economic benefits from A.I., broad economic regions across the globe will also witness increases in productivity.

8. Policy Recommendations

8.1 Fixing Implementation Lag

Compared to previous technological developments like smart devices and cloud computing, A.I. deployment is uniquely experiencing significant roadblocks. As previously referenced, three factors principally establish this lag: (1) A.I. incompatibility with existing systems, (2) regulatory compliance, and (3) professional guidance shortages in the market.

First, A.I. implementation is an expensive and challenging endeavor as institutions are forced to overhaul current systems, creating time-consuming and arduous new tasks for workers. Without recognizable short-term incentives to upgrade systems, most businesses may not deploy novel A.I. technologies (Bughin et al. 2018). Therefore, creating a government-backed "A.I. Integration Incentive Program" could push businesses to put A.I. into practice. For example, subsidies for small-medium enterprises (SMEs) would effectively offset the costs of A.I. overhauls. This model would increase productivity in the long run as businesses adopt more efficient investments in A.I and prioritize structural economic growth over short-run costs.

Second, regulatory compliance has staggered A.I. deployment. Firms are cautious about implementation due to ambiguous regulatory guidelines that inhibit prudent decision-making and investment strategies. This reluctance prevents productivity growth. A "Regulatory A.I. Sandbox," in which businesses can test A.I. applications with relaxed regulatory guidelines, may prove to be an effective novel solution. This approach would allow for a gradual implementation model where firms could make technological advances while developing clear, adaptive guidelines tailored to firm-specific investments. To track legal progression, an independent A.I. Ethics Committee could be formed intra-firm to provide impartial oversight and guide ethical implementation of A.I. technologies. If achieved under ethical circumstances, promoting and developing A.I. integration into the economy could prove a transformational shift. With a streamlined approach to regulatory compliance, A.I. integration bolsters economic productivity.

Finally, lack of professional guidance has resulted in sluggish A.I. deployment through a two-fold mechanism. First, as organizations and firms often lack the necessary expertise to implement A.I. effectively, they may abandon such efforts altogether in perceptual fear of inept governance. Second, if deployed inefficiently, A.I.'s costs may indeed outweigh its benefits as high adoption barriers surpass productivity gains. Firms can create an "A.I. Workforce Development Initiative (WDI)" to mitigate such issues. The WDI would allow market leaders, including universities and technology corporations, to create skill advancement initiatives. Governments could create accessibility by providing tax credits to smaller firms looking to gain experience through such advancement opportunities. Apprenticeship programs could bridge the divide between education accessibility and industry demands. By crowdsourcing community and industry leaders, productivity could be improved through joint programs. This robust quilt of additional expertise would provide newer firms both

the confidence and technical know-how to effectively implement A.I. systems, resulting in long-run gains to economic productivity.

8.2 Alleviating Monopolistic Structures

The current trajectory of A.I. development, as previously explicated, favors mature economies. This will exacerbate geographic inequalities in the long-run (Bughin et al. 2018).

One solution to alleviate such an impending global wealth disparity is through a "Global Equity Fund." Such a fund, implemented transnationally across an institutional level, would operate by developed nations investing in A.I. infrastructure in other countries. Although this solution may face challenges securing funding from both governments and private players, the plan would offer a concrete mechanism to improve A.I. knowledge sharing across borders. Strategic incentives could be incorporated, such as fractional equity ownership in investments or the promise of public-private partnerships, aligning incentives between stakeholders. This may ultimately address the resource gap between developed and developing nations. With increased access to A.I. technologies and market share, firms could increase productivity, allowing for emerging parties to drive long-term growth.

