Artificial Intelligence in Qatar: Assessing the Potential Economic Impacts

Tongfang Yuan

2025
MAR

IMF Selected Issues Paper
Middle East and Central Asia Department

**Artificial Intelligence in Qatar: Assessing the Potential Economic Impacts
Prepared by Tongfang Yuan**

Authorized for distribution by Ran Bi
March 2025

ABSTRACT: Qatar has been actively preparing to embrace the transformative potential of artificial intelligence (AI), allowing it to lead its Emerging Market peers in AI readiness. Qatar's AI exposure has increased significantly over the years, and increasing AI adoption is assessed to yield more opportunities than risks for the country's labor force, thanks to the private sector's contribution in increasing jobs that are more likely to benefit from AI-driven productivity gains. Scenario analyses suggest that increasing AI adoption, supported by policy reforms to boost human capital, innovation and domestic knowledge spillovers, could generate sizeable labor productivity gains over the medium term.

Artificial Intelligence in Qatar: Assessing the Potential Economic Impacts

Qatar

Prepared by Tongfang Yuan [1]

A. Context: Qatar's AI Readiness

1. **The world has seen an acceleration of Artificial Intelligence (AI) development and adoption in the past few years.** The share of companies adopting AI technologies around the world has more than doubled, from 20 percent in 2017 to 55 percent in 2023. Global private AI investment has expanded five times, from less than $20 billion in 2014 to approximately $100 billion in 2023 (Stanford). According to PWC estimates, AI has the potential to contribute up to $277 billion to the GCC region by 2030, driven mainly by labor productivity gains and consumption side stimulus.

2. **Qatar has been proactive in strategic planning for the transformative potential of AI, moving relatively early with high-level initiatives.** In 2019, the country launched its first National AI Strategy, focusing on six key sectors: education, data access, employment, business, research, and ethics. This was followed by the establishment of the Artificial Intelligence Committee in 2021, which includes representatives from various ministries, universities, and financial institutions to coordinate AI governance and policy. The national Digital Agenda 2030 reinforces this commitment by positioning AI as a crucial driver of digital transformation across sectors such as government services, healthcare, and finance. The Agenda also lays out AI-specific initiatives (see below) and workforce upskilling programs, supporting the sustainable economic growth objectives in the Third National Development Strategy (NDS3) and Qatar National Vision 2030.

3. **Qatar's AI strategies are underpinned by a range of initiatives in digital talent, digital infrastructure, government services, and investments.**

- **AI digital talent:** Qatar launched a number of talent development programs in its Digital Agenda 2030. For example, the National Skilling Program, launched in collaboration with Microsoft, is aiming to train 50,000 individuals in advanced digital competencies, including AI and data science by 2025. The Digital Talent Development and Retention Program complements this effort by encouraging local talent to pursue careers in technology through attractive opportunities and incentives, while a fast-track visa system is being introduced to attract global experts in the field. AI research outputs have also surged, with Qatar University being the nation's leading research institution on AI (Figure 1).

- **AI computing infrastructure**: With the rise of large AI models necessitating advanced computing, Qatar is prioritizing the development of high-performance computing (HPC) and planning to establish a National HPC Program to expand cloud-based capabilities for AI, supporting research and new revenue streams. On data centers, Qatar witnessed an annual growth of 45 percent over the last decade, reaching total capacity of 23.5 Megawatts (MW).