Furthermore, public institutions could implement strategic A.I. competition frameworks and legislation. With a wide breadth of intellectual patents or privatized access to new technology, the rise of market barriers may breed monopolistic scenarios. Targeted anti-trust legislation in the realm of end-to-end A.I. development and technology processes could prevent monopolization and inequitable development. In order to triangulate the careful balance between prohibiting innovation and regulating competition, governments could utilize frameworks such as value-based pricing and small-business subsidies. As regulation is prudently implemented, market barriers gradually collapse and new players emerge, boosting productivity and economic growth. Data-sharing requirements also offer an ancillary approach to fostering fair competition. After an established expiration of select private corporation trade data, governments could monitor market inequalities and bolster intra-firm competitive innovation. Alternatively, structured incentives could be framed to encourage open-source A.I. tools. For example, policy agendas may argue that democratized access would bolster the growth of emerging firms, allow new firms to enter the market, and subsequently industry-wide growth that benefits all players.

Lastly, international A.I. governance bodies could set universal standards into equitable development. Namely, the UN's High-Level Advisory Board on Artificial Intelligence, which has set global standards for A.I. deployment, should continuously liaise with a diverse swath of geographic locales and A.I. sectors to reach a consensus on effective governance. Similar organizations could follow suit in declaring standard global values for development, deployment, and utilization of A.I., reducing regulatory fragmentation. Such standardization would boost market productivity as firms are provided reliable regulatory information to pursue development objectives, reducing fear of international expansion repercussions due to varied norms. Additionally, this could incentivize collaboration between countries, accelerating A.I. investment and growth by pooling resources from member nations. Countries could, in tandem, introduce market leader expertise to other nations, resulting in iterative optimization and a cross-pollination of paradigms that promotes maximum efficiency and equitable

distribution. Developing countries may especially benefit from the democratization of veritable information and insight across the world. Therefore, global A.I.-governing bodies could increase efficiency in A.I. advancement, leading to increased productivity.

8.3 Improving Effects on Individual Workers

The prospective impact of A.I. on the workforce is, indisputably, one of the primary concerns associated with widespread deployment of technologies (Shen & Zhang 2024).

The effects of A.I. on individual workers are multifaceted and can be compartmentalized into distinct buckets. First, wage gaps may rise substantially; employers could utilize technologies as a "zero-sum game" in which low-skilled jobs are automated away and higher-skilled, high paying workers increasingly transition to qualitatively dependent, intellectual tasks (Bivens & Zipperer 2024). This cost-cutting trend could result in decreased economic mobility for low-income individuals, as well as a sharp decline in the labor force participation rate sans carefully constructed policy measures. We propose two potential solutions.

First, universal A.I. training programs can ensure workers have foundation A.I. skills and expertise. This would help ensure A.I. developments do not overhaul neither the job market nor any individual's established career trajectory. By imprinting new skills in A.I. utilization, human capital becomes a supplement rather than a replacement of A.I. In practice, however, no single policy measure can wholly mitigate the harmful implications of advancement. There will exist a non-zero increase in frictional unemployment. Job transition and assistance programs can be implemented to support workers who have been displaced and are seeking new roles. In addition, A.I.-powered matching algorithms could, ironically, be used to optimally match workers to jobs.

Second, proactive measures such as taxation would disincentivize mass automation of human processes. This could be packaged as progressive A.I. taxation and a "Social Safety Net"' that scales alongside the level of job displacement associated with A.I. Companies that benefit the most from automation and a reduced human workforce would pay correspondingly higher taxes, reducing lay-offs. Such taxes would serve to balance the economy and mitigate unemployment as businesses are decreasingly incentivized to invest in A.I. at the expense of human capital. Thus, to prevent rampant unemployment and ensure productivity, progressive taxes would complement the introduction of A.I. into the workforce. Such tax revenues may even underpin an A.I. career adoption program at post-secondary and higher education institutions alike. This would enable future generations to smoothly integrate into a fully functional post-A.I. society.

Third, retroactive monitoring can optimize public policy considerations. Periodic examinations and evaluations of national job vacancies can reveal important trends in reduced hiring and labor force statistics, particularly in low-skill, non-A.I. positions. Accordingly, governments at all levels of the bureaucracy could tune policies to preserve labor force participation while bolstering per capita productivity. For example, workers could be re-trained in niche programs for both distinct roles and A.I.-complementary positions (where A.I. enhances work completed), as opposed to simply allowing new technology to overshadow and outcompete them. A novel category of public sector workers, including specialized data sci-

entists and AI/ML researchers, should be employed to judiciously create dynamic feedback loops within policy-making processes; this would enable the subtle calibration of initiatives based on nuanced indicators of economic health and technological integration.

9. Conclusion

In this paper, we examine the recent evolution of A.I. technologies and propose solutions to hedge against potential risks at both the micro and macroeconomic levels with a three-pronged approach to policy implementation.

To contextualize, the mass consumerization of generative tools has catalyzed discourse regarding the true implications of A.I. on society writ large. Economists are generally in agreement with the short-run productivity gains of A.I., but there remains no consensus on long-run implications to the labor market, social inequality, and unemployment alike. While comparators such as Web3 and cloud computing can offer guidance in the revolutionary potential to improve productivity, A.I. is uniquely positioned to affect, augment, and perhaps even replace human capabilities.

With a definitive lack of clarity, governments across the world have staggered A.I. integration, leading to both policy and technological fragmentation. First, this fragmentation persists intrastate across sectors—with the robotics, manufacturing, and technology fields most ripe for disruption. Second, interstate development is also likely to be marred with inequity as developed economies can better harness A.I. infrastructure. We performed a standard least squares regression and found that the U.S. and China are global leaders in efficient A.I. investment and growth (correlative inference between A.I. investment and Country GDP per Capita).

However, A.I. deployment, if complemented with cloud computing platforms, can decrease inequitable growth by reducing barriers to entry for smaller market players. An approach we suggest to track this effect, as long-run A.I. development data becomes more readily accessible, is the utilization of Romer's Model and similar endogenous perspectives that account for intentional human investments in innovation. To effectively mitigate these disparities and foster a more equitable technological landscape, we propose three comprehensive policy recommendations. First, bridging the gap in A.I. implementation. Governments should subsidize investment costs for SMEs, clarify and allow safe experimentation of A.I. regulations, and push for workforce development initiatives. Second, alleviating monopolistic scenarios. Public sector stakeholders should consider strategic A.I. competition frameworks, collaborate internationally for universal and concretized norms, and work towards a Global Equity Fund. Finally, national governments should offer readily-accessible A.I. training programs, disincentivize mass automation of human processes, and retroactively monitor policy efficacy.

Our world stands at a century-defining crossroads of tidal change with the revolutionary potential of artificial intelligence. Without ethical governance and prudent implementation, A.I.'s effects on economies across the globe, and especially on individual workers, may prove catastrophic. We urge robust discourse on technological public policy suited for 21st-century stakeholders and call on public leaders to rigorously examine the niche implications that A.I. presents. With cooperation and intentional decision-making regarding A.I. public

policy, immense economic growth and productivity gains may await. In such a scenario, it is appropriate to assert that a rising tide may lift all boats—but it may just as easily result in the swamping of vessels ill-equipped to navigate turbulent waters ahead.

References

Allison G., Schmidt E., 2020, Is China Beating the U.S. to AI Supremacy?, https://www.belfercenter.org/publication/china-beating-us-ai-supremacy

Bivens J., Zipperer B., 2024, Unbalanced labor market power is what makes technology—including AI—threatening to workers: The best "AI policy" to protect workers is boosting their bargaining position, https://www.epi.org/publication/ai-unbalanced-labor-markets/

Bughin J., Seong J., Manyika J., Chui M., Joshi R., 2018, Notes from the AI frontier: Modeling the impact of AI on the world economy, https://www.mckinsey.com/featured-insights/artificial-intelligence/notes-from-the-ai-frontier-modeling-the-impact-of-ai-on-the-world-economy

Calvano E., Calzolari G., Denicolò V., Pastorello S., 2020, American Economic Review, 110, 3267

Capgemini 2024, Only 6% of retail banks have built an enterprise roadmap to drive AI-driven transformation at scale, https://www.capgemini.com/news/press-releases/only-6-of-retail-banks-have-built-an-enterprise-roadmap-to-drive-ai-driven-transformation-at-scale/