Text Figure 1. Qatar: AI Research by Qatari Institutions
(Number of publications, cumulative)
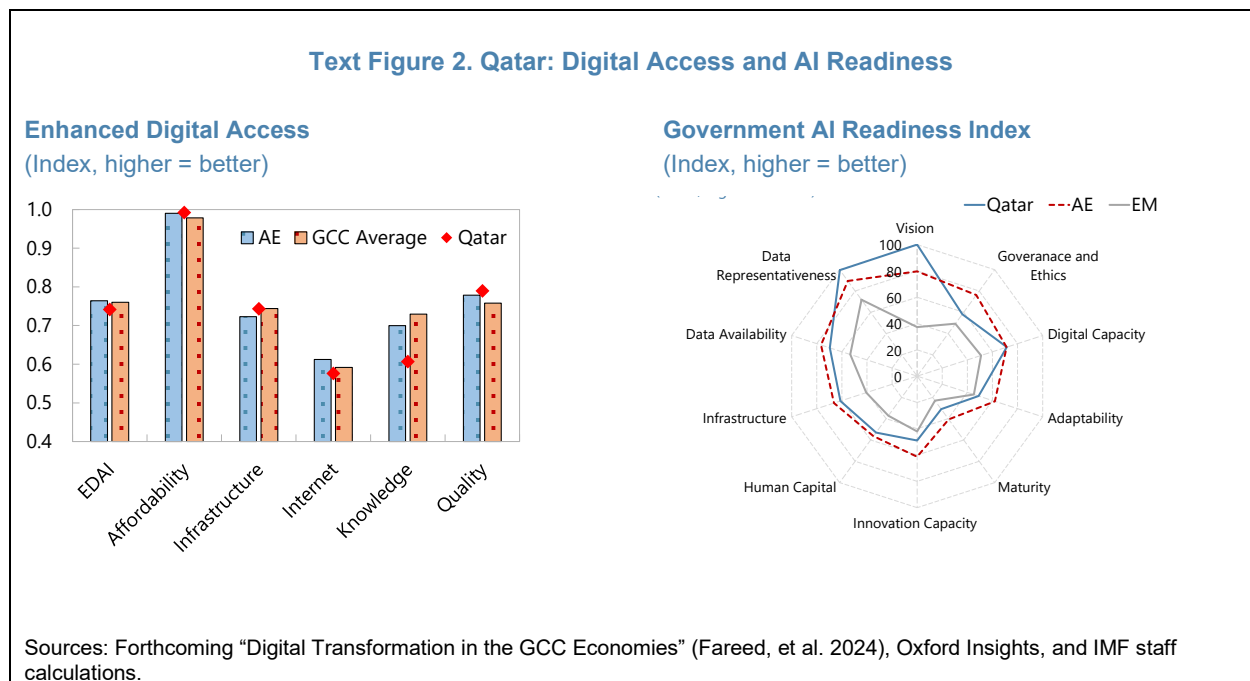
Sources: OECD.AI, and IMF staff calculations.

- **AI for public and labor market services**: For example, the TASMU Smart Qatar program utilizes AI and analytics to meet national goals
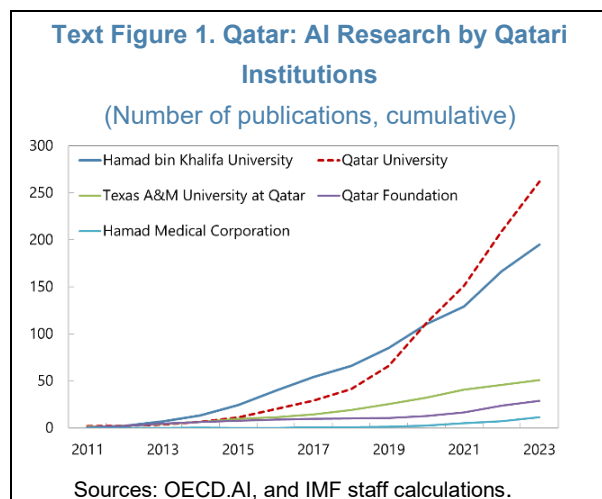
such as food security and infrastructure optimization. The Labor Market Information System (LMIS) employs AI to provide insights into labor dynamics, facilitating job matching and addressing workforce challenges. The Hukoomi portal also integrated OpenAI GPT to streamline government interactions and enhance operational efficiency

- **AI Investment**: Qatar's investments in the AI sector have picked up and are expected to rise further. A $2.5 billion incentive package was announced in May 2024 to boost investment in AI and digital innovations. The Qatar Investment Authority (QIA) also publicly stressed its continued focus on more AI-related investments in fields such as data centers, data categorization, software applications and semiconductors. Moreover, the Qatari multinational telecom company Ooredoo has secured a landmark QR 2 billion financing deal in September 2024 to accelerate the growth of its data center and AI business, with the aim to build 120MW data center capacity in five years. The company also has an ongoing partnership with Nvidia to develop AI-ready platforms for its clients across MENA.
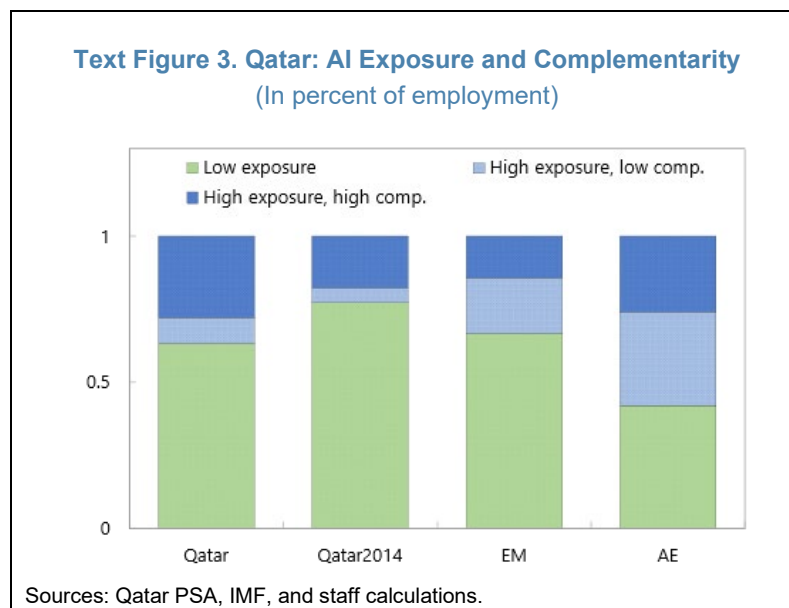
4.   **While active efforts have positioned Qatar ahead of its EM peers in AI readiness, there is still room for improvement compared to advanced economies.** In terms of digital access, Qatar's digital infrastructure, quality and affordability are relatively advanced and comparable to those in AEs. These advantages, if utilized well, can empower the country for accelerated AI adoption. While digital knowledge in Qatar still lags that in its GCC peers and AEs (Figure 2, panel 1), the Digital Agenda has laid out several digital talent programs aiming to improve the talent gap. In terms of AI readiness, according to Oxford Insights, Qatar is outperforming AE average in government vision and data representativeness, close to AEs on digital capacity, infrastructure and human capital, but with gaps in data availability, governance and ethics, adaptability, maturity and innovation capacity (Figure 2, panel 2).

Text Figure 2. Qatar: Digital Access and AI Readiness

Enhanced Digital Access
(Index, higher = better)

Government AI Readiness Index
(Index, higher = better)

Sources: Forthcoming "Digital Transformation in the GCC Economies" (Fareed, et al. 2024), Oxford Insights, and IMF staff calculations.

B. Impact of AI Adoption on Qatar's Labor Market

5. **The economic impacts of AI are multifaceted and transformative.** Literature identifies two main aspects of AI's impact on the labor market: productivity gains and job displacement risk. The extent of these gains or losses remains uncertain, contingent on the pace of AI technology upgrade, adoption by the economy and workforce readiness (Comunale and Manera, 2024). This analysis examines Qatar's labor force preparedness to AI using the analytical framework developed by Felten et al. (2021) and Pizzinelli et al. (2023), which evaluates AI's impact by combining occupational exposure to AI and complementarity by AI: jobs with high AI exposure but low complementarity would entail job displacement risk, whereas jobs with high AI exposure and high complementarity are likely to benefit from productivity and wage gains.

6. **Staff analysis shows that Qatar's increased AI exposure is likely to bring more opportunities than risks.** As of 2023, around 37 percent of Qatar's labor force see their jobs exposed to AI applications, representing an 18-percentage-point increase from 2014. The AI exposure level is comparable to the EM average (33 percent) but lower than the AE average (58 percent) (Figure 3). Among jobs with high exposure to AI, more than 75 percent also has high 'complementarity' with AI—that is, workers in those jobs will likely find AI helpful to their work and benefit from increased productivity instead of being replaced. Examples of high AI exposure and high complementarity jobs include business executives, engineers, and health professionals (see Annex 1). Qatar's position in labor force AI preparedness (defined as the ratio of high complementarity jobs within the high AI exposure group) is strong (75 percent) when compared to the averages of EM (43 percent) and AE (45 percent).
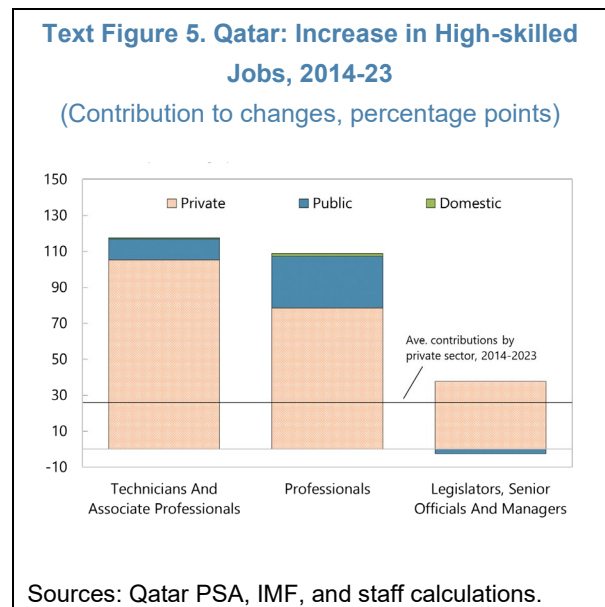

Text Figure 3. Qatar: AI Exposure and Complementarity
(In percent of employment)

Sources: Qatar PSA, IMF, and staff calculations.

7.   Qatar's strong position in the labor force AI preparedness is the result of efforts to create more high-skilled jobs, with the private sector playing a key role. In fact, all high-skilled occupations - managers, professionals, and technicians – fall in the high-AI exposure-high-complementarity territory (Figure 4). Over the past decade, the share of these high-skilled occupations has increased by 10 percentage points in Qatar. The private sector has been the main driver of Qatar's expanding high-skilled workforce. From 2014 to 2023, Qatar's total workforce increased by 30 percent, while the share of high-skilled, AI-benefiting occupations recorded a much higher growth of 87 percent on average, driven mainly by private sector employment (Figure 5).
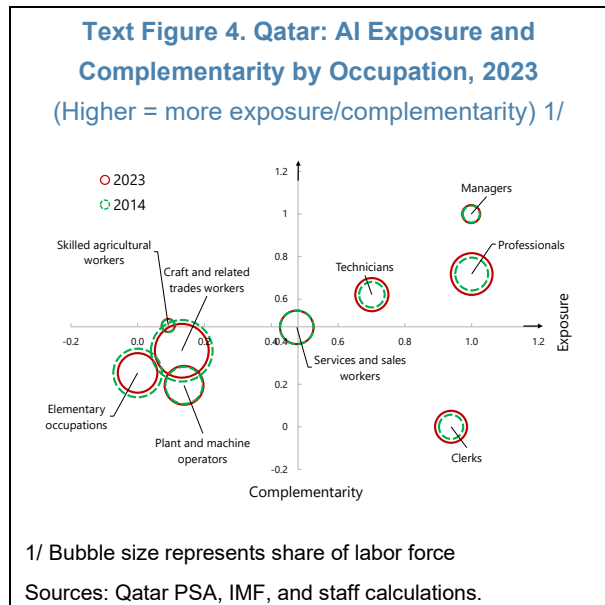
8.   The Qatari national workforce, mostly employed in the public sector, faces much higher AI exposure, which could lead to larger potential gains but also job displacement risks. The breakdown of workforce AI exposure by nationality shows that about 93 percent of Qatari workers have jobs exposed to AI, much higher than that among non-Qatari workers (33 percent) (Figure 6, panel 1). Among the high AI-exposure jobs held by Qatar nationals, 65 percent has high AI-complementarity, suggesting opportunities to benefit from AI-driven productivity gains. On the other hand, there is also a sizeable share of jobs held by Qatari nationals that are at risk of being replaced by AI (35 percent). These mainly constitute of clerical support workers (e.g., general office clerks, numerical clerks, and material recording and transport clerks). Data on employment and education status suggests that over 80 percent of the Qatari clerical workers are employed by the public sector and 75 percent of them hold a secondary degree (Figure 6, panel 3). As Qatar deepens government digitalization/AI adoption to enhance efficiency, proactive labor market policies are needed to mitigate job displacement risks for those vulnerable to AI adoption (see policy discussions below).

Text Figure 4. Qatar: AI Exposure and Complementarity by Occupation, 2023
(Higher = more exposure/complementarity) 1/

1/ Bubble size represents share of labor force
Sources: Qatar PSA, IMF, and staff calculations.

Text Figure 5. Qatar: Increase in High-skilled Jobs, 2014-23
(Contribution to changes, percentage points)

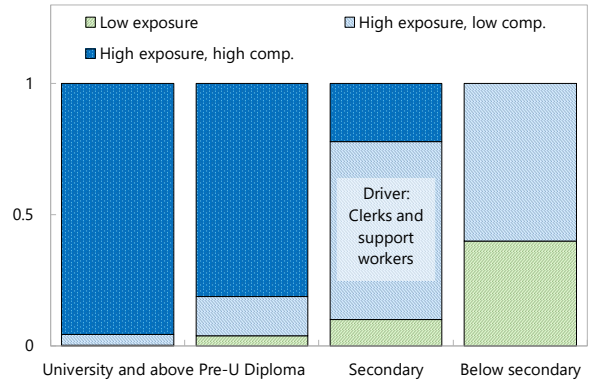Sources: Qatar PSA, IMF, and staff calculations.

Text Figure 6. Qatar: Labor Force AI Exposure by Gender, Nationality, Education and Age Group
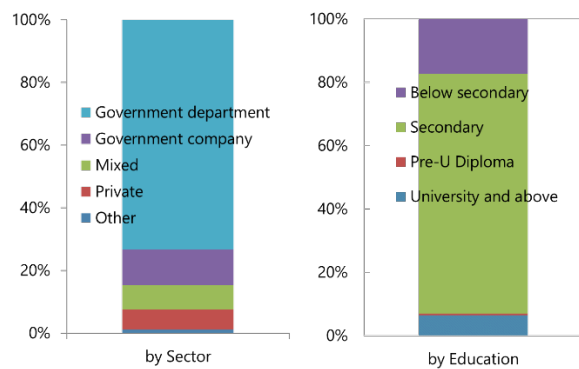
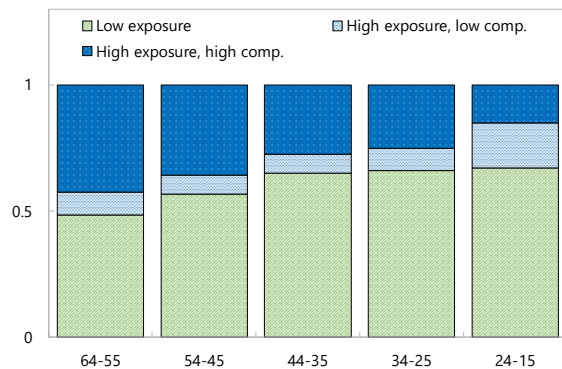**AI Exposure by Nationality and Gender**
(Share of employment)
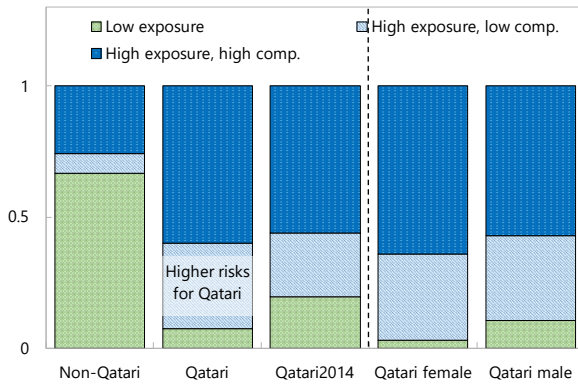
AI Exposure by Education Level in Qatari Workforce
(Share of employment)

Qatari Clerical Workers by Sector and Education
(Share of total)

AI Exposure by Age Group
(Share of employment)

Sources: Qatar PSA, IMF, and staff calculations.

C. Estimating the Impact of AI Adoption on Qatar's Labor Productivity

9.   **It is widely believed that AI adoption has the potential to boost productivity, but estimates of AI-driven gains vary and are highly context-dependent.** Estimates from existing literature such as firm-level studies have shown increases in productivity, with some reporting gains of up to 6.8% in sales per worker for AI-adopting companies. Private sector analyses such as Goldman Sachs project that AI could add between 0.3 and 3 percentage points to annual productivity growth, depending on the speed and scale of AI adoption. In emerging markets and developing economies (EMDEs), these gains are expected to be lower, with estimates ranging from 0.7 to 1.3 percentage points, reflecting the dominance of sectors with lower AI exposure, such as agriculture (Comunale and Manera, 2024). Overall, while AI has the potential to boost productivity, the magnitude of these gains remains uncertain and highly context dependent.

10.   **Against this backdrop, a scenario analysis has been deployed to estimate the impact of AI adoption on Qatar's labor productivity.** The impact of AI on labor productivity, which is defined as gross value added per worker, depends on the speed of global AI technology advancement, the country's labor force

exposure to AI and the speed of AI adoption in the country. The analysis starts with a Baseline Scenario which underpins staff's macroeconomic projections for Qatar over the next five years, where gains from comprehensive reforms (e.g., in enhancing human capital, business environment, private sector growth, and deepening AI penetration) are assumed to gradually lift labor productivity. Three additional scenarios are built around the baseline to estimate the impact of AI adoption at different paces, leveraging estimates of global AI productivity impacts from the existing literature and Qatar's labor force exposure to AI.

(i) A Pessimistic Scenario assuming lower-bound global AI productivity impact and a below historical trend increase in Qatar's AI exposure (+4 ppts cumulatively by 2030) and penetration.

(ii) An Optimistic Scenario leveraging upper-bound productivity impact estimates and sustained gains in Qatar's AI exposure in line with the historical trend (+7 ppts cumulatively by 2030) and penetration.
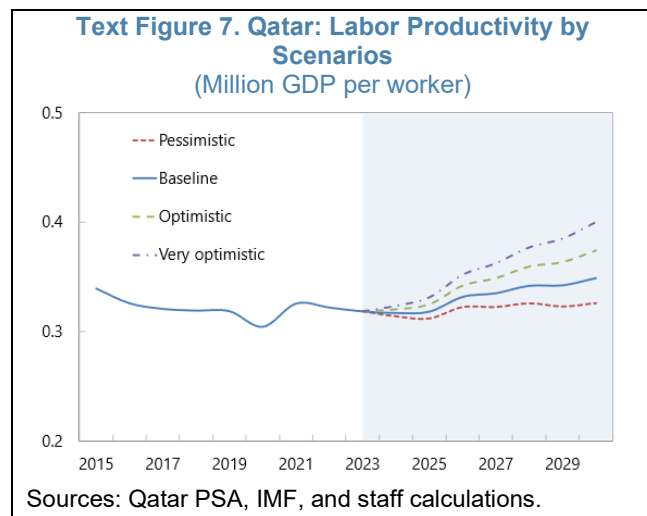
(iii) A Very Optimistic Scenario utilizing top-range global AI productivity impact and very fast increase in Qatar's AI exposure (+11 ppts cumulatively by 2030, reaching an average AE's AI exposure in 2023) and penetration.

For each scenario, we estimate the potential AI-driven productivity boost using the AI exposure metrics in Qatar and the intensity of AI productivity impacts reported globally, based on the formula as follows:

Estimated Productivity Boost = Qatar's AI Exposure and Penetration × Global AI Development and Productivity Impact

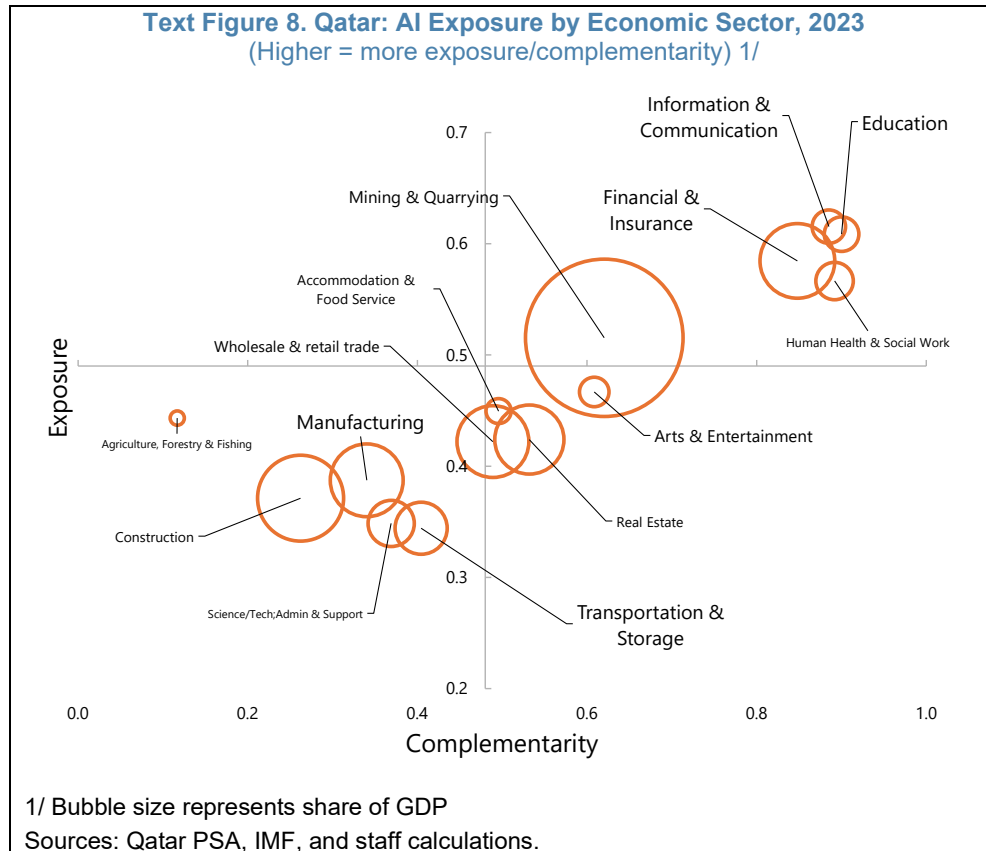**11.   The scenario analysis suggests that successful AI adoption could generate considerable gains in labor productivity.** With the focus on private sector growth, continued investment in human capital and efforts to attract high-skilled expatriates, Qatar's labor force may enjoy more opportunities than risks. Combining existing estimates of global AI productivity impacts and domestic reform gains (to increase AI exposure and deepen AI penetration), the optimistic scenario suggests that Qatar's labor productivity growth could be lifted by an additional 1 percentage point annually (above the baseline scenario). The three different scenarios point to potential labor productivity growth differential (from the baseline) ranging from -0.8 (under the pessimistic scenario) to 1.7 (under the very optimistic scenario) percentage points.

Text Figure 7. Qatar: Labor Productivity by Scenarios
(Million GDP per worker)

Sources: Qatar PSA, IMF, and staff calculations.

12.   Several NDS3 "enabling clusters" are well positioned to harness AI-driven productivity gains. The NDS3 identifies IT & Digital, Financial Services, and Education as the 'enabling clusters' that support diversification efforts. By matching the occupational composition of each economic sector in Qatar with the AI exposure-complementarity matrix, we find that the 'enabling' sectors concentrate in the high AI exposure and complementarity quadrant (Figure 8), indicating that they are better positioned, compared to other sectors, to

benefit from productivity gains from AI adoption. In contrast, key 'growth clusters' identified in NDS3, such as Manufacturing, Logistics, and Tourism have limited exposure to AI and hence remain largely shielded from both risks and opportunities related to the technology.

Text Figure 8. Qatar: AI Exposure by Economic Sector, 2023
(Higher = more exposure/complementarity) 1/

1/ Bubble size represents share of GDP
Sources: Qatar PSA, IMF, and staff calculations.

D. Conclusions

13.   Overall, Qatar is well positioned to benefit from AI-boosted productivity gains. The country's proactive approach in enhancing digitalization and embracing AI have bolstered its digital access and AI readiness, facilitating a rapid increase in AI exposure and labor force AI preparedness. The country's increased AI exposure is expected to bring more AI-driven productivity gains than risks. Its expatriate-dominated labor structure also allows the country more flexibility in adjusting its labor force for swifter AI adoption.

14.   The private sector plays a critical role in advancing AI adoption, creating job opportunities that align with AI's transformative potential. Private sector's dynamism is pivotal in generating high-skilled employment that could better leverage AI, thereby contributing to future productivity gains. Estimates suggest that further AI adoption in Qatar could significantly boost productivity, with potential gains varying based on factors such as speed of adoption and labor force exposure. However, it is important to recognize that despite the overall advantageous position of Qatari workers, those who are employed in the public sector with clerical positions are more susceptible to job displacement risks associated with AI.

15.   Efforts to deepen digitalization and AI adoption should strengthen with policies in place to address potential job displacement risks. The government could enhance digital skills of the labor force through targeted upskilling and reskilling programs and digital talent attraction schemes for expatriate workers, facilitate job transition including from the public to the private sector to mitigate job displacement risks, and develop adequate and well-targeted social safety nets to support vulnerable groups.

References

Comunale Mariarosaria, and Andrea Manera (2024). *The Economic Impacts and the Regulation of AI: A Review of the Academic Literature and Policy Actions.* IMF Working Paper WP/24/65, International Monetary Fund, March 2024.

Felten, E., Raj, M., & Seamans, R. (2021). Occupational, industry, and geographic exposure to artificial intelligence: A novel dataset and its potential uses. Strategic Management Journal, 42(12), 2195–2217.

Goldman Sachs. "Generative AI Could Raise Global GDP by 7 Percent." *Goldman Sachs Insights*, 2024. https://www.goldmansachs.com/insights/articles/generative-ai-could-raise-global-gdp-by-7-percent.

Qatar Ministry of Communications and Information Technology. *National Digital Agenda 2030 (NDA).* https://www.mcit.gov.qa/en/nda.

PwC. *The Potential Impact of Artificial Intelligence in the Middle East.* https://www.pwc.com/m1/en/publications/potential-impact-artificial-intelligence-middle-east.html.

Qatar Planning and Statistics Authority. *National Development Strategy 2024–2030 (NDS-3).* https://www.psa.gov.qa/en/nds1/pages/default.aspx.

Pizzinelli, Carlo, Augustus Panton, Marina M. Tavares, Mauro Cazzaniga, and Longji Li. (2023) *Labor Market Exposure to AI: Cross-country Differences and Distributional Implications.* IMF Working Paper WP 23/216, International Monetary Fund, October 2023.

Stanford University. *AI Index Report 2024.* Stanford Institute for Human-Centered Artificial Intelligence. https://aiindex.stanford.edu/report/

Annex I. ILO - International Standard Classification of Occupations 2008

major	major_label	sub_major	description
1	Managers	11	Chief Executives, Senior Officials and Legislators
		12	Administrative and Commercial Managers
		13	Production and Specialized Services Managers
		14	Hospitality, Retail and Other Services Managers
2	Professionals	21	Science and Engineering Professionals
		22	Health Professionals
		23	Teaching Professionals
		24	Business and Administration Professionals
		25	Information and Communications Technology Professionals
		26	Legal, Social and Cultural Professionals
3	Technicians and Associate Professionals	31	Science and Engineering Associate Professionals
		32	Health Associate Professionals
		33	Business and Administration Associate Professionals
		34	Legal, Social, Cultural and Related Associate Professionals
		35	Information and Communications Technicians
4	Clerical Support Workers	41	General and Keyboard Clerks
		42	Customer Services Clerks
		43	Numerical and Material Recording Clerks
		44	Other Clerical Support Workers
5	Services And Sales Workers	51	Personal Services Workers
		52	Sales Workers
		53	Personal Care Workers
		54	Protective Services Workers
6	Skilled Agricultural, Forestry and Fishery Workers	61	Market-oriented Skilled Agricultural Workers
		62	Market-oriented Skilled Forestry, Fishery and Hunting Workers
		63	Subsistence Farmers, Fishers, Hunters and Gatherers
7	Craft and Related Trades Workers	71	Building and Related Trades Workers (excluding Electricians)
		72	Metal, Machinery and Related Trades Workers
		73	Handicraft and Printing Workers
		74	Electrical and Electronics Trades Workers
		75	Food Processing, Woodworking, Garment and Other Craft and Related Trades Workers
8	Plant and Machine Operators and Assemblers	81	Stationary Plant and Machine Operators
		82	Assemblers
		83	Drivers and Mobile Plant Operators
9	Elementary Occupations	91	Cleaners and Helpers
		92	Agricultural, Forestry and Fishery Labourers
		93	Labourers in Mining, Construction, Manufacturing and Transport
		94	Food Preparation Assistants
		95	Street and Related Sales and Services Workers
		96	Refuse Workers and Other Elementary Workers