Chauhan H., 2024, Is This the Beginning of the End of Nvidia's Artificial Intelligence (AI) Chip Dominance?, https://www.nasdaq.com/articles/is-this-the-beginning-of-the-end-of-nvidias-artificial-intelligence-ai-chip-dominance

Ellingrud K., Sanghvi S., Singh Dandona G., Madgavkar A., Chui M., White O., Hasebe P., 2023, Generative AI and the Future of Work in America, https://www.mckinsey.com/mgi/our-research/generative-ai-and-the-future-of-work-in-america

Farraj Y. A., 2024, What are the global digital economy trends in 2024?, https://economymiddleeast.com/news/global-digital-economy-trends-2024-2/

Filippucci F., et al., 2024, OECD artificial intelligence papers

Georgieva K., 2024, AI Will Transform the Global Economy. Let's Make Sure It Benefits Humanity., https://www.imf.org/en/Blogs/Articles/2024/01/14/ai-will-transform-the-global-economy-lets-make-sure-it-benefits-humanity

Im H.-J., 2024, How to Adopt AI Step-By-Step for Your Business [Complete Roadmap], https://www.proserveit.com/blog/how-to-adopt-ai-step-by-step

J.P. Morgan Research 2024, How AI is shaping industries in China, https://www.jpmorgan.com/insights/global-research/artificial-intelligence/ai-transforming-industries-china

Kalyani A., Hogan M., 2024, AI and Productivity Growth: Evidence from Historical Developments in Other Technologies, https://www.stlouisfed.org/on-the-economy/2024/apr/ai-productivity-growth-evidence-historical-development-other-technologies

Manchanda S., Kaleem H., Schlorke S., 2024, EmCompass Note 87, AI Investments Allow Emerging Markets to Develop and Expand Sophisticated Manufacturing Capabilities, https://www.ifc.org/content/dam/ifc/doc/mgrt/emcompass-note-87-for-web.pdf. International Finance Corporation, https://www.ifc.org/content/dam/ifc/doc/mgrt/emcompass-note-87-for-web.pdf

Muro M., Whiton J., Maxim R., Gaynor M., 2020, Interactive: What Jobs is AI Likely to Disrupt?, https://www.brookings.edu/articles/interactive-what-jobs-is-ai-likely-to-disrupt/

OECD 2018, OECD Science, Technology and Innovation Outlook 2018

PYMNTS 2024, China's AI Surge Could Impact the Global Business Landscape, Experts Say, https://www.pymnts.com/artificial-intelligence-2/2024/chinas-ai-surge-could-impact-the-global-business-landscape-experts-say/

Pranger A., Su Y., 2023, New Disruption from Artificial Intelligence Exposes High-Skilled Workers, https://www.dallasfed.org/research/swe/2023/swe2314

Romer P., 1994, Journal of Economic Perspectives, 8, 3

Shen Y., Zhang X., 2024, Humanities and Social Sciences Communications, 11, 1–14

Stanford University Human-Centered Artificial Intelligence (HAI) 2024, Technical report, Artificial Intelligence Index Report 2024, https://aiindex.stanford.edu/wp-content/uploads/2024/05/HAI_AI-Index-Report-2024.pdf. Stanford University, https://aiindex.stanford.edu/wp-content/uploads/2024/05/HAI_AI-Index-Report-2024.pdf

Szczepański M., 2019, BRIEFING EPRS — European Parliamentary Research Service In this Briefing Context Economic potential of AI Impact of AI on manufacturing Effects of AI on firms, industries and countries AI impacts on labour markets and redistributive effects of AI Selected policy implications of AI, https://www.europarl.europa.eu/RegData/etudes/BRIE/2019/637967/EPRS_BRI%282019%29637967_EN.pdf

WorldBank 2023, Digital Progress and Trends Report, https://openknowledge.worldbank.org/server/api/core/bitstreams/95fe55e9-f110-4ba8-933f-e65572e05395/content

Zirar A., Ali S. I., Islam N., 2023, Technovation, 124, 102